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Thinking Like A Nurse: The Impact Of Simulation And Clinical Experiences On Clinical Judgment In Prelicensure Nursing Students

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THINKING LIKE A NURSE:
THE IMPACT OF SIMULATION AND CLINICAL EXPERIENCES
ON CLINICAL JUDGMENT IN PRELICENSURE NURSING STUDENTS

by

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Bachelor of Arts, College of St. Catherine, 1982
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A Dissertation

Submitted to the Graduate Faculty

of the

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In partial fulfillment of the requirements

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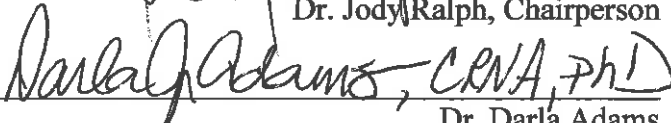
2016

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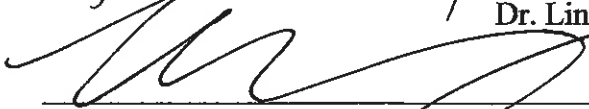
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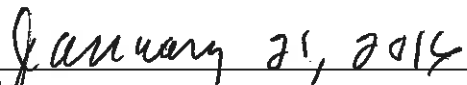


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This dissertation is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies at the University of North Dakota and is hereby approved.



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Dean of the School of Graduate Studies



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PERMISSION

Title Thinking like a nurse: The impact of simulation and clinical experiences
on clinical judgment in prelicensure nursing students

Department College of Nursing and Professional Disciplines

Degree Doctor of Philosophy

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Carol Ann Reid

December 8, 2015

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ABSTRACT

Introduction: The ability to make sound clinical judgments is essential to safe nursing practice. Clinical experiences allow nursing students to integrate theory and practice and demonstrate clinical judgment. Simulation is being used by nursing programs to replace clinical experiences. Limited research is published regarding the effectiveness of simulation in the development of clinical judgment. This study explored differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation or hospital-based clinical experiences.

Methods: This study used Lasater's Clinical Judgment Rubric (LCJR), based on Tanner's Clinical Judgment Model, to evaluate nursing students' clinical judgment following completion of simulation or hospital-based clinical experiences. The model includes four dimensions: noticing, interpreting, responding and reflecting. The LCJR catalogues the behaviors associated with each dimension of clinical judgment. Participants were students registered for a maternal-newborn clinical course at prelicensure nursing programs in the Midwest. Students completed simulation or clinical experiences as scheduled by the program. Following completion of the clinical rotation, each student participated in an evaluative high-risk maternal-newborn simulation. Evaluative simulation experiences were recorded. Recordings were viewed and evaluated using the LCJR. LCJR scores were calculated, associations between mean LCJR scores for each group were examined using an independent sample t-test. Data were analyzed to

determine if there were any associations between demographic characteristics and clinical judgment scores.

Results: There was no statistically significant difference in clinical judgment for nursing students participating in simulation as compared to hospital-based clinical experiences ($t = -1.056, p = 0.295$). Of the demographic variables analyzed, race/ethnicity and current employment explained significant variance in clinical judgment. White, non-Hispanic participants scored higher compared to African-Americans ($t = -4.539 p < 0.001$) and other ethnicities ($t = -2.449 p = 0.018$). Employed participants scored lower ($t = -2.044, p = 0.046$) than unemployed participants. This study provides evidence that replacing clinical experiences with simulation is effective in the maternal-newborn clinical area under conditions comparable to this study.

CHAPTER I

INTRODUCTION

There is an expectation that all nurses are able to act appropriately, and in a timely fashion in clinical situations. Further, graduate nurses entering the workforce must be able to make a smooth transition to the practice setting in order to work effectively and collaboratively with other health professionals in an effort to provide safe, quality, patient-centered care (Institutes of Medicine [IOM], 2011). Within the hospital setting, nurses must make critical clinical judgments associated with the care of individuals who are frail and have complex health needs (IOM, 2011). Recommendations from the Institutes of Medicine (IOM, 2011) include providing nurses with the tools necessary to promote safe, quality patient centered care, while continuing to provide ethical, holistic, compassionate approaches to care. Nursing education programs should ensure graduates are able to respond to and manage complex care situations and coordinate with multiple professionals. To that end, nursing education must change significantly in order to meet the needs of individuals and families as the health care system in the United States undergoes drastic transformation (Benner, Sutphen, Leonard, & Day, 2009; IOM, 2011).

Research Problem

Many professional nursing programs are facing challenges providing adequate clinical learning opportunities for students. The availability of clinical experiences in specialty areas such as pediatrics, maternal-newborn (obstetrics) and mental health is

grossly inadequate (Harrison, 2004; Hutchings, Williamson, & Humphreys, 2005; IOM, 2011; Pauly-O'Neill, Prion, & Lambton, 2013). In addition, increased patient acuity, shorter inpatient stays and diminished staffing have caused many clinical site managers to limit the frequency of clinical groups and the number of students allowed on the unit at any given time (Pauly-O'Neill et al., 2013).

Current clinical experiences in hospital-based settings are fewer in number and shorter in length than in years past, impeding the nursing students' ability to experience more complex situations in which to exercise clinical judgment. Maternal-newborn, pediatrics and mental health clinical opportunities are even more difficult to secure. Alternatives that provide comparable opportunities to learn and demonstrate clinical judgment, such as the use of simulation, need to be explored.

A Solution: Replacing Clinical with Simulation

Limited access to clinical sites and the need for graduates to be able to care for acutely ill patients has prompted nursing programs to implement alternative learning strategies to allow students opportunities to provide nursing care to patients in various states of health. Several studies have proposed replacing clinical experiences with clinically realistic simulation using high-fidelity human patient simulators (Bradley, 2006; Hyland & Hawkins, 2009; Jacobson & Grindel, 2006; Jeffries, 2005; Scherer, Bruce, Graves, & Erdley, 2003; Schlairet & Pollock, 2010; Tanner, 2006a). This type of simulation is "a technique, not a technology, to replace or amplify real patient experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" (Gaba, 2007, p. 126). Incorporating clinically realistic simulation in nursing education may address the

inadequacy of clinical placements and provide students with opportunities to demonstrate clinical judgment (IOM, 2011).

Simulation in prelicensure nursing education is proving to be a successful teaching strategy, preferred by many nursing students and faculty (Hovancsek, 2007; Hyland & Hawkins, 2009; Kardong-Edgren, Willhaus, Bennett, & Hayden, 2012; Kuznar, 2007). Nehring (2008) reported the United States Boards of Nursing support the use of simulation as a "critical element of nursing education" (p. 109). There is significant information in the simulation literature about student perceptions of learning, confidence and preferences for integrating simulation into curricula (Cato, Lasater, & Peeples, 2009; Coiffi, Purcal, & Arundell, 2005; Foronda, Liu, & Bauman, 2013; Harder, 2010; Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005; Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010; Wilford & Doyle, 2006). In several studies, students reported increased satisfaction, enhanced confidence, increased knowledge and improved clinical judgment following simulation (Bambini, Washburn, & Perkins, 2009; Blum, Borglund, & Parcels, 2010; Brown & Chronister, 2009; Jeffries & Rizzolo, 2007; Schlairet, 2011). Other studies provide similar evidence that simulation can be used to promote clinical judgment (Cant & Cooper, 2009; Decker, Sportsman, Puetz, & Billings, 2008; Harder, 2010; Lapkin et al., 2010).

Prelicensure programs are replacing clinical experiences with simulation (Hayden, 2010; Kardong-Edgren et al., 2012). As a practice profession with deep roots in apprentice training, little evidence exists to support the use of simulation to replace traditional clinical experiences. To that end, the National Council of State Boards of Nursing to conduct a study of the effects of replacing clinical hours with simulated

clinical experiences integrated throughout the prelicensure nursing curriculum. The researchers concluded that participating in simulation for up to 50% of clinical experiences provided similar end of program outcomes and preparation for clinical practice (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014).

Advantages and disadvantages of the use of simulation have been identified. Advantages include integration of learning from the classroom, assigned reading, skills lab and clinical; ability to see the outcome of an intervention; and the breadth of clinical experiences available. Disadvantages included imprecise simulator; environmental and psychological fidelity (unrealistic manikin facial expressions, and reflexes); required cost and time commitments for equipment, faculty and training; and lack of empirical evidence supporting integration into curricula (Decker et al., 2008; Fisher & King, 2013; Gaba, 2004; Jeffries, 2014; Lasater, 2007b; Spector, 2009; Wolfgram & Quinn, 2012). By design, simulations can mimic clinical experiences and provide nursing students the opportunity to be involved and perform in the role of the professional nurse. Simulation is a means to provide nursing students with the opportunity to develop and demonstrate clinical judgment in an environment that is realistic and risk to patients is low (Fisher & King, 2013; Jeffries, 2005; Jeffries, 2014; Lindsey & Jenkins, 2013).

Nursing programs have made the investment of faculty time and equipment necessary to incorporate simulation in the curriculum, and most faculty and students view it as a promising strategy (Lapkin et al., 2010). It is time to identify best practices in simulation and clinical education and to determine the learning strategies that promote clinical judgment in nursing education (Akhtar-Danesh, Baxter, Valaitis, Stanyon, & Sproul, 2009).

Clinical Judgment

The terms clinical decision making, clinical judgment, critical thinking, clinical reasoning and problem solving have all been used in nursing literature discussing clinical judgment. Determining the distinctions between the terms requires attention to the detailed process of decision-making. Critical thinking is a general term used to describe the process of analyzing knowledge (Benner, 1984). It is not discipline specific (Simpson & Courtney, 2002; Victor-Chmil, 2013). Facione (1990) found that while critical thinking has application in all areas of life, and transcends specific subjects, discipline specific knowledge is important to making reasonable clinical judgments in those specific environments. Clinical reasoning is the cognitive and metacognitive processes used for analyzing knowledge relative to a clinical situation or specific patient (Banning, 2008). Clinical reasoning is specific to healthcare disciplines and refers to:

the processes by which nurses and other clinicians make their judgments, and includes both the deliberate process of generating alternatives, weighing them against the evidence, and choosing the most appropriate, and those patterns that might be characterized as engaged, practical reasoning (Tanner, 2006b, p. 204).

Finally, clinical judgment is required in clinical situations that are complex and ambiguous, often having competing values and interests and involving not only the nurse and patient, but often the family and significant others as well (Ebright, Patterson, Chalko, & Render, 2003). Clinical judgment refers to “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” (Benner, Tanner, & Chesla, 1996, p. 2). These related concepts: critical thinking, clinical reasoning, and clinical

judgment, represent a process that leads “the nurse to sound evidence-based practice” (Victor-Chmil, 2013, p. 34).

Clinical judgment is an essential skill for every nurse and is the basis of actions taken by the nurse. Nursing clinical judgment must begin early during nursing education and be developed as a student progresses to thinking “like a nurse” (Tanner, 2006b). Clinical judgment is based on information from the situation at hand, as well as the knowledge and experience gained in the past. Actions and responses to the situation are based on the integration of the situation and the knowledge and experience of the nurse. Opportunities to practice clinical judgment, the resulting actions and evaluation are necessary to solidify the knowledge and gain experience. In nursing education these opportunities occur most often in the clinical setting (Nehring, 2008), adding to the challenge when clinical opportunities are limited.

Development of clinical reasoning skills and clinical judgment is demonstrated in the students’ ability to integrate previous experiences, knowledge and skills in order to implement nursing care in new or unfamiliar clinical situations. Effective clinical judgment results in positive patient outcomes, whereas poor clinical judgment may lead to inability to detect salient information such as patient deterioration, and lead to poor patient outcomes such as failure to rescue (Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Benner et al., 1996).

Theoretical Framework

Introduction

Tanner’s Clinical Judgment Model (Tanner, 2006b) was utilized as a framework for this study. Tanner (2006b) proposes a model of clinical judgment that includes four

dimensions: noticing, interpreting, responding and reflecting (see Figure 1). Through these four dimensions, the nurse identifies the concern and intervenes to facilitate achievement of the goals set between the nurse and the patient.

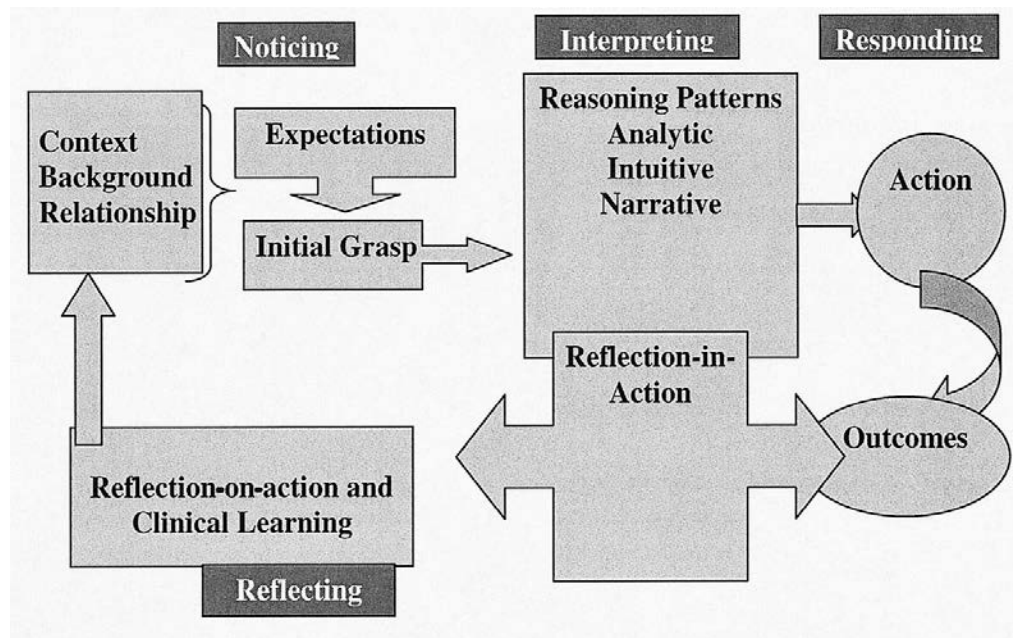


Figure 1. Tanner's Clinical Judgment Model
 Reprinted from “Thinking like a nurse: A research-based model of clinical judgment in nursing” by C. A. Tanner, 2006, *Journal of Nursing Education*, 45, p. 208. Copyright 2006 by SLACK INCORPORATED. Reproduced with permission.

Dimensions of Clinical Judgment

Each dimension of clinical judgment includes several characteristics. *Noticing* is the “perceptual grasp of the situation at hand” (Tanner, 2006b, p. 208). It evolves from the nurse's expectations of the situation based on knowledge of the patient and the patient’s patterns of response, clinical knowledge from experience, and knowledge from more formal education. The values of the individual nurse related to the patient's situation, as well as the nursing unit, also shape the nurse's noticing. Noticing triggers

reasoning patterns that support the nurse's interpretation of the data and helps determine the course of action (Tanner, 2006b).

Interpreting occurs when the nurse develops a sufficient understanding of the situation in order to decide on a course of action appropriate for the situation (*Responding*). The nurse's knowledge and values also weigh heavily during *Interpreting* and *Responding*. The nurse may bring to the situation scientific knowledge as well as experiences and knowledge of a non-scientific nature. Experienced nurses encountering a situation are able to relate it to the familiar, recall knowledge, and respond quickly with an intervention. Compared to experienced nurses, beginning nurses, including student nurses rely more heavily on scientific knowledge than experience to make clinical judgments, and this reasoning process may be more drawn out. They may fail to notice slight differences and may apply their limited experiences to a new situation that may not lead to an appropriate intervention. The patient's response to the intervention will either support or challenge the clinical judgment and subsequent intervention (Tanner, 2006b).

Interpreting and responding are facilitated by three patterns of reasoning used most often by experienced nurses: analytic, intuition and narrative thinking (Tanner, 2006b). Nurses use reasoning patterns alone or in combination. The nurse may recognize a pattern immediately, responding quickly and intuitively. In other situations, the nurse may need to consider several hypotheses, talk through the possible outcomes, and compare the patient response to the knowledge and assessment findings until the nurse determines an appropriate intervention. It is uncommon for a nurse to use only one pattern in a particular patient interaction. As a result, the nurse assesses and intervenes as a means of interpreting and responding to what has been noticed (Tanner, 2006b).

Reflection, occurs both during and after the situation, and is a significant aspect of this model. Reflection during the situation (*reflection-in-action*) is the nurse's ability to read the patient's responses to interventions and adapt future interventions based on the assessment findings. Reflection that occurs after the situation (*reflection-on-action*) adds to the nurse's experience and supplements the clinical knowledge base. Reflection requires a sense of responsibility on the part of the nurse; the ability and desire to connect the actions taken with the outcome and being able to determine what occurred as a result of the nursing interventions implemented or actions taken. Reflection-on-action is often triggered by breakdown in clinical judgment and is critical for the development of clinical knowledge and improvement in clinical reasoning (Tanner, 2006b). Reflection-on-action drives the nurse to review the situation in depth, including the nurse's response and desire to learn from the perceived mistakes. Using the four aspects of this model, noticing, responding, interpreting and reflecting, the nurse identifies the concern and intervenes to facilitate achievement of the goals set between the nurse and the patient.

For example, a nurse is assigned to care for a patient who gave birth the previous day. Assessments include vital signs, patient report of pain on a standard pain rating scale, blood loss, and observations of the patient during activity (*Noticing*). Integrating information from the medical record such as age and gender of the patient, type of delivery, length of labor; knowledge of patients with similar labor and delivery experiences; knowledge of this patient from previous encounters; and theoretical knowledge related to the delivery method, vital signs, pain, and expected activity tolerance, the nurse determine the patient is in moderate pain (*Interpreting*). The nurse offers the patient several pharmacologic and non-pharmacologic pain management

alternatives. Based on the alternatives available, the patient's medical diagnosis and the patient response, the nurse immediately provides an ice pack and repositions the patient (*Responding*). The patient reports some comfort immediately from these interventions (*Reflection-in-action*). The nurse prepares and administers the maximum dose of pain medication, ordered every 4 hours as needed, following the facility protocol (*Responding*). Thirty minutes later, the patient is dozing in bed and reports significant relief of pain. One hour later, the patient attends a scheduled group teaching session. Following the teaching session, the patient reports she was sleepy and not able to fully participate in the session. The nurse considers the actions taken to relieve the pain, including the timing and dose of the medication given, as well as alternative pain relief measure that were or could have been implemented (*Reflection-on-action*). This experience may be part of the process of clinical judgment for subsequent patient care situations.

Purpose

The purpose of this study is to determine if there are differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation as compared to hospital-based clinical experiences. This research study is designed to answer the following specific aims: (1) Are there differences in nursing students' clinical judgment in an evaluative simulation following participation in simulated maternal-newborn experiences as compared to hospital-based maternal-newborn clinical experiences? (2) Which of the following demographic characteristics (age, gender, race/ethnicity, type of nursing program attending, current employment status, highest degree earned, experience with pregnancy or childbirth outside nursing

program requirements, and grade in didactic maternal-newborn course) are associated with clinical judgment scores in the evaluative simulation?

Context of Nursing Education

Prelicensure Professional Nursing Education

All states and the District of Columbia require nurses to be licensed to practice. An individual must provide proof of graduation or eligibility for graduation from a professional nursing program approved by a member Board of Nursing to be eligible to take the standardized National Council Licensure Examination for registered nurses (NCLEX-RN) (National Council of State Boards of Nursing [NCSBN], 2012).

There are several professional nursing educational paths leading to eligibility to take the standardized National Council Licensure Examination (NCLEX)-RN: baccalaureate degree in nursing (BSN/BAN), associate degree in nursing (ADN/ASN), master's degree for non-nursing college graduates (entry-level/2nd degree master's) nursing programs, or a diploma from an approved nursing program (American Nurses Association, 2015; Bureau of Labor Statistics, 2014).

- Associate degree in nursing programs require at least two academic years of full-time equivalent college academic work and award an associate degree in nursing (Fang, Li, & Bednash, 2013). In 2014, there were a total of 1092 associate degree programs, comprising 58% of the total programs in the United States (National League for Nursing [NLN], 2015).
- Generic (basic or entry-level) baccalaureate nursing programs admit students with no previous nursing education and award a baccalaureate nursing degree. Programs require at least four but not more than five academic years of full-time college

academic work (Fang, Li, & Bednash, 2013). In 2014, there were a total of 710 baccalaureate degree programs, comprising 38% of the total programs in the United States (NLN, 2015).

- Master's for non-nursing college graduates (entry-level/2nd degree master's) nursing programs admit students with baccalaureate degrees in disciplines other than nursing and no previous nursing education, prepares graduates for entry-level positions, and awards a master's degree in nursing. In 2013, there were 67 schools in the United States offering the entry-level/2nd degree master's programs (Fang, Li, & Bednash, 2013).
- Diploma in nursing is available through hospital-based schools of nursing. Once the most common route to Registered Nursing licensure, less than 10 percent of all basic professional nursing education programs are 3 year hospital-based diploma programs (American Association of Colleges of Nursing [AACN], 2015).

Hospital-based Clinical Experiences

Traditionally, clinical experiences in nursing education consist of a small group of students, supervised by a faculty member, caring for an assigned individual patient or patients on a specific hospital-based inpatient unit. Students are responsible for care of the assigned patient(s) during the specific care period. The student clinical groups move from one clinical site to another; students are often strangers to the co-assigned nurse assigned to provide patient care. Frequently, direct supervision by the clinical instructor is required, causing students to wait to perform skills, procedures and interventions for the assigned patient(s) (Niederhauser, MacIntyre, Garner, Teel, & Murray, 2011, p. 404).

Maternal-Newborn Nursing. Nursing programs are required by accrediting bodies to provide clinical experiences and activities with patients across the lifespan which are adequate to achieve the student learning outcomes and graduate competencies (Accreditation Commission for Education in Nursing [ACEN], 2013; American Association of Colleges of Nursing [AACN], 2013). This includes opportunities to provide care to individuals in the maternal-newborn clinical setting. Maternal-newborn nursing involves the care of the childbearing family, specifically providing care and education during pregnancy, birth, the neonatal and postpartum (birth to six weeks) periods. Nursing care for the family during this time includes physiological, psychological and sociocultural care and education. The nurse actively participates in assessing, developing, implementing and evaluating an individualized plan of care for the mother and neonate (National Council of State Boards of Nursing [NCSBN], 2013, p. 19).

Simulation

Simulation has a long history and has been used in several fields. In ancient times, jousting was a way for knights to hone and maintain skills for the battlefield. In more recent times, simulation has been adopted by aviation, National Aeronautics and Space Administration (NASA), the nuclear power industry and the military to train individuals to respond to low frequency, high risk events. The common thread in all these industries is that testing in the real world is costly and life threatening (Bradley, 2006; Cooper & Taqueti, 2004; Hamman, 2004; Nickerson & Pollard, 2010).

Healthcare simulation has a long history, as well (Cooper & Taqueti, 2004; Nehring & Lashley, 2009). In the early 1900s, Mrs. Chase was introduced to train

healthcare workers (Herrmann, 2008). The most well-known resuscitation simulator is Resusci-Anne®, first introduced in the mid-1900s (Laerdal, 2015a). Harvey®, used to teach bedside cardiac assessment skills was introduced soon after (Laerdal, 2015b). Anesthesia students have learned through simulation since 1969, when the first simulator that allowed endotracheal intubation was invented (Bradley, 2006; Peteani, 2004; Wilford & Doyle, 2006). Development of simulators continued, but widespread use did not occur until the 1980s due to high cost of production (Bradley, 2006; Brindley, Suen, & Drummond, 2007; Wilford & Doyle, 2006). Nursing simulation has been growing slowly since the mid-1980s. With the introduction of more complex, versatile, portable and affordable human patient simulators in the late 1990s, healthcare facilities began to use simulation as a way to help nursing, medical and ancillary personnel learn and maintain skills necessary for their positions (Sinclair & Ferguson, 2009) and for team building, communication and collaboration between and within professions (Decker et al., 2008).

However, healthcare simulation is more than just the technology of simulators. High-fidelity simulation is an attempt to reproduce essential components of a clinical situation to allow students to practice specific psychomotor, communication and decision making skills that are integral to safe patient care in an environment that enhances learning (Hovancsek, 2007).

Simulation Fidelity. Simulation attempts to reproduce the crucial characteristics of a clinical situation with a degree of reality that allows the participants to understand and manage a similar situation when it occurs for real in clinical practice (Morton, 1997, p. 76). Fidelity involves several components of realism: equipment, environment, and psychological fidelity (Dieckmann, Gaba, & Rall, 2007). Along a continuum lie low-

fidelity simulations, such as case studies or role playing; mid-range fidelity simulations, which use task trainers such as catheterization models and low or no-technology manikins or environment to practice specific psychomotor skills; and high-fidelity, clinically realistic simulations that employ technologically sophisticated equipment in a realistic physical and psychological environment.

High-fidelity, clinically realistic simulations provide a multi-dimensional experience for students to interact and make clinical judgments in a situation that replicates the clinical setting in a realistic, interactive manner (Jeffries & Rizzolo, 2007). While high-fidelity simulators such as SimMan[®], SimJunior[®] (Laerdal, 2015c), IStan[®] or MetiMan[®] (CAE Healthcare, 2015) are used in high-fidelity, clinically realistic simulations, there are other significant environmental factors that help create the realism for the scenario. These environmental factors may include supplies (IV catheters and fluids), equipment (monitoring devices, beds), and persons (family members, healthcare team members, etc.) that facilitate the realism of the simulated scenario (Jeffries, 2005).

Definitions

The following definitions will be used for the purposes of this study.

Clinical judgment is the nurse's observation and interpretation of patient concerns, needs or problems and the subsequent conclusions and decisions to respond or act “like a nurse” (Tanner, 2006b).

Professional nursing education program type will refer to baccalaureate and associate degree programs.

Maternal-newborn clinical will refer to those experiences providing nursing care of a mother and newborn during the first 48 hours of life.

Hospital-based clinical will refer to the experiences of students in a hospital setting with direct oversight by a clinical faculty.

Simulation is "a technique, not a technology, to replace or amplify real patient experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" (Gaba, 2007, p. 126).

Fidelity is an inherent property of simulation and is defined as "the degree of accuracy to which a simulation, whether it is physical, mental, or both, represents a given frame of reality in terms of cues and stimuli, and permissible interactions" (Tun, Alinier, Tang, & Kneebone, 2015, p. 164).

These terms will be used throughout this study, and will refer to the definitions as outlined above.

Delimitations and Assumptions

The nature of the simulation fidelity continuum and varying previous experiences with simulation may affect students' performance and clinical judgment in simulation. Attempts were made to provide clinical realism; however both equipment fidelity (how well the manikin responds), environmental fidelity (how closely the simulation environment matches the clinical setting), and psychological fidelity (how much the student believes the simulation is real) are not the same as reality. Errors in simulation are learning experiences and have no real-time consequences to patient safety. No matter how clinically realistic the simulation is designed, the student is required to "pretend" the manikin and other elements of the simulation are real.

The researcher assumed students engaged in the final evaluative simulation, and that student actions reflected student clinical judgments as though they were in a clinical

experience with a real person. However, the resulting score for clinical judgment may not reflect usual performance in the clinical setting for some students.

Significance

The need for graduates to be well prepared to provide safe, timely nursing care and the challenge to secure appropriate clinical sites and patient assignments within those sites leads nursing programs to consider replacing clinical experiences with simulation. Several studies have proposed replacing clinical experiences with clinically realistic simulation using high-fidelity human patient simulators (Bradley, 2006; Hayden et al., 2014; Hyland & Hawkins, 2009; Jacobson & Grindel, 2006; Jeffries, 2005; Scherer et al., 2003; Schlairet & Pollock, 2010; Tanner, 2006a). While it is widely accepted that simulation is an appropriate teaching strategy, there is little published empirical research comparing the effects of student participation in high-fidelity simulation with those of traditional, real-life, hospital-based clinical experiences.

At this time, few state Boards of Nursing have requirements related to simulation and clinical experiences within nursing programs (Hayden, Smiley & Gross, 2014; Nehring, 2008; Spector, 2009). As this teaching strategy is implemented in more nursing programs, state Boards of Nursing may begin to include requirements related to the use of simulation (Spector, 2009). Further evidence of the effectiveness of simulation as a replacement for hospital-based clinical hours in specialty areas is needed.

Ideally, opportunities to develop clinical judgment are provided in real-life healthcare situations in which nursing students fully participate in the role of the professional nurse. In reality, this does not occur due to the system and situational barriers mentioned. In addition, the complexity and unpredictability of the patients' care

needs (Ravert, 2002; Rhodes & Curran, 2005) and the ethical challenge of students “practicing” on patients (Bremner, Aduddell, Bennett, & VanGeest, 2006) limit the opportunities for nursing students to participate in situations in which clinical judgment may be learned.

Maternal-newborn clinical sites may be unfavorable learning environments. Challenges include perceived increase in the staff workload (Hathorn, Machtmes, & Tillman, 2009), gender bias against male students (Cudé & Winfrey 2007), patients refusal of being cared for by student nurses (Miller, 2014; Sittner, Hertzog, & Fleck, 2013) and the litigious environment unique to maternal-newborn and other high risk clinical areas (Mahlmeister, 2008). Clinical experiences in learning environments with these challenges may limit the development of clinical judgment.

There is a paucity of evidence related to how the clinical environment affects the development of clinical judgment skills. Evidence of the effectiveness of simulation as compared to hospital-based clinical experiences in developing clinical judgment, specifically in the maternal-newborn specialty area, is essential for improving learning environments for nursing students. In addition, nursing program administrators, faculty and regulatory bodies will have a stronger base of evidence for decisions about clinical experiences and implementation of simulation in nursing programs to reach a goal of facilitating entry level nurses with stronger skill sets and excellent clinical judgment skills resulting in safe patient care.

Summary

Nursing programs across the United States are challenged with finding sufficient, appropriate opportunities to integrate clinical placements and coursework as a result of

the shift from hospital-based programs to those housed in colleges and universities (IOM, 2011; Murray & Williamson, 2009). This separation of practice and academia has been beneficial for the profession, but has challenged educators seeking opportunities for nursing students to develop and hone knowledge, skills and competencies that are needed as they enter the workforce (Cronenwett & Redman, 2003; IOM, 2011). High-fidelity simulation may provide nursing students with clinical experiences that are more effective in promoting clinical judgment, offering a potential solution to the problem of limited opportunities in traditional clinical settings (Brindley et al., 2007; Harder, 2010). Little evidence is available that supports the use of simulation to replace clinical experiences in developing clinical judgment. This study investigated if there is a difference in clinical judgment among nursing students participating in high-fidelity simulation and those who participate in hospital-based clinical experiences in the maternal-newborn setting.

The next chapter of this dissertation will analyze the literature in the areas of clinical judgment, simulation and nursing education. Subsequent chapters will describe a method of studying clinical judgment in prelicensure nursing students participating in simulation will be described, results will be reported. Finally, the results and implications will be discussed.

CHAPTER II

REVIEW OF LITERATURE

Entry-level nursing students' feelings of competence and preparedness to provide safe and effective nursing care is dependent on the theoretical knowledge and clinical experiences they have gained. Clinical experiences provide students with the opportunity to integrate theoretical knowledge, skills, and critical thinking in order to demonstrate clinical judgment (McCallum, 2007). Replacing clinical experiences with simulation may allow students the opportunity to provide nursing care, thereby facilitating self-confidence and clinical competence in a low-risk, yet realistic environment. This chapter includes a review of the literature related to clinical judgment and the relationship between clinical experiences and clinical judgment development, benefits and obstacles related to clinical education and research evaluating the efficacy of simulation as a clinical learning strategy. This review of literature, the foundation for the research questions, is organized in the following section: clinical judgment, clinical experiences in nursing education, and evaluation of clinical judgment.

Clinical Judgment

The terms clinical decision making, clinical judgment, critical thinking, clinical reasoning and problem solving have all been used in nursing literature discussing clinical judgment. As discussed in the previous chapter, nursing actions in complex, ambiguous clinical situations result from a decision making process including critical thinking, clinical reasoning and clinical judgment (Ebright et al., 2003).

Decision Making Models

Clinical decision-making is a complex process. The decision-maker must gather and interpret information, group it in a meaningful way, integrate it with existing scientific and technical knowledge as well as knowledge of the patient, and formulate alternative diagnoses or actions. Once alternatives are identified, the decision-maker must review the hypotheses, recognize patterns, and identify the primary nursing concerns or priorities, and choose between alternative actions (Banning, 2008; Bittencourt & Crossetti, 2012; Bjork & Hamilton, 2011; Klein, 1999; Levett-Jones et al., 2010). Explanation of several models of decision making identified in the literature follows.

Information Processing Model. The information processing model, commonly used by health care providers to establish a medical diagnosis, uses a scientific, or hypothetico-deduction, decision making tree to determine potential outcomes. The potential outcomes are assigned a numeric value and the probability of an outcome is determined. This model has some applicability in nursing, however, some argue that nurses do not “diagnose”, making it an inappropriate model for use by nurses (Banning, 2008; Buckingham & Adams, 2000a).

Heuristics Model. Heuristics models are used by experienced nurses to facilitate reasoning. Heuristics are rules of thumb, mental shortcuts or methods for processing large amounts of information. Heuristics incorporate domain-specific knowledge and experience. Pattern recognition is a commonly used heuristic. As nurses become more experienced, they collect a repertoire of information considered to be critical to identify specific outcomes, allowing them to reach conclusions and determine actions that have

worked in the past (Buckingham & Adams, 2000b; Simmons, Lanuza, Fonteyn, Hicks, & Holm, 2003).

Intuitive Humanist Model. The intuitive-humanist model focuses on the relationship between the nursing experience, what is learned from the experience and how the experience enhances the clinical judgment process. As the nurse gains experience, clinical judgment and actions are based less on scientific knowledge and more on intuition (Benner, 1984).

Naturalistic Decision Making. The naturalistic decision making model acknowledges that decisions are complex. Information is presented in large quantities and may be ambiguous. The problems and goals are uncertain or poorly defined and decisions are iterative, requiring continuous evaluation. The naturalistic model decisions are high stakes and consequences exist not only for the recipient (patient), but for the decision maker as well. Often, decisions have time constraints, are made in consultation with others, and organizational goals and norms must be considered. Naturalistic decision making is often seen in high-stakes professions such as intensive care nursing or firefighting (Currey & Botti, 2003; Klein, 1999).

Tanner's Clinical Judgment Model. Tanner's Clinical Judgment Model (Tanner, 2006b) proposes that clinical judgment requires the nurse to notice and interpret the concerns, needs or problems of the patient, draw conclusions and respond or act "like a nurse". Reflection on the actions, both during, and after the event, impacts clinical judgment (Tanner, 2006b).

Each of these models identifies similar characteristics needed for good clinical judgment. All decision making requires gathering of data (assessment), classifying the

information, scientific and technical knowledge, analysis, applying patterns and contextual perspective. Tanner's model (Tanner, 2006b) is preferred for this study because it includes the common characteristics of clinical judgment and decision making models, focuses on nurses and utilizes a deliberative process.

Development of Clinical Judgment

Clinical judgment is a process that nurses undertake daily as they provide patient care and manage clinical issues. It is the hallmark of professional nursing (Simmons, 2010; Simmons et al., 2003) and essential to safe patient care (IOM, 2011). The process becomes easier and clinical judgment becomes increasingly intricate with experience both for practicing nurses (Benner, 1984; O'Neill, Dluhy & Chin, 2005) and nursing students (Ashley & Stamp, 2014).

Conceptually, clinical judgment does not follow a linear trajectory, nor is it limited to cognitive understanding (Lasater, 2011; Shelestak, Meyers, Jarzembak, & Bradley, 2015). Instead, multiple factors affect clinical judgment. The context of the situation and what is noticed or determined to be salient initiates the process and is foundational to clinical judgment (Lasater, 2011; Shelestak et al., 2015). The knowledge, skills, competence, values, and experience of the nurse influence the outcome (Banning, 2007; Bjork & Hamilton, 2011; Cappelletti, Engel, & Prentice, 2014; Klein, 1999; Tanner, 2006b; Webber & Newby, 2015).

The context and what the nurse brings to the situation determine what is noticed and stands out as salient. Knowledge, whether scientific or experiential, is critical to the holistic understanding of the situation and informs further assessment (Bittencourt & Crossetti, 2012; Lasater, 2011; Tanner, 2006b). Scientific knowledge comes from

research, evidence and theory. Experiential knowledge is gained in practice through the application of scientific knowledge to specific patient situations (Lasater, 2011).

Beginning nursing students tend to rely on scientific knowledge, the book learning, more than experience, and their assessments become more systematic as they progress in their education (Ashley & Stamp, 2014). These experiences and knowledge affect the individual response to the situation (Tanner, 2006b). Correctly identified cues lead to appropriate decisions, incorrectly identified cues lead to incorrect decisions (Shelestak et al., 2015).

The knowledge, experiences, values and beliefs brought to the clinical situation have greater influence on clinical judgments than the objective data about the situation (Ashley & Stamp, 2014; Cappelletti et al., 2014; Tanner, 2006b). Knowing the patient's typical responses and concerns impacts clinical judgment. The amount and quality of time spent engaged with the patient are important when making clinically sound, relevant and ethical decisions for a patient (Tanner, 2006b; Cappelletti et al., 2014).

Clinical Judgment Constructs

Clinical judgment involves several constructs, used alone or in combination, including heuristics (rules of thumb), intuition, deductive, inductive and analytical thinking (Banning, 2007; Bjork & Hamilton, 2011; Tanner, 2006b; Webber & Newby, 2015). Oftentimes, these constructs are used in a pattern (Cappelletti et al., 2014; Tanner 2006b). Nurses make clinical judgments using different patterns (Tanner, 2006b).

Intuition is characterized by an immediate response in a clinical situation, usually one of apprehension or concern. It is often described as acting without rationale. However, some speculate that intuition grows out of experience (Klein, 1999), and the

precursor is pattern recognition (Klein, 1999; Tanner, 2006b). Intuition, therefore, is practiced less often by novice nurses, who need analytical principles to connect data, interpretation and action, than by experienced nurses (Tanner, 2006b).

Analytic reasoning follows rational logical avenues. The nurse considers the situation and breaks it down into its basic elements. The nurse identifies the theoretical alternatives and systematically compares them to the data at hand, determining the likelihood of the desired outcome. Student nurses use analytics when comparing data to the textbook information (Klein, 1999; Tanner, 2006b).

Deductive reasoning is similar to analytic reasoning. In deductive reasoning, the nurse considers available information and generates a list of possible solutions. As more information is gathered, the list of possible solutions is narrowed. Continued assessment leads to fewer and fewer possible solutions (Klein, 1999).

Narrative thinking, or talking it through, is described as thinking through telling stories. It involves understanding a situation through understanding the meaning people attribute to illness (Tanner, 2006b). Narrative thinking is an important tool for reflection, and facilitates development of practical knowledge and understanding from an experience (Tanner, 2006b).

Inductive reasoning relies on the assumption that known cases can provide information about unknown cases. With inductive reasoning, the nurse extrapolates from experience to draw conclusions about what will happen (Klein, 1999). Inaccurate clinical judgment may result from the nurse using information that is not appropriate to the current situation.

Heuristics are rules of thumb or mental shortcuts used to process large amounts of data and include domain-specific knowledge as well as experience (Simmons et al., 2003). Nurses use a variety of heuristics to facilitate the reasoning process. For example, recognizing a pattern is a heuristic commonly used by nurses. As nurses gain experience, they accumulate information that is deemed critical identifiers to a specific outcome. As they encounter similar experiences, they may mentally skip steps to reach conclusions which have been successful in the past, using fewer of the critical identifiers to make the judgment. Heuristics, such as recognizing a pattern, enable the nurse to match current information with past and respond more quickly.

Educators recognize that new graduates are often lacking in the clinical judgment skills necessary to provide safe, effective care to acutely ill patients (del Bueno, 2005; Gillespie & Paterson, 2009; Holdar, Wallin, & Heiwe, 2013; Newton & McKenna, 2007). Students demonstrate development of clinical judgment through the ability to integrate previous experiences, knowledge and skills in order to implement nursing care in new or unfamiliar clinical situations. Developing appropriate clinical judgment is a process which improves with increased exposure to clinical situations (Jeffries, 2005) and leads to positive patient outcomes (Aiken et al., 2003; Benner et al., 1996). Ideally, real-life healthcare situations in which nursing students fully participate in the role of the professional nurse provide opportunities to develop clinical judgment. In reality, this does not always occur due to the system and situational barriers.

Crucial to making sound clinical judgments is the ability to recognize and respond to abnormal or unexpected situations in a timely manner. Novice nurses, including nursing students, often have difficulty differentiating salient information and applying

domain specific knowledge to the encounter (Norman, 2005; Tanner, 2006b). As a result, they take more time to interpret the situation, delaying clinical judgment and resulting actions and interventions (Ashley & Stamp, 2014; Dreyfus, 2004; Klein, 1999).

Significance of Clinical Judgment in Maternal-Newborn Nursing

Approximately 650 women die each year in the United States as a result of pregnancy or delivery complications (Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, 2015). It is reported that between 28 and 50 percent of maternal deaths are preventable (Berg, Callaghan, Syverson, & Henderson, 2010; Clark, Belfort, Byrum, Meyers, & Perlin, 2008; Creanga et al., 2014; World Health Organization [WHO], 2010). Often, the cause of death is attributed to a failure to notice and respond to cues, such as abnormal vital signs, in a timely manner. Hemorrhage and complications associated with preeclampsia are the leading causes of maternal mortality, and have significant opportunities for prevention or early intervention (Creanga et al., 2014; Say et al., 2014). Women, neonates, and their families, have the right to safe, quality care provided by a competent, professional nurse (Cudé & Winfrey, 2010). As the acuity of mothers receiving nursing care increases, the need for nurses able to make appropriate clinical judgments that promote optimal client outcomes intensifies. Appropriate clinical judgments and skilled care provided before during and after childbirth, can save the lives of women and newborn babies (Clark et al., 2008; WHO, 2010).

Clinical Experiences

Clinical experiences have been a valued traditional learning experience in prelicensure nursing education. This value is grounded on the assumption that, as a

practice-based profession, the role of the nurse must be experienced in a practice environment (Ironside, McNelis & Ebright, 2014). The role of the nurse in the clinical setting is a complex interaction between nurse and patient (Mendes, da Cruz, & Angelo, 2015). Nursing students are immersed in the clinical area in order to gain an understanding of the continuum of care and changes in patient status (Higginson, 2006; Hutchings et al., 2005; Morgan, 2006; Murray & Williamson, 2009). Nursing programs across the United States are challenged with finding sufficient, appropriate opportunities to integrate clinical placements and coursework because of the shift from hospital-based programs to those housed in colleges and universities (IOM, 2011; Murray & Williamson, 2009). Despite widespread agreement that this separation of practice and academia has been beneficial for the profession, nurse educators are challenged to secure opportunities for nursing students to develop and hone knowledge, skills and competencies that are essential for entry into the workforce (Cronenwett & Redman, 2003; IOM, 2011) there is a lack of research identifying best practices and ideal learning opportunities to foster student learning, application of skills, and development of clinical judgment necessary to provide safe, quality care (Ironside et al., 2014; Valiga & Ironside, 2012). Several issues surround clinical placement and clinical experiences for nursing students to develop clinical judgment.

Hospital-based Clinical Experiences

Hospital-based clinical opportunities offer opportunities for nursing student to learn and demonstrate competence. As accrediting bodies mandate a move towards competency-based education, academic programs will need to evaluate students' competence in both written assessments as well as psychomotor demonstration (IOM,

2011). The literature identifies several benefits and challenges of hospital-based clinical experiences with regard to curriculum, logistics, faculty resources and student learning.

Benefits of Hospital-based Clinical Experiences

Hospital-based clinical experiences offer several benefits to nursing students. Interacting with patients in the clinical environment is critical to development of professional characteristics. Several studies provide evidence that supervised clinical experiences improve nursing students' critical thinking skills (Angel, Duffy, & Belyea, 2000), level of confidence (Babenko-Mould, Andrusyszyn, & Goldenberg, 2004; White, 2003). Clinical experiences are important means of teaching professional socialization and the norms of practice (Eraut, 2000; Newton & McKenna, 2007; White, 2003). Working with nursing staff and the interdisciplinary team is integral to understanding the clinical picture, which in turn promotes clinical decision making (Greiner & Knebel, 2003; Henderson, Winch & Heel, 2006; IOM, 2011; White, 2003).

Accreditation from a national or regional body and approval from the state Board of Nursing are essential for nursing programs. Supervised clinical experiences are critical to meeting accreditation and approval requirements. Students must have opportunities for "hands on" nursing experiences with actual patients across the lifespan and the health-illness continuum (AACN, 2013; National Council of State Boards of Nursing [NCSBN], 2005; Spector, 2009).

Challenges of Hospital-based Clinical Experiences

In recent years, aspects of hospital-based nursing clinical experiences have been questioned. Published evidence supporting our current clinical education model is scarce. Use of traditional clinical settings as a learning environment, public demand for

an error-free health care environment, and lack of evidence to determine best practices related to clinical experiences exist (Jacobson & Grindel, 2006; Okuda et al., 2009, p. 337).

The value of the number of clinical hours spent in non-productive, non-learning activities, such as repetitive care tasks and clinical down time, has been questioned. Students report focusing time and energy on completing tasks (bathing, vital signs, medication administration) on time or observing complex procedures (Ebright, Urden, Patterson, & Chalko, 2004; Henderson, Cooke, Creedy, & Walker, 2012; Ironside et al., 2014; Papathanasiou, Tsaras, & Sarafis, 2014), but rarely initiate discussions about reasoning or making the connection between theory and practice in patient situations (Ebright, Urden, Patterson, & Chalko, 2004; Ironside et al., 2014; Papathanasiou, Tsaras, & Sarafis, 2014). There is some evidence associating the inability of student nurses to make connections and see the whole picture in a patient situation with near-miss or adverse events (Ebright et al., 2004).

Providing students with clinical experiences that do not focus on tasks, but rather facilitate making connections between theory and practice is important to clinical faculty. Clinical faculty reported investing increase amounts of time and energy to optimize student learning in the clinical setting, however, the current design of clinical experiences did not appear to be modified. They also reported the desire and need to spend time with individual students in order to provide guidance, supervision and feedback to enhance the learning experience (Ironside & McNelis, 2010). Despite the desire to engage students in deeper learning experiences, faculty report spending significant time supervising students performing procedures such as medication administration and little time fostering

development of clinical judgment (IOM, 2011; Ironside & McNelis, 2010; Ironside & McNelis, 2011; Ironside et al., 2014). Considering the current nursing faculty shortage, it is imperative nurse faculty time is used wisely.

The number of nursing students on a clinical unit at any given time limits opportunities for students to develop patient care skills and stifles student learning (Harrison, 2004). In addition, nurse mentors are challenged when nursing students completing clinical rotations on a particular unit come with different abilities, competencies and varying clinical objectives. Additional challenges are present when nurse mentors working with nursing students are confronted with these varying degrees of ability and scope of practice (L. Shogren, personal communication, October 1, 2010).

Concerns related to staffing shortages, lack of qualified nurse mentors, increasing number of students accepted into nursing programs have raised the issue of capacity to a level of unease. Consequently, clinical facilities are restricting the number and location of student nurse clinical placements (Harder, 2010; Schlairet & Pollock, 2010), placing increasing strain on nursing programs to find adequate learning opportunities for students.

Several authors reported situations in which the clinical environment created an unfavorable learning environment. Opportunities to participate in situations where clinical judgment may be learned are limited when patient needs are complex and unpredictable (Ravert, 2002; Rhodes & Curran, 2005) and the ethical challenge of students “practicing” on patients exists (Bremner et al., 2006). Hathorn and colleagues (2009) reported perceived increased workload for staff when facilitating student experiences in the hospital-based clinical environment.

The maternal-newborn clinical area presents a unique set of challenges. Cudé and Winfrey (2007) reported greater gender bias against male students in the maternal-newborn clinical area, leading to role strain. Women are admitted at different stages and phases of labor, and may not agree to have nursing students participate in the delivery (Miller, 2014; Sittner et al., 2013). Thus educators are challenged with ensuring that students have an opportunity to meet specific maternal-newborn learning objectives, such as experiencing the entire birth process, caring for a woman in labor or in the immediately post-partum, and caring for and assessing a neonate (Sittner et al., 2013). Finally, the litigious environment and complex nursing responsibilities often limit students' opportunities to provide hands on care in the maternal-newborn clinical area (Mahlmeister, 2008).

Simulation Clinical Experiences

High-fidelity simulation may provide nursing students with clinical experiences that are more effective in promoting clinical judgment, offering a potential solution to the problem of limited opportunities in clinical settings (Brindley et al., 2007; Harder, 2010). Standards for use of simulation have been developed but their use is not widespread (Alinier, Hunt, Gordon, & Harwood, 2006; Bremner et al., 2006; International Nursing Association for Clinical Simulation and Learning [INACSL] Board of Directors, 2013). However, the research in this area is growing. The National League for Nursing [NLN] (2013a) conducted research in the area of simulation and nursing education and offers support for educators through the Simulation Innovation Resource Center (SIRC), including simulation scenarios, courses on implementation and integration of simulation into curriculum (NLN, 2013b).

The increasing use of simulation in nursing education programs around the United States has resulted in abundant literature on ways to integrate simulation in the curriculum. In addition, several authors describe students' perception of the impact simulation has on learning, competence, self-efficacy, self-confidence, and competence (Bambini et al., 2009; Foronda et al., 2013; Harder, 2010; Issenberg et al., 2005; Lapkin et al., 2010; Wilford & Doyle, 2006). Consequently, nursing programs have invested considerable money in manikins and other equipment to establish simulation-learning laboratories within the schools. Students now have the opportunity to participate in realistic simulated clinical scenarios and activities that may not have been available to them in the clinical area due to infrequent occurrence or limited access (Akhtar-Danesh et al., 2009; Curl, Smith, Chisholm, Hamilton, & McGee 2007; Issenberg et al., 2005; Morton, 1997; Shepherd, McCunnis, Brown & Hair, 2010). Currently, few states have specific regulations related to simulation and the amount that can be used to replace clinical hours, though programs are using simulation as a clinical learning modality (Hayden, Smiley, & Gross, 2014). While it is widely accepted that simulation is an appropriate teaching method, the evidence comparing the effects of student participation in high-fidelity simulation with those of hospital-based clinical experiences is insufficient (Cappelletti et al., 2014).

Blum and colleagues (2010) reported students participating in clinical experiences demonstrated increased clinical competence compared to those involved in simulation as rated by faculty. Other studies reported gains in knowledge of students who participated in simulated clinical experiences with high-fidelity patient simulators (HFS) as compared to traditional clinical experiences (Schlairet & Pollock, 2010) and participation in

simulation using HFS strengthened students' ability to make appropriate clinical decisions and facilitated progression from novice to advanced beginner (Rhodes & Curran, 2005). Few studies with large, random samples have been published and little evidence is available that defines what portion of clinical hours can be replaced by simulation without a negative effect on student outcomes. The National Council of State Boards of Nursing [NCSBN] Simulation Study was conducted to explore the effectiveness of replacing traditional hospital-based clinical hours with simulation across the curriculum to provide evidence related to the effectiveness of various clinical teaching pedagogies. The longitudinal study included evaluation of the differences in clinical judgment and knowledge (as measured by standardized test scores) as well as performance in practice after graduation. Researchers concluded there were no differences in clinical judgment, NCLEX pass rates, and success in first nursing job when up to 50% of clinical hours were replaced with simulation (Hayden et al., 2014). The results provided nursing programs, accrediting agencies and regulatory bodies with evidence to support the continued use of simulation as a clinical teaching and learning strategy. The literature identifies several benefits and challenges with the use of simulation as a clinical experience, including curricular issues, the impact of logistics related to space, equipment, faculty time and skill level and student learning are noted.

Benefits of Simulation

Simulation experiences are a more systematic, methodical, and controlled approach to teaching. High-fidelity simulators can be readily available to students. Unlike clinical settings in which the patient census or presenting illness may not match the student learning needs, variables within and outside the simulation scenario can be

controlled, such as low frequency, high risk physiological changes (Lasater, 2007a; Nehring, Ellis, & Lashley, 2001) and standardized patient situations (Lasater, 2007a; Nehring, Ellis, & Lashley, 2001). Faculty can integrate course objectives and learning outcomes from the classroom, assigned reading and psychomotor skills into a simulation (Bremner et al., 2006; Decker et al., 2008; Gaba, 2004; Gassert, 2006; Lasater, 2007b).

By design, simulations can mimic clinical experiences and provide nursing students the opportunity to be involved and perform in the role of the professional nurse. Simulation is a means to provide nursing students with the opportunity to develop and demonstrate clinical judgment in an environment that is realistic yet the risk to live patients low (Fisher & King, 2013; Jeffries, 2005; Jeffries, 2014; Lindsey & Jenkins, 2013).

There is a growing body of literature addressing patient safety issues, including descriptions of negligence claims related to student nurse errors. Organizations focused on patient safety, such as the Institute for Safe Medication Practices and the Agency for Healthcare Research and Quality and The Joint Commission have published data regarding student nurse related errors (Mahlmeister, 2008). Mahlmeister (2008) noted miscommunication with the primary nurse, medication errors and failure to recognize neonatal emergency as common errors made by student nurses. Simulation offers the ability to create scenarios that, if occurring in a traditional patient care setting, would be high-risk, in a relatively low-risk, low-anxiety environment. This allows students to make errors without risk to live patients (Nehring, Ellis, & Lashley, 2001).

High fidelity simulation allows large numbers of students to participate in the same scenario in small group settings and learner and instructor time is used more efficiently (Fort, 2010; Hyland & Hawkins, 2009; Morton, 1997). The ability to create simulation that facilitate improvement in communication skills (Lasater, 2007a; Nehring, Ellis, & Lashley, 2001; Sleeper & Thompson, 2008), interpersonal and interdisciplinary teamwork (Baker, Pulling, McGraw, Dagnone, Hopkins-Rosseel & Medves, 2008; Kenaszchuk, MacMillan, van Soeren, & Reeves, 2011; Lasater, 2007a; Nehring, Ellis, & Lashley, 2001; Robertson, Kaplan, Atallah, Higgins, Lewitt, & Ander, 2010) and psychomotor and technical skills (Lasater, 2007a; Nehring, Ellis, & Lashley, 2001; Ross, 2012) have been noted. Simulation offers the opportunity to evaluate specific clinical practices without having to wait until the opportunity arises in the clinical setting (Gomez, Lobodzinski, & West, 1998). Finally, faculty can provide immediate feedback during the simulation or in the post-simulation debriefing (Decker et al., 2013; Feingold, Calaluce, & Kallen, 2004; Lasater, 2007a).

Challenges of Simulation

The literature identifies several concerns when implementing simulation. Simulation can be costly to implement, and simulators may still be imprecise. The equipment is expensive. For example, Laerdal's high fidelity human patient simulator (HFHPS), SimMan 3G, sells for approximately \$67,000 (D. Baumgartner, personal communication, September 18, 2013). Lack of funding to support its use continues to be a challenge for many programs (Kardong-Edgren et al., 2012).

Simulation is constrained by the degree to which it can mimic reality. Simulator fidelity, or realism, including the lack of facial expressions, reflexes, swelling or skin

color changes are distinct disadvantages (Decker et al., 2008; Fisher & King, 2013; Gaba, 2004; Jeffries, 2014; Lasater, 2007b; Rhodes & Curran, 2005; Spector, 2009; Wolfgram & Quinn, 2012). Environmental and psychological fidelity is difficult to achieve as some patient care areas are more challenging to replicate than others (Morton, 1997).

Ensuring sufficient faculty resources, both in number and with appropriate training, is crucial to the success of the simulation program (INACSL Board of Directors, 2013). Faculty training on the technology and scenario development is time consuming and costly (Kardong-Edgren et al., 2012), but a critical component for success (Nehring & Lashley, 2004). At any given time, only a small number of students can interact with the manikin requiring additional faculty time (Henrichs, Rule, Grady & Ellis, 2002; Nehring, Ellis, & Lashley, 2001), and faculty report lack of compensation for the additional time (Feingold et al., 2004; Jones & Hegge, 2008; Nehring & Lashley, 2004). Jones and Hegge (2008) reported the majority of faculty surveyed (55.2%) estimated that 0.50 FTE was needed to plan how to incorporate simulation use in courses for one semester and nearly as many (44.8%) estimated an additional 0.50 FTE was needed to implement high-fidelity simulation in the courses they teach. Evaluation of the simulation used in courses would require an additional 0.25 FTE. There is a nursing faculty shortage in the United States (Health Resources and Services Administration [HRSA], 2013; Budden, Zhong, Moulton, & Cimiotti, 2013), and this additional need for faculty time increases that burden. Financial support for simulation use is lacking (Kardong-Edgren et al., 2012).

Clinical Judgment Research

Early research shows positive feedback from students reporting increased confidence and knowledge resulting from participation in simulation (Bambini et al., 2009; Foronda et al., 2013; Harder, 2010; Issenberg et al., 2005; Lapkin et al., 2010; Wilford & Doyle, 2006). However, published research describing the effects of simulation experiences on clinical judgment is scarce. Literature discussing how simulation compares to hospital-based clinical experiences is also lacking.

Simulation appears to offer students opportunities to be actively involved in clinical situations that may not be routinely available. Clinical facilities continue to limit the clinical time for nursing students and at the same time expecting nursing graduates to have stronger patient care abilities, make appropriate clinical judgments and provide safe care (Harrison, 2004; Hutchings et al., 2005; IOM, 2011; Pauly-O'Neill et al., 2013). Gassert (2006) suggests utilizing simulated learning environments as a means of increasing competence in beginning practitioners and reducing the hours in clinical sites that students need to acquire basic skills and further recommends that research be initiated to measure the impact of simulation learning on baccalaureate nursing student education (p. 167).

Simulation has been used in some nursing research to study clinical judgment (Cant & Cooper, 2009; Decker et al., 2008; Harder, 2010; Hayden et al. 2014; Lapkin et al., 2010). Research in the area of simulation as a teaching strategy and clinical judgment in nursing students has demonstrated simulation is a preferred learning strategy that enhances confidence in nursing students (Bambini et al., 2009; Blum et al., 2010; Brown & Chronister, 2009; Jeffries, 2007).

Several studies evaluated students' clinical judgment or clinical competence when simulation replaces a portion of clinical time (Hayden et al., 2014; Meyer, Connors, Hou, & Gajewski, 2011; Schlairet & Fenster, 2012; Watson et al., 2012). Differences in clinical performance were noted in a few studies. Meyer and colleagues (2011) reported higher clinical judgment scores at the four week pediatric clinical evaluation for students who participated in simulation replacing 25% of clinical time ($p = 0.03$), but found no significant differences at the end of the term ($p = 0.36$). They concluded that students achieved higher ratings more quickly after participating in simulation than those who did not participate in simulation. Watson and colleagues (2012) also reported no significant differences ($p < 0.05$) in physiotherapy students' clinical performance at the end of the term following a randomized control study replacing simulation for 25% of clinical experiences. Schlairet and Fenster (2012) conducted a mixed methods study in a nursing fundamentals course to determine which of eight "design schemas" in various dosing (0%, 30%, 50% or 70%) and sequencing (interleaved or blocked by type) is most effective on the development of clinical judgment nursing students in a fundamentals course. Researchers reported of the eight groups/design schema, only one had significantly different clinical judgment scores: students participating in 30% dose group with simulation as the final two clinical experiences scored significantly lower than other student groups ($p = 0.02$), including the group that participated in 30% dose with simulation as the first two clinical experiences. No significant differences were found among the remaining groups/design schema.

The largest study, The National Council of State Boards of Nursing Simulation Study, was a longitudinal, multi-site study investigating the use of simulation to replace

clinical hours. Researchers evaluated performance using the Creighton Simulation Evaluation Instrument™ (C-SEI)™, comprehensive knowledge through standardized tests from Assessment Technology Institute® (ATI) and post-graduation survey of employers. The researchers reported no significant difference in the final evaluation of clinical competence ($p = 0.688$), comprehensive knowledge ($p = 0.478$) or NCLEX-RN® pass rates ($p = 0.737$) when varying amounts of clinical hours (10%, 25% or 50%) were replaced with simulation (Hayden et al., 2014). Overall, no significant differences on end of term evaluations of clinical judgment have been reported comparing simulation to clinical experiences. The results of these studies add to the body of knowledge related to the use of simulation as a clinical learning strategy.

Several questions remain, specifically related to using simulation to replace clinical experiences with persons across the health-wellness continuum and developmental stages. Few articles provided findings correlating clinical judgment and number of hours and the placement of simulation within a clinical course. Further research is needed comparing clinical judgment of nursing students participating in simulation as compared to clinical experiences. Research in this area will facilitate recommendations related to quality and quantity of simulation and clinical experiences for prelicensure nursing education.

Measuring Clinical Judgment

Educators are challenged with evaluating clinical performance of nursing students in a consistent, reliable method (Adamson, Gubrud, Sideras, & Lasater, 2012). The use of high fidelity simulation has not eased the problem. Evidence-based evaluation is critical to achieving evidence-based practice in nursing education (Oermann & Gaberson, 2009).

To address this concern, several evaluation instruments have been developed to measure clinical judgment (Adamson et al., 2012; Adamson & Kardong-Edgren, 2012; Kardong-Edgren, Adamson, & Fitzgerald, 2010).

Seattle University Evaluation Tool©. Nurse educators developed the Seattle University Evaluation Tool© (Mikasa, Cicero, & Adamson, 2013) to objectively measure student performance in simulation experiences. The evaluation focuses on the areas of assessment, intervention, evaluation; critical thinking and clinical decision making; direct patient care; communication and collaboration; and professional behaviors. Scores range from zero to 25. Validity and reliability of the tool has been established (Adamson & Kardong-Edgren, 2012).

Creighton-Simulation Evaluation InstrumentTM. The Creighton-Simulation Evaluation InstrumentTM (C-SEI)TM is based on the American Association of Colleges of Nursing (1998) baccalaureate essentials (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008). It is designed for simulation experiences and is organized around four categories: assessment, communication, critical thinking and technical skills. Each of 22 behaviors are assigned a score of one (minimum competency), zero (does not meet minimum competency) or NA (not applicable). The sum of the scores is then divided by the total number of applicable behaviors, resulting in a percentage score for each student. Modifications were made to this tool, and validity and reliability were determined (Parsons, Hawkins, Hercinger, Todd, Manz, & Fang, 2012).

Lasater Clinical Judgment Rubric©. The Lasater Clinical Judgment Rubric© (LCJR) (Lasater, 2007a), based on the Tanner's Clinical Judgment Model (Tanner, 2006b), consists of eleven subscales corresponding to the four dimensions: noticing, interpreting,

responding and reflecting. The LCJR quantifies the development of clinical judgment (Lasater, 2007a). Clinical judgment is measured using a Likert-type scale indicating level of clinical judgment from one to four (beginning, developing, accomplished, exemplary), in 11 items within the four dimensions. Scores on the Lasater Clinical Judgment Rubric range between 11 and 44 (Lasater, 2007a). Validity and reliability have been established (Adamson et al., 2012; Adamson, Kardong-Edgren, & Willhaus, 2013). The LCJR, was used in this study and is described in more detail in the following chapter.

Summary

Healthcare in the United States is changing. Patient acuity is increasing. The patient population is becoming more diverse (IOM, 2011). Who nurses are and what nurses do is changing as well. The average age of nurses is increasing and the gender, racial and ethnic diversity of the workforce is changing. More men are entering the nursing workforce (HRSA, 2013). Strong clinical judgment skills are needed to provide safe, quality, patient-centered care.

This chapter has presented current state of clinical judgment and the relationship between clinical learning and clinical judgment development. Two common clinical learning opportunities used in nursing education, simulation and hospital-based experiences, were described. Benefits, concerns and obstacles to clinical education and simulation have been highlighted. Providing opportunities for nursing students to develop strong clinical judgment abilities is the cornerstone of nursing education. While clinical experiences in the hospital environment are important, scant research is available supporting the current apprenticeship model used in traditional, hospital-based clinical experiences in promoting clinical judgment. These clinical experiences are not

adequately meeting educational needs of students and nursing programs are meeting significant challenges securing and utilizing hospital-based clinical opportunities.

Replacing hospital-based clinical experiences with simulation may be an excellent means of addressing the challenges. Research evaluating the efficacy of simulation as a clinical learning modality has been found to be lacking. This study was designed to determine if there are differences in clinical judgment in students participating in simulation as compared to hospital-based clinical experiences. The following chapter will review the research plan and methodology used for this study.

CHAPTER III
RESEARCH AND DESIGN METHODS

Introduction

Chapter three provides a detailed accounting of the research design and methods. This includes (a) population description, (b) sampling plan, (c) recruitment, (d) research design, (e) measurement methods, (f) data collection procedures, and (g) plan for data analysis. The chapter will conclude with protection of human rights and data monitoring plan.

Purpose

The purpose of this study was to determine if there are differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation as compared to hospital-based clinical experiences. The foci were to: (1) determine if there were differences in nursing students' ability to demonstrate clinical judgment in an evaluative simulation following participation in simulation as compared to hospital-based maternal-newborn clinical situations and (2) identify which demographic characteristics (age, gender, race/ethnicity, type of nursing program, current employment status, highest degree earned, grade in didactic maternal-newborn (MNB) course, and experience with pregnancy or childbirth) were associated with clinical judgment scores in the evaluative simulation. Additional evidence is needed to show the

effectiveness of simulation as a replacement for hospital-based clinical hours in fostering the development of clinical judgment.

Population Description

The target population included students enrolled in prelicensure professional nursing programs in Minnesota. Prelicensure professional nursing programs were chosen because they offered a sample population similar in diversity of age, gender, and race/ethnicity. The number of new graduate registered nurses educated in the United States who passed the licensure exam (NCLEX-RN[®]) in 2011 was 142,000 (HRSA, 2013, p. viii). Of these, 58,246 were baccalaureate prepared (40%) and 86,337 were non-baccalaureate prepared (60%) (HRSA, 2013, p. viii). In 2014, Minnesota had 3,075 candidates eligible to take the NCLEX-RN[®] exam: 1,084 (35%) graduates from baccalaureate degree programs and 1,991 (65%) graduates from Associate Degree nursing programs (Minnesota Board of Nursing, 2015). The Minnesota Department of Health, Office of Rural Health and Primary Care [MDH-ORHPC] workforce survey reported, at time of Registered Nurse (RN) licensure, approximately 51.1% of registered nurses in Minnesota had an associate's degree and 36.4% had a baccalaureate degree (as cited in Minnesota Board of Nursing, 2015, p. 13). In the United States, about 55% of the RN workforce holds a baccalaureate degree or higher (HRSA, 2013, p. 20). At the time of this study, the average age at time of licensure by examination in Minnesota was 26.2 years from baccalaureate degree programs, and 32.5 years from associate degree programs (Minnesota Board of Nursing, 2015, p. 13). The population of nurses in Minnesota remains predominantly white and female. Males accounted for 9.1% of registered nurses in the United States (HRSA, 2013, p. 24) and 12.7% of registered

nurses in Minnesota (Minnesota Board of Nursing, 2015, p. 14). Minnesota's non-white population is estimated at 14.3% (United States Census Bureau, 2015). The ethnicity of RN candidates for licensure in Minnesota is 10.7% (by self-report) (Minnesota Board of Nursing 2015, p. 15). This compares to registered nurses in the workforce self-reported non-white ethnicity of 6.6% per the MDH-ORHPC workforce survey (as cited in Minnesota Board of Nursing, 2015, p. 14). HRSA (2013) reports 24.7% of registered nurses self-report race/ethnicity as non-white (p. 24).

Sampling Plan

The sample drew from students in accredited professional nursing programs in Minnesota. Minnesota has 14 accredited associate degree programs and 18 accredited baccalaureate degree programs, totaling 35 accredited professional nursing programs in Minnesota (Minnesota Board of Nursing, n.d.).

Program Inclusion and Exclusion Criteria

Inclusion criteria for this study consisted of nursing programs accredited by a national nursing accrediting body approved by the United States Department of Education. In addition, the program must

- offer prelicensure professional nursing education culminating in an associate degree or baccalaureate degree;
- offer a clinical course with a maternal-newborn component;
- have facilities to offer and record high-fidelity simulation;
- devote clinical hours to simulation throughout the program;
- be willing to record the high-fidelity evaluative simulations.

Participant Inclusion and Exclusion Criteria

Inclusion criteria for this study consisted of consenting professional nursing students who were enrolled in a maternal-newborn clinical course as part of an accredited nursing program; were at least 18 years of age; and were able to read, write and understand English. Students not meeting these criteria were excluded. Enrollment in a clinical course with a maternal-newborn component was chosen for this study because the course is typically offered after students have participated in other hospital-based and simulation clinical experiences and the availability of clinical experiences in the maternal-newborn (obstetrics) specialty area is scarce (Harrison, 2004; Hutchings et al., 2005; IOM, 2011; Pauly-O'Neill et al., 2013). Selection of students from associate degree and baccalaureate degree programs was expected to represent the population of nursing students in Minnesota. Diploma and Entry-level Master's Degree programs, programs without national accreditation, without maternal-newborn clinical experiences with a minimum of three clinical shifts, without facilities to offer and record high-fidelity simulation or unwilling to devote clinical hours to simulation were excluded.

In quantitative research, sample size is determined by a power analysis. The power of a statistical test is directly related to the Type II error (β) or probability of falsely retaining an incorrect null hypothesis. Statistical power depends on three parameters: (1) significance level of the test (α), (2) the effect size parameter such as Cohen's d and (3) the size of the sample used for the test. Sample size can be calculated if the power, significance and effect size are known (Faul, Erdfelder, Lang, & Buchner, 2007). G*Power 3, a general power analysis program for statistical tests (Faul et al., 2007) was used to calculate sample size. The following values were used to calculate

sample size: power = 0.80, significance (α) = .05, effect size (Cohen's d) = 0.76 (Adamson et al., 2012, p. 72). A sample size of 58 subjects (29 in each group) was calculated for this study.

Recruitment

An invitation describing the study and participant minimum inclusion and exclusion criteria was sent to administrators of professional nursing programs in Minnesota (see appendix A). Programs indicating interest were contacted by the Principal Investigator (PI) and program curriculum was evaluated against inclusion and exclusion criteria. The PI met with program administrators and faculty to answer any questions. Two nursing programs agreed to allow recruitment and met the program inclusion and exclusion criteria. Letters of support were obtained from program administrators approving study recruitment.

Approval from the University of North Dakota (UND) Institutional Research Board (IRB) was received (see Appendix B). Institutional Review Board approval was obtained from each of the institutions with programs participating in the study.

Following IRB approval from the institution, an e-mail invitation was forwarded to all students enrolled in the maternal-newborn course (see Appendix C). This sampling approach was designed to reduce bias and promote generalizability. It was anticipated that the sample would be diverse with regard to age, gender, and ethnicity.

A face to face meeting with students was scheduled and the PI met with potential participants to explain the study, procedures and requirements to eligible participants registered for the maternal-newborn clinical course. PI presented participation requirements and all participants signed a written consent form (see Appendix D), which

included the purpose of the study, anticipated numbers of participants, procedures, risks, benefits, and measures to protect confidentiality. Participation in the study did not affect the grade earned for the course. Participation was voluntary and participants could withdraw from the study at any time. A token gift card, valued at \$10, was given to participants upon completion of the consent and demographic questionnaire.

Research Design

An experimental design was used to determine if there were differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation as compared to hospital-based clinical experiences. Figure 2 shows the order of experiences for participants. Prior to the first clinical experience, students completed learning modules related to maternal-newborn nursing care inherent in the hospital setting. Learning modules included reading and didactic content related to pregnancy, birth, postpartum and newborn assessments and nursing care; videos of birth and postpartum nursing care; using task trainers or low-fidelity manikins for practicing mother cares such as assessing the fundus, lochia, urine output and readiness for discharge; and using low-fidelity manikins for assessing for jaundice, newborn bathing, hypoglycemia protocol and newborn vital signs. All students were required to participate in all assigned clinical hours. However, participation in the study was voluntary. All evaluative simulation experiences were recorded as usual practice. There was no additional participant burden.

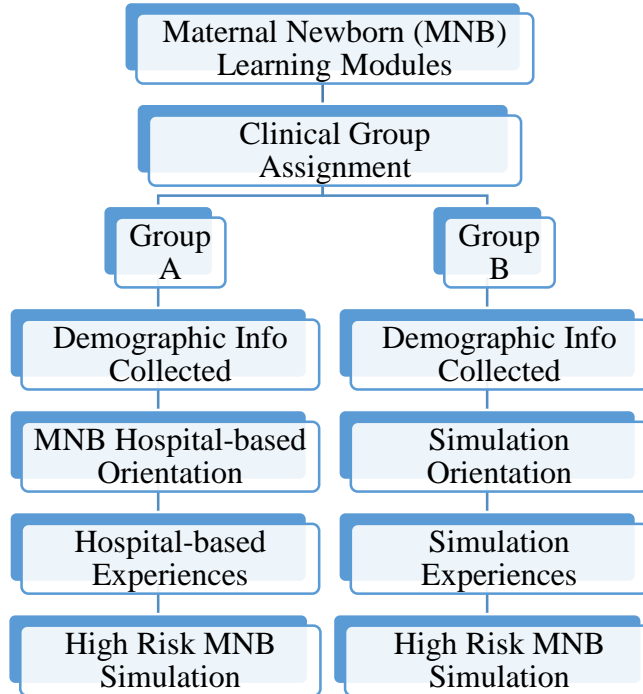


Figure 2. Schedule of Simulation and Hospital-based Clinical. This figure illustrates the order of events for the simulation and hospital-based clinical groups.

Group Assignment

Participants were assigned to one of two clinical groups (Group A / Group B) by the clinical course faculty, based on course registration. All students participated in high-fidelity clinical simulations in previous nursing courses. An orientation to simulation (manikins, academic electronic health record (EHR), and simulation center environment) was part of the clinical course expectations. Students in the hospital-based clinical group received orientation to the maternal-newborn clinical site and population prior to the maternal-newborn hospital-based clinical experiences. Participants received an orientation to simulation in general and to the study simulation in particular prior to participation in the evaluative simulation experience.

At time of consent, participants provided demographic information (Appendix E). Demographic data collected included age, race/ethnicity, gender, and current educational program (associate or baccalaureate degree). Each group of students participated in clinical or simulation experiences as scheduled by the clinical course team leader of the participating nursing program. Group A participated in hospital-based maternal-newborn clinical experiences for the assigned clinical rotation. Group B participated in maternal-newborn simulation experiences for the assigned clinical rotation. Post-clinical debriefing occurred at the end of each clinical or simulation day. All members of the group participated in the debriefing. Following completion of the assigned clinical rotation, students from both groups participated in a final evaluative simulation consisting of a high-risk maternal-newborn simulation and subsequent debriefing.

Hospital-based Clinical Experiences

The hospital-based clinical experiences took place at the hospital with which the nursing program had a contract to participate in maternal-newborn clinical experiences. The hospitals have a designated birthing center and provide care to mothers and babies before, during and after birth. Hospitals were small, with less than 250 births per month. The patient population represents a variety of cultures, including Caucasian, Hmong, Latina and Somali, living in urban, suburban, and rural locations. An ideal assignment allowed each student to provide care for two days to a first time mother-newborn dyad following either vaginal or cesarean section birth. The mother baby dyad was stable and without significant medical or psychosocial comorbidities. The student was expected to perform a full nursing assessment under the observation of the instructor or staff nurse. The student administered ordered medications with the instructor or staff RN present.

The student completed charting on the patient using the hospital's electronic health record (EHR), documented assessment findings, medications and patient teaching for the assigned shift (A. Winrow, personal communication, October 30, 2013; K. Ziefle, personal communication, November 21, 2014).

Simulation Experiences

Simulations took place at the nursing programs' on campus simulation center. The simulation center has several manikins of varying "ages" and fidelity, rooms equipped to mirror the hospital setting, and access to supplies and equipment used in the maternal-newborn hospital setting. The simulation center was staffed with faculty experienced in maternal-newborn nursing and the use of simulation in nursing education.

In the study simulation clinical experiences, students participated in several maternal-newborn simulation stations. Simulation stations included clinically realistic simulations with high-fidelity manikins, standardized patients, and clinical equipment in a high-fidelity environment, low-fidelity manikins in lower fidelity environments and case studies. Each learning station addressed maternal-newborn clinical content, created to mimic typical experiences of caring for women and neonates in the maternal-newborn hospital-based setting. Simulation stations included review of a patient chart and case studies using an academic EHR; normal mother and newborn care including physical care and teaching topics typical in maternity care; identification of nursing diagnoses and priority for care; practice using the high-fidelity manikins and clinical equipment (IV pump, bed, and academic EHR).

The Evaluative Simulation

A standardized simulation scenario (Murray, 2011b) retrieved from a simulation scenario bank associated with a maternal-newborn nursing text (Murray, 2011a) was used for the evaluative simulation experience. Previous simulation studies have successfully utilized this method to maintain student engagement (Hayden, 2010; Jeffries & Rizzolo, 2007). The simulation scenario for the evaluative simulation consisted of a high-risk maternal-newborn clinical event (post-partum hemorrhage). The scenario was reviewed and evaluated for content validity by expert maternal-newborn nurses and at least one faculty member teaching the clinical course.

Following completion of the scheduled simulation or hospital-based maternal-newborn clinical experiences, students participated in the evaluative simulation experience. Prior to the experience, students were provided with the simulation objectives, expectation and assigned readings. Prior to the simulation experience, students participated in a pre-brief session discussing the objectives, expectations, assigned readings and faculty answered student questions.

In this final evaluative simulation, students provided care to a postpartum woman and newborn dyad in the initial postpartum period – one to two hours after birth. After receiving report on the mother/neonate couplet, students encountered a patient lying flat in a bed, with the newborn in the bassinet nearby. Students were expected to complete assessments, notice, interpret and respond to the mother's boggy fundus, significant lochia (blood, mucus, and uterine tissue from the vagina after giving birth) and complaints of severe cramping and abdominal pain; cues from the neonate such as crying, circumoral cyanosis and low temperature; and requests to begin breastfeeding. Faculty

acting as the voice of the patients had scripts to follow with cues and prompts to ensure that each simulation experience was presented consistently. These prompts required additional exploration, patient education and response to the needs of the mother/neonate couplet and family members.

Each student was an active participant in the role of the registered nurse during the 30 minute simulation and an active observer for approximately 90 minutes of simulation. Faculty participated as the voice of the patient and acted as Primary Care Provider (PCP) when students called for the PCP. Debriefings, facilitated by faculty, lasted approximately 60 minutes and included review of selected portions of the recording and prompts for students to reflect on actions taken.

All final evaluative simulation experiences and debriefings were recorded. Recordings of students choosing not to participate were omitted. Student names and clinical groups were omitted from the recordings (de-identified). Faculty labeled each recording with the appropriate student code created at time of consent. Following completion of the clinical course, the PI viewed the recorded high-risk maternal-newborn simulation experiences. Students' actions and responses were observed and clinical judgment was scored by the PI using the Lasater Clinical Judgment Rubric (LCJR) (Lasater, 2007a).

Observation-based Evaluations

It is challenging for nurse educators to formatively evaluate students' thinking and judgment and facilitate their development and growth as a nurse (Oermann & Gaberson, 2009). Observation-based evaluations are widely used in the education and evaluation of health professionals. This type of evaluation has a unique set of challenges

related to the instrument and the rater (McGaghie, Butter, & Kaye, 2009). Reliability and validity of the data are integral to drawing conclusions (Axelson & Kreiter, 2009; Adamson, 2014).

Rubrics offer advantages directly related to fostering learning that leads to development of clinical judgment. Specifically, good rubrics have specific and clearly expressed outcomes, common language that foster communication between evaluators and those being evaluated, allowing for constructive feedback that is understandable and promotes growth (Stevens & Levi, 2005). Rubrics can be useful in evaluating specific tasks and clinical performance of nursing students (Bonnell, 2009). As simulation is used with increasing frequency in nursing education, using rubrics to evaluate student performance and clinical judgment in simulation is appropriate (Davis & Kimball, 2011).

Lasater Clinical Judgment Rubric

The Lasater Clinical Judgment Rubric (LCJR) (Lasater, 2007a) was used to evaluate clinical judgment of each participant in the evaluative maternal-newborn simulation. The LCJR, based on the Tanner's Clinical Judgment Model (Tanner, 2006b), consists of subscales corresponding to the four dimensions: noticing, interpreting, responding and reflecting and quantifies the level of clinical judgment (Lasater, 2007a).

The rubric offers language to describe dimensions of clinical judgment. Clinical judgment was measured using a Likert-type scale indicating level of clinical judgment from one to four (beginning, developing, accomplished, exemplary), in 11 items within the four dimensions. Items include such characteristics as recognizing deviations from expected patterns, information seeking, prioritizing findings, communicating clearly, performing in a confident manner and demonstrating well-planned interventions. Table 1

lists the dimensions of the rubric and corresponding characteristics. The rubric uses universally understood language and sets standards that participants can comprehend. Scores on the LCJR range between 11 and 44 (Lasater, 2007a). See Appendix F for a sample LCJR.

Table 1. Dimensions of Lasater Clinical Judgment Rubric and Characteristics

Dimension	Characteristic
Effective Noticing	Focused assessment Recognizing deviations from expected patterns Information seeking
Effective Interpreting	Making sense of the data Prioritizing
Effective Responding	Calm, confident manner Clear communication Well-planned interventions Skillful actions
Effective Reflecting	Evaluation and self-analysis Commitment to improvement

Validity and Reliability

The validity and reliability of the instrument and the raters are essential to observation-based evaluations. Validity and reliability of the LCJR has been established (Adamson & Kardong-Edgren, 2012; Adamson et al., 2012; Lasater, 2007a). The PI has met requirements to ensure rater reliability. Several measures were executed to ensure validity and reliability for this study.

Validity. Validity is a “the degree to which an instrument measures what it is intended to measure” (Polit & Beck, 2012, p. 336). Gubrud reported students whose domain specific knowledge was stronger demonstrated improved clinical judgment on the

LCJR, thus supporting content validity (Adamson et al., 2012, p. 71). Comparison of groups on clinical judgment aspects (noticing, interpreting, responding, and reflecting) resulted in significant p values ($< .05$) as well as effect size greater than 0.76 and associated z-scores of > 78 (Adamson et al., 2012, p. 72), indicating the tool has adequate validity.

The LCJR had specific metrics for each dimension of the clinical judgment (noticing, interpreting, responding, and reflecting) (see Appendix A). Within each dimension are specific characteristics with metrics to define the various levels (exemplary, accomplished, developing, and beginning). Based on the simulation scenario, specific expected behaviors were identified and used for scoring each of the dimensions. This facilitates consistent scoring as it is specific to the scenario at hand, thus ensuring the evaluation is standardized in format and scoring (INACSL Board of Directors, 2013). The scores for each dimension were tallied, and composite (total) scores were used in the data analysis. Composite scores are almost always more reliable than the respective parts (Axelson & Kreiter, 2009, p. 71). Use of a reliable and valid rubric and application of pre-determine, scenario-specific actions in each of the dimensions ensured that the results are valid and reliable.

Reliability. Reliability is “the degree of consistency or dependability with which an instrument measures an attribute” (Polit & Beck, 2012, p. 331). Adamson found faculty raters accurately and consistently identified the intended level of student performance using the LCJR (intra-class correlation, $ICC = 0.889$) (Adamson et al., 2012). To ensure observational assessments are trustworthy and the data collected are reliable, measures to diminish rater bias and improve intrarater reliability are

recommended. Rater training is the most frequent recommendation (Downing, 2005). Other approaches include utilizing existing rubric, create specific competencies or rubric criteria, using recordings, and re-viewing recordings to ensure consistent scoring (Hauer, Holmboe, & Kogan, 2011; Isaacson & Stacy, 2009; McGaghie et al., 2009). These methods were used within this study, and will be described in the following paragraphs. Employing these methods will add to the reliability of the data.

Rater Training. The PI completed a research practicum with Dr. Stephanie Sideras, an expert in the areas of observation-based evaluation and simulation (see Appendix G for Dr. Sideras' Curriculum Vitae). The practicum involved revising a rubric for evaluating student performance in high-fidelity simulations. A literature review was done to collect evidence and determine best practices related to reliability and validity when creating an evaluation rubric. Dr. Sideras and the PI independently reviewed recordings of student performances and scored them on the revised rubric (OSCCR2). Dr. Sideras and the PI met to compare evaluation scores and discuss concerns, and challenges related to the rubric language and scoring options related to the student performance. Revisions were made to the rubric language and scoring options and additional recordings were reviewed using the revised rubric to ensure revisions reduced the occurrence of the identified concerns or problems. This 135 hour research practicum provided the PI with education and experience utilizing rubrics, applying rubric language and scoring.

Recordings for Observation-based Evaluations. Validity and reliability can be enhanced by using appropriate audio and video recording for observation-based evaluations, including positioning of individuals and cameras to allow for evaluated

behaviors to be seen (Adamson, 2014, p. 159). Two camera angles were used for each of the recordings of the evaluative simulations, allowing the observer to see a broad picture of the space and a close up of the patient in the bed. Recordings allowed the PI to stop, rewind and review the scenario to ensure that all student actions are included in the evaluation rating.

Intrarater Reliability. Rater reliability and validity must also be considered. Oftentimes, performance scoring is distributed across several raters, hence consistency among raters (interrater reliability) becomes an important consideration. In this study, the PI was the sole rater of the final evaluative simulation recordings, consequently consistency by the single rater (intrarater reliability) was a key consideration. One challenge affecting rater reliability and validity is observer bias, which can introduce additional error into the evaluation (Adamson, 2014). Measures were implemented to diminish bias and improve intrarater reliability and validity. A test-retest method of evaluation is an example of assessing intrarater reliability (Adamson, 2014, p. 158). Periodically, the PI (rater) re-scored previously viewed recordings and compare scores to ensure consistency.

Data Collection

Data collection was completed over a period of 20 months. Data collected during the study included demographic information, video and audio recordings of the evaluative simulations. Evaluative simulations were viewed and scored for each dimension of the LCJR. The scores for each dimension were tallied, and composite (total) scores were used in the data analysis.

Upon completion of the consent process, each individual completed a demographic survey and created a unique code used for subsequent data collection. The code was used to identify the participant in the evaluative maternal-newborn simulation video, corresponding LCJR score, and demographic data. At course completion, the course faculty provided the PI's advisor with the student name and corresponding code, clinical group assignment and didactic course grades. The PI did not have access to information linking the identifiable student data (e.g. name) to the individual's unique code or group designation.

The participants were video and audio recorded while participating in the evaluative simulation and debriefing. Recordings were de-identified by student name and clinical group. The PI viewed each recording and scored each participant on every dimension of the LCJR (Lasater, 2007a). After all recordings were viewed and scored, the PI obtained clinical group designation, by code, for each participant.

Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 22 (International Business Machines Corp. [IBM], 2013). Demographic data were analyzed to ensure that Group A and B were similar. The descriptive analysis included review of frequency and percentages of participant gender, age range, race/ethnicity, and program type (baccalaureate or associate degree).

An alpha level of 0.05 was used to determine significance when examining the research questions. The associations between composite clinical judgment scores for each group were examined using an independent sample t-test. Because the overall sample size was 62, properties of the central limit theorem satisfy t-test assumption of normality for

all hypothesis tests conducted using t distribution (Field, 2009). De-identified demographic data were analyzed for association with scores on the LCJR using correlation and linear regression.

Limitations

It was assumed the diversity in age, race, gender and educational level of the participants reflected that of the population of students enrolled in nursing programs. Every effort was made to recruit and retain participants that represent the population. However, the nursing programs using both hospital-based and high-fidelity simulation in the maternal-newborn clinical course were very limited. Recruitment took more than 18 months. The programs that participated in the study used simulation to educate nursing students, had the required simulation lab resources and equipment for high-fidelity simulation. Not all programs have the same level of interest in simulation or devote clinical hours to simulation. Many programs do not have facilities to offer and record high-fidelity simulation due to time, financial and faculty resources.

Each nursing program from which participants were recruited had established methods of assigning students to clinical groups. Each student registered for a specific course section. Student registration was taken into consideration when assigning students to simulation or hospital-based clinical groups.

The nature of the simulation fidelity continuum and varying previous experiences with simulation may affect a student's performance and clinical judgment in simulation. Clinical realism with regard to manikin, environmental, and psychological fidelity are critical (Dieckmann, Gaba, & Rall, 2007; Dieckmann, Manser, Wehner, & Rall, 2007). Attempts were made to provide these levels of realism, however, this is not the same as

reality. No matter how clinically realistic the simulation design, the student was required to “pretend” a level of reality with the manikin looks and responses (verbal and physiologic), medication administration, and equipment, etc. (Horcik, Savoldelli, Poizat, & Durand, 2014). The resulting scores for clinical judgment reflect student performance at the time.

While it has been determined the LCJR instrument is reliable and valid, further reliability studies are needed (Adamson et al., 2012). Therefore, results from this study may not be generalizable to other patient care scenarios, specifically those outside of a simulation environment. No single instrument can provide a comprehensive evaluation of student performance or clinical judgment, nor can evaluation of clinical judgment be completed in one episode. Many factors are involved in clinical judgment, therefore evaluation data from the LCJR should be considered a snapshot of student performance.

Safety Monitoring

Participants. Participants were nursing students enrolled in a prelicensure professional nursing program in the Midwest and registered for a maternal-newborn clinical course. All ages and ethnic/racial groups were included in recruitment. Participants were able to read, write and understand English. Participants were nursing students registered for a maternal-newborn clinical course. Students were required to participate in either maternal-newborn simulation or hospital-based maternal-newborn clinical as part of the course curriculum. Students could choose not to provide permission for recordings to be used in the research. Recordings of students choosing not to provide permission were not made available to researchers.

Sources of Data. Data were in the form of demographic information, recorded simulations, and scores on the LCJR instrument. Codes were assigned to each participant. Recordings, LCJR scores, demographic data and the list linking subject codes with individual names were kept in a separate electronic file on a password-protected computer or locked file accessible only to the PI and the research team. Confidentiality of the identity of individual participants was maintained and no subject names will be used in any publications.

Potential Risks. There was minimal risk as a result of participation in this research project. Participants were not asked to perform tasks beyond usual clinical activities. No invasive procedures were included in the study. Participants may have experienced some stress and anxiety during simulations. Support was provided during debriefing and was available following the simulation. Careful attention and training of the simulation team diminished this risk. Simulation participation was required for the course. Recording of the simulations was usual practice. Participants may have perceived a risk that by participation in the research may affect their clinical grade. The risk of this is extremely low, clinical and simulation faculty were not informed as to which students agreed to participate in the study.

Recruitment and Informed Consent. Participants for this study were recruited from prelicensure professional nursing programs in a Midwestern state. Programs indicating interest were contacted by the PI. Program curriculum was evaluated against inclusion and exclusion criteria. The PI met with potential participants in programs meeting inclusion and exclusion criteria to explain the study procedures and requirements to those who were eligible. Participation was voluntary. All participants signed a written

consent form which included the purpose of the study, anticipated numbers of participants, procedures, risks, benefits, and measures to protect confidentiality. Participants chosen for the study met with a member of the research team for written informed consent and collection of baseline data and commenced prior to clinical experiences. A small token (\$10 gift card) was given to students at time of recruitment.

Protection Against Risk. Potential risks were considered in the study design. All members of the research team were trained in procedures to respect the rights of human subjects, and there was special focus on issues related to protecting privacy and confidentiality in the orientation of the team. Confidentiality of the identity of participants was maintained. All identifying information that could be associated with a given individual was protected. All data, including demographic information, recordings, completed Lasater Clinical Judgment Rubrics and any other written notes were de-identified and coded. Research data were kept in a separate electronic file on a password-protected computer or locked file accessible and only the research team knew the identity of the subjects. List of names and associated codes was kept in a separate electronic file on a password-protected computer or locked file. No names will be used in any report. PI participated in ongoing training in responsible conduct of research and education related to human subjects. IRB from each participating institution had oversight.

Inclusion of Women. Nearly 93% of nurses (in the US and in Minnesota) are women (Robert Woods Johnson Foundation, 2010), therefore inclusion of women in this study was appropriate.

Inclusion of Minorities. Registered nurses in Minnesota are predominantly Caucasian and female. In 2011, 94% of Minnesota nurses identified themselves as white.

Two thirds of the nurses lived and worked in the metropolitan area. Hispanics, African Americans and American Indians are underrepresented in the Minnesota registered nurse population, 6% identified themselves as African American, Native American, Asian or multiracial. One percent identified themselves as Hispanic (MDH-ORHPC, 2012).

Inclusion of Children. Children were not included in this study, which focused on nursing students (adults).

Data Safety Monitoring Plan. The study protocol was submitted for full board review and approval to the Institutional Review Board of the University of North Dakota (Grand Forks) and each tertiary facility (college or university) from which potential participants were recruited. Full approval was received before implementation of any portion of the study. The investigators on this project acknowledge that robust safeguards are needed to ensure the rights and well-being of enrolled research participants is protected. The PI continuously monitored study implementation, and no unexpected events were reported by the research assistants.

Adverse Event Reporting. The PI assumed primary responsibility for data safety and subject monitoring on this protocol. The importance of adverse event reporting was included in the orientation and training of the research team members. No adverse events were reported.

Data Storage and Confidentiality. All of the research team had required Human Subjects Training established by the University prior to working with any participants or their data. All data collected as part of the study was treated as confidential and stored in a locked cabinet in a designated area. Electronic files were on a password-protected computer to maintain privacy in data access within the research team. To protect student

identity, all references to schools were de-identified in the dissertation and will be de-identified in presentations.

Summary

This chapter reviewed the research design, population and sample, measurement methods, data collection procedures, data analysis plan and plan for protection of human rights and data monitoring. An experimental design was used to determine if there are differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation as compared to hospital-based clinical experiences. The following chapter will discuss the results of the data analysis.

CHAPTER IV

RESULTS

Introduction

Tanner's Clinical Judgment Model (Tanner, 2006b) was used as the conceptual model for this study exploring the relationship between clinical experiences and clinical judgment (Tanner's Clinical Judgment Model see Figure 1).

The purpose of this study was to determine if there are differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation as compared to hospital-based clinical experiences. The specific aims of this study were as follows:

1. Are there differences in nursing students' clinical judgment in an evaluative simulation following participation in simulated maternal-newborn experiences as compared to hospital-based maternal-newborn clinical experiences?
2. Which of the following demographic characteristics (age, gender, race/ethnicity, type of nursing program attending, current employment status, highest degree earned, experience with pregnancy or childbirth outside nursing program requirements, and grade in didactic maternal-newborn course) are associated with clinical judgment scores in the evaluative simulation?

This chapter presents the results of this study, including general descriptive statistics of the sample characteristics followed by presentation of the statistical analyses that were completed to answer the specific aims as presented in chapter one. It concludes with a summary of the results. Data analysis was conducted to determine if there is a difference in clinical judgment, as measured by scores on the Lasater Clinical Judgment Rubric (LCJR) (Lasater, 2007a), between students participating in simulation as compared to hospital-based clinical experiences in the maternal-newborn clinical area.

Descriptive Statistics

A total of 71 students consented to participate in the study. Due to camera failure, nine of the evaluative simulations were not recorded. It was determined that these data were missing completely at random (MCAR) (M. El-Masri, personal communication, October 5, 2015). Therefore the data were deleted and complete case analysis was employed (Puma, Olsen, Bell, & Price, 2009; Osborne, 2013). A total of 62 student recordings of the evaluative simulation were included in the analysis for this study.

Gender

The sample population ($n = 62$) was predominantly female (77.4%, $n = 48$). Studies indicate that male RNs remain a minority, but the proportion of men in nursing is increasing. Between 2010 and 2013, 11% of the licensed RNs were male, whereas prior to the year 2000, only five percent of the licensed RNs were male (Budden et al., 2013). Figure 3 shows the percent of participants by gender in the sample, Minnesota (Minnesota Board of Nursing, 2015) and across the United States (HRSA, 2013).

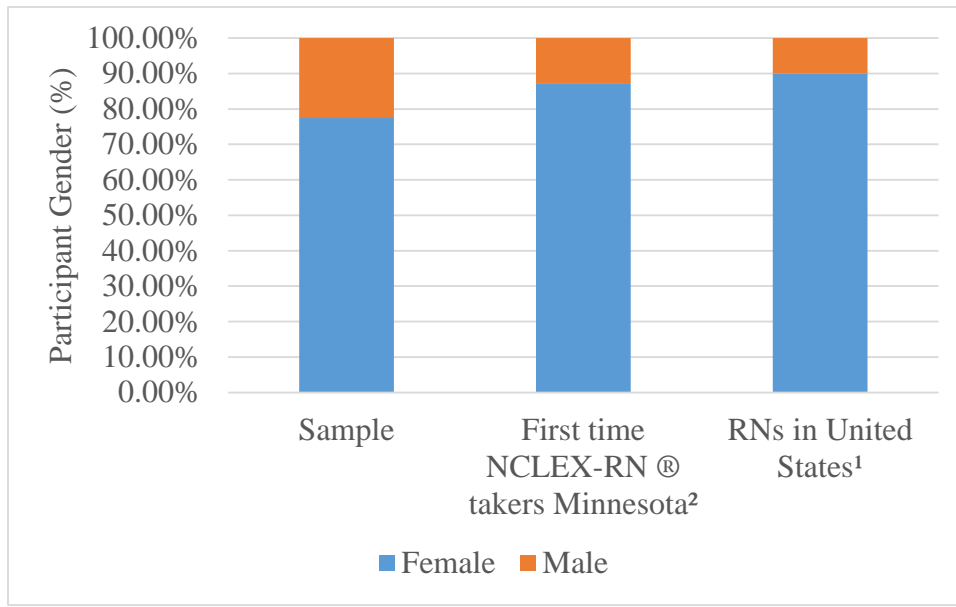


Figure 3. Gender of Sample, Population of Licensed Registered Nurses in Minnesota and in the United States

¹Health Resources and Services Administration (HRSA), 2013

²Minnesota Board of Nursing, 2015

Race and Ethnicity

Diversity in the nursing workforce is desired in order to improve access and quality of care for minorities and underserved populations (HRSA, 2013). The sample population was primarily White non-Hispanic (61.3%, n = 38). Twenty-three percent (n = 14) self-identified as black/African-American, 10% (n = 6) as Asian, three percent (n = 2) as Hispanic and three percent as other (n = 2). There were no Native Americans, Alaskan Natives, Hawaiians or Pacific Islanders in the sample population. Historically, nurses have been predominantly white, and that continues to be true, as seen in Figure 4.

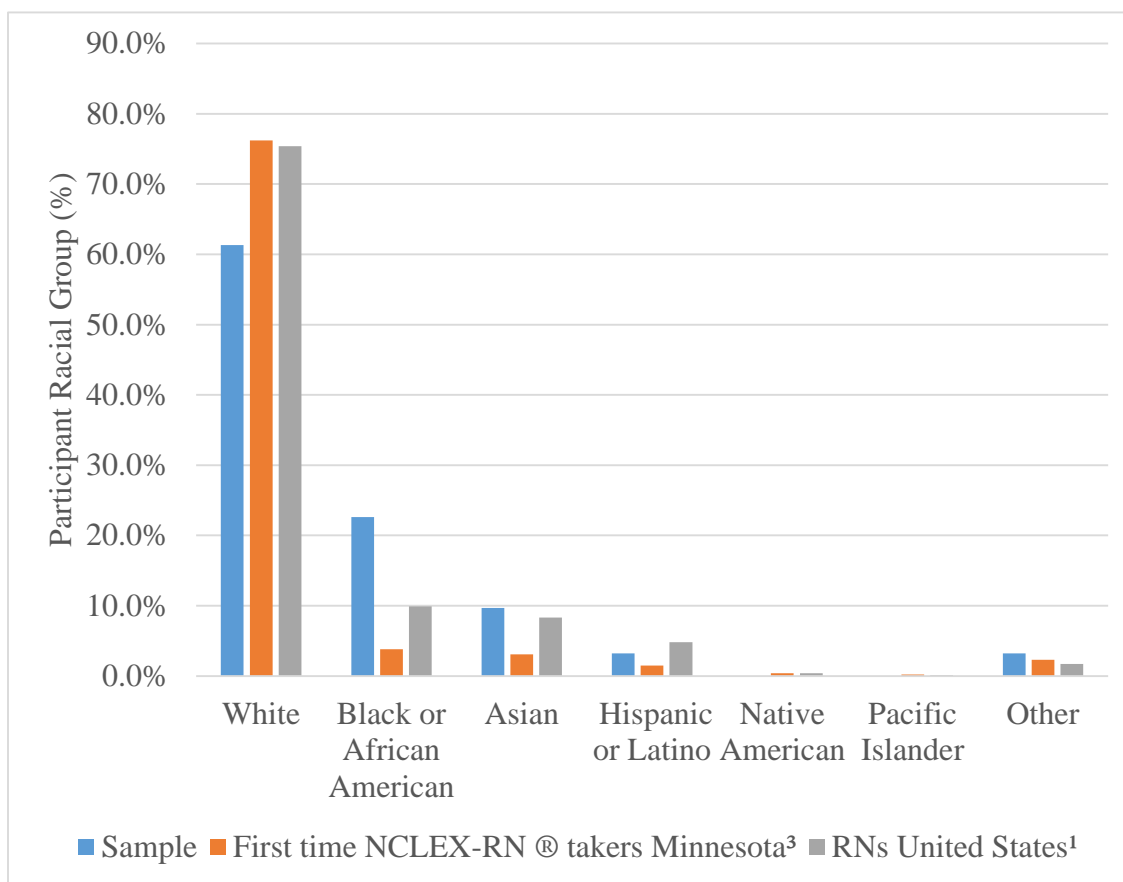


Figure 4. Race/Ethnicity of Sample, First Time NCLEX-RN® Takers in Minnesota and Population of Licensed RNs the United States

¹Health Resources and Services Administration (HRSA), 2013

²Minnesota Board of Nursing, 2015

Program Type

Seventy-six percent of the participants in the study (n = 47) were enrolled in an associate degree nursing program, and 24% (n = 15) were enrolled in a baccalaureate degree nursing program. Baccalaureate education is slowly growing to represent an increasing proportion. During the time period 2008 – 2010, approximately 44.6% of the nursing workforce held a baccalaureate degree as the highest degree (HRSA, 2013). In 2014, Minnesota reported approximately twice as many candidates for RN licensure had completed an ADN program (n = 1427) as compared to baccalaureate program (n = 765)

(Minnesota Board of Nursing, 2015). Figure 5 shows the percent of participants by program type in the sample, Minnesota (Minnesota Board of Nursing, 2015) and across the United States (HRSA, 2013).

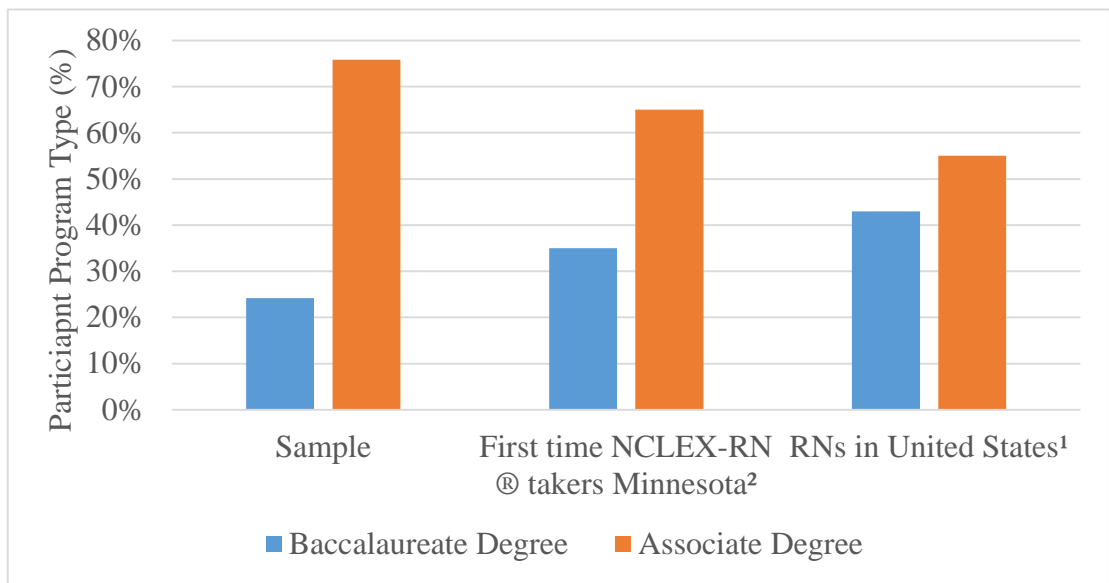


Figure 5. Program Type for Sample, Minnesota and United States

¹Kappel, Rego, & Grossenbacher, 2014

²Minnesota Board of Nursing, 2015

Age

The majority of the participants were between the ages of 25-34 (48%, n = 30) and 35.5% of participants (n = 22) were in the 18-24 year old category. 11.3% (n = 7) were between the ages of 33 and 44; and 5% (n = 3) were over the age of 44. The mean estimated age at graduation for the sample population is 29.3 years. In Minnesota, the average age at licensure is 26.2 years for BSN graduates and 32.5 years for ADN graduates. These numbers have remained relatively constant since 2010 (Minnesota Board of Nursing, 2015). The average age of nurses in the United States workforce is 44.6 years. The workforce is getting older, in the next 10 – 15 years, one third of the nursing workforce will reach retirement age (HRSA, 2013). However, workforce growth

is also concentrated at the younger end (35 and younger), demonstrating that young people continue to enter the nursing workforce (HRSA, 2013). Table 2 presents the demographic characteristics of professional nurse candidates for NCLEX in the United States, Minnesota and the sample population.

Table 2. Demographics of RN Workforce: comparison between Sample, United States and Minnesota

Characteristic	Sample [n (%)]	United States Licensed Registered Nurses	Minnesota first time test takers NCLEX-RN®, US Educated ³
Total	62	155,585 ²	3,075
Gender			
Male	14 (22.6%)	11.1% ¹	12.7%
Female	48 (77.4%)	90.9% ¹	87.3%
Race/Ethnicity			
White, non-Hispanic	38 (61.3%)	75.4% ¹	76.2%
Non-white	24 (38.6%)	24.7% ¹	10.7%
Asian	6 (9.7%)	8.3% ¹	3.1%
Black/African- American	14 (22.6%)	9.9% ¹	3.8%
Hispanic/Latino	2 (3.2%)	4.8% ¹	1.5%
Native American	0 (0%)	0.4% ¹	0.4%
Pacific Islander	0 (0%)	0.1% ¹	0.2%
Other	2 (3.2%)	1.7% ¹	1.9%
Program Type			
BSN	15 (24.2%)	43% ²	35%
ADN	47 (75.8%)	55% ²	65%
Mean Age (years)	29.26	44.6	BSN 26.2 ADN 32.5
	Estimated age at graduation	average age in workforce US ¹	

N = 62

¹Health Resources and Services Administration (HRSA), 2013

²Kappel, Rego, & Grossenbacher, 2014

³Minnesota Board of Nursing, 2015

Clinical Groups

Among the 62 students whose recordings were scored, 43.5% (n = 27) participated in simulation clinical experiences and 56.4% (n = 35) participated in

hospital-based maternal-newborn clinical experiences. Students were assigned to the clinical groups prior to consenting to participate in the study.

Chi squared analysis, a descriptive test that compares observed frequencies (sample) to expected frequencies (population), was completed to determine if the clinical groupings (simulation or hospital-based) were similar in demographics. Students self-reported age group, gender, race/ethnicity, highest degree earned, current employment status, and program type were included in the analysis. The groups were statistically different in nursing education program type (baccalaureate or associate degree) ($\chi^2 = 4.302$, $df = 1$, $p = 0.038$).

However, no statistically significant differences were found between the simulation and hospital-based clinical groups in other demographic data (age, gender, race/ethnicity, highest degree earned, and current employment status). Demographic data (unadjusted) of the participants by group (simulation or hospital-based) are presented in Table 3.

Table 3. Unadjusted Comparison of Demographic Characteristics Across Groups

Characteristic	Total sample (N = 62)		Hospital-based (n = 35)		Simulation (n = 27)		χ^2 (df)	<i>p</i>
	n	%	n	%	n	%		
Program Level							4.302 (1)	* 0.038
Baccalaureate	15	24.2	5	14.3	10	37.0		
Associate	47	75.8	30	85.7	17	63.0		
Age							3.552 (3)	0.314
18-24	22	35.5	10	28.6	12	44.4		
25-34	30	48.4	18	51.4	12	44.4		
35-44	7	11.3	4	11.4	3	11.1		
>44	3	4.8	3	8.6	0	0		

Table 3. Cont.

Characteristic	Total sample (N = 62)		Hospital-based (n = 35)		Simulation (n = 27)		χ^2 (df)	<i>p</i>
	n	%	n	%	n	%		
Gender							0.451 (1)	0.502
Female	48	77.4	26	74.3	22	81.5		
Male	14	22.6	9	25.7	5	18.5		
Race/ethnicity							4.965 (4)	0.291
Asian	6	9.7	4	11.4	2	7.4		
Black	14	22.6	9	25.7	5	18.5		
Hispanic/Latino	2	3.2	2	5.7	0	0		
Caucasian	38	61.3	18	51.4	20	74.1		
Other	2	3.2	2	5.7	0	0		
Highest Degree							3.599 (4)	0.463
High School	28	45.2	18	51.4	10	37.0		
Trade/Technical Associate Degree	7	11.3	2	5.7	5	18.5		
Baccalaureate Degree	16	25.8	8	22.9	8	29.6		
Other	9	14.5	6	17.1	3	11.1		
Other	2	3.2	1	2.9	1	3.7		
Employment							4.703 (5)	0.453
Employed	42	67.7	24	68.6	18	66.7		
Self-employed	5	8.1	4	11.4	1	3.7		
Out of work (looking)	1	1.6	0	0	1	3.7		
Out of work (not looking)	12	19.4	6	17.1	6	22.2		
Military	1	1.6	1	2.9	0	0		
Unable to work	1	1.6	0	0	1	3.7		
Experience with Pregnancy							1.909 (1)	0.167
No experience	40	64.5	20	57.1	20	74.1		
Experience	22	35.5	15	42.9	7	25.9		

N = 62, **p* < 0.05

Research Questions and Analysis

Differences in Clinical Judgment

The first research question examined whether or not there were differences in nursing students' clinical judgment in an evaluative simulation, as scored on the LCJR, (Lasater, 2007a) following completion of either simulation or hospital-based maternal-newborn clinical experiences. Only composite (total) scores were used in the data analysis. The range of possible composite scores on the LCJR is 4 – 44 (Lasater, 2007a). Overall, the LCJR scores ranged from 17 – 41 (Mean = 31.02, Standard Deviation = 6.21). For the participants in the hospital-based maternal-newborn clinical experience, the mean LCJR score was 30.29 ± 6.72 , slightly lower than the mean LCJR score for the participants in the simulation maternal-newborn clinical experience ($m = 31.963 \pm 5.44$). However, there was no significant difference in the LCJR composite scores between the two groups ($t = -1.056, p = 0.295$). Table 4 presents the difference in means of the two groups. Figure 6 shows the range of scores by group. These findings and the significance will be discussed in chapter five.

Table 4. Differences in Mean Scores on the Lasater Clinical Judgment Rubric (LCJR)

Variable	Mean LCJR Score	SD	Range	<i>t</i>	<i>p</i>
Hospital- based clinical experiences	30.29	6.72	17-41	-1.056	<i>p</i> = 0.295
Simulation clinical experiences	31.96	5.44	22-40		

N = 62 **p* < 0.05

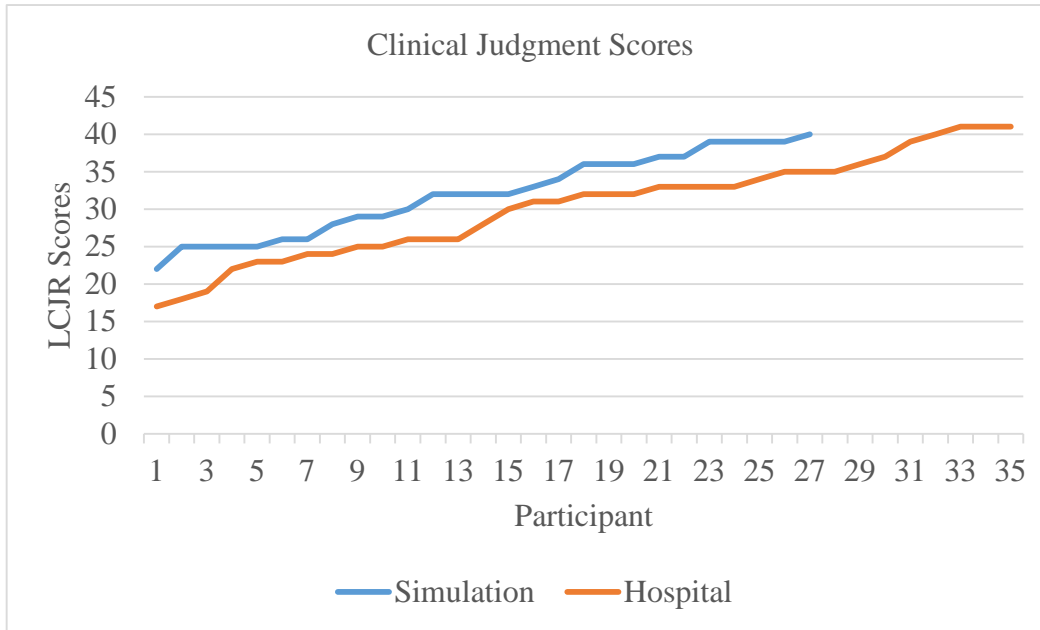


Figure 6. Range of Clinical Judgment Scores by Group. This figure shows individual scores by participant number, ordered by score, lowest to highest.

Magnitude indicates the strength of the relationship. Effect size is the most common measure of magnitude and reflects the impact variables have upon one another, most often expressed as small ($d = 0.1$), medium ($d = 0.5$) and large ($d \geq 0.8$). The effect size can be calculated in a variety of ways (Field, 2009; Pagano & Gauvreau, 2000). The effect size was calculated to be $d = -0.274$ using pooled standard deviation (M. El-Masri, personal communication, September 21, 2105). Therefore, it can be concluded that the magnitude of the relationship between clinical type and clinical judgment score is of small to medium effect. Post hoc achieved power was computed using G*Power 3 (Faul et al., 2007) and the following values: significance (α) = 0.05, and effect size $d = -0.274$. The achieved power of this study is 0.18. This is smaller than anticipated.

Relationship Between Demographic Characteristics and Clinical Judgment

The second research question was to determine which, if any, of the following demographic characteristics (age, gender, race/ethnicity, program type, highest degree earned, employment, grade in the maternal-newborn didactic course, and experience with pregnancy or childbirth) were associated with higher clinical judgment scores on the evaluative simulation. Three participants did not respond to three specific elements of the demographic data – highest degree, employment status and experience with pregnancy or childbirth. It was determined that these data were missing at random (MAR) (Puma et al., 2009; Osborne, 2013). Missing data were replaced using the collapsed characteristic that was most common (mode value) for that demographic variable (high school, employed and no experience with pregnancy/childbirth) (M. El-Masri, personal communication, October 5, 2015).

Associations between all demographic variables and the mean LCJR score were determined using chi square. Table 5 shows the correlations and significance of each of the demographic variables to the mean LCJR score. Large ($r > 0.5$) and significant ($p < 0.25$) correlations between demographic characteristics and the dependent variable (LCJR score) were identified. These demographic variables included race-ethnicity ($r = 0.508$, $p < 0.001$), employment ($r = 0.218$, $p = 0.048$), clinical type ($r = 0.129$, $p = 0.163$), program type ($r = 0.100$, $p = 0.217$), and grade in didactic maternal newborn (MNB) course ($F = 1.667$, $p = 0.110$).

Table 5. Unadjusted Relationships Between LCJR Score and Demographic Characteristics

Variable	LCJR Score M ± SD	r	p
Age Range		r = -0.075	p = 0.282
18-24	31.09 ± 5.76		
25-34	31.73 ± 6.65		
35-44	27.43 ± 5.29		
45 and over	31.67 ± 6.81		
Gender		r = -0.005	p = 0.485
Female	31.00 ± 5.98		
Male	31.07 ± 7.17		
Race/Ethnicity		r = 0.519	*p < 0.001
White	33.50 ± 5.11		
African American	25.86 ± 5.10		
Asian/Asian American	26.50 ± 6.03		
Hispanic/Latino	32.50 ± 0.71		
Other	32.00 ± 11.31		
Program Type		r = -0.115	p = 0.187
BSN	32.27 ± 5.55		
ADN	30.62 ± 6.41		
Highest degree earned		r = 0.207	p = 0.053
High School	29.73 ± 6.61		
Technical/Trade	33.14 ± 5.81		
Associate Degree	30.44 ± 5.84		
Baccalaureate Degree	35.22 ± 4.55		
Other	30.50 ± 9.19		
Employment		r = 0.228	*p = 0.037
Employed	30.05 ± 6.13		
Self-employed	33.80 ± 5.81		
Military	18.00		
Out of work (looking)	25.00		
Out of work (not looking)	35.00 ± 4.24		
Unable to work	36.00		
Experience with Pregnancy or Childbirth		r = 0.075	p = 0.282
No Experience	30.90 ± 5.25		
Experience	31.64 ± 7.76		
OB Grade		F = 1.667	p = 0.110

*r > 0.50, *p = <0.25

Checking Assumptions

Regression assumptions of normality, linearity and homoscedasticity were met. Durbin-Watson was used to determine whether the residuals in the model are independent, and the resulting value of 1.877 indicates residuals are independent (Field, 2009; Pagano & Gauvreau, 2000). Multicollinearity was assessed by reviewing the values for correlation ($r > 0.9$), variance inflation factor, indicating whether a predictor has a strong linear relationship with other predictors ($VIF < 10$), and tolerance statistics (> 0.2). Variable values were $r < 0.6$, tolerance > 0.5 and $VIF < 2$. The average $VIF = 1.3782$, verifying there is no multicollinearity (Field, 2009). Figures 7 and 8 show a comparison of residuals as a random array of dots evenly dispersed around zero. The assumptions of homoscedasticity and linearity seem to have been met so we can assume the model can be generalized to the population (Field, 2009; Pagano & Gauvreau, 2000).

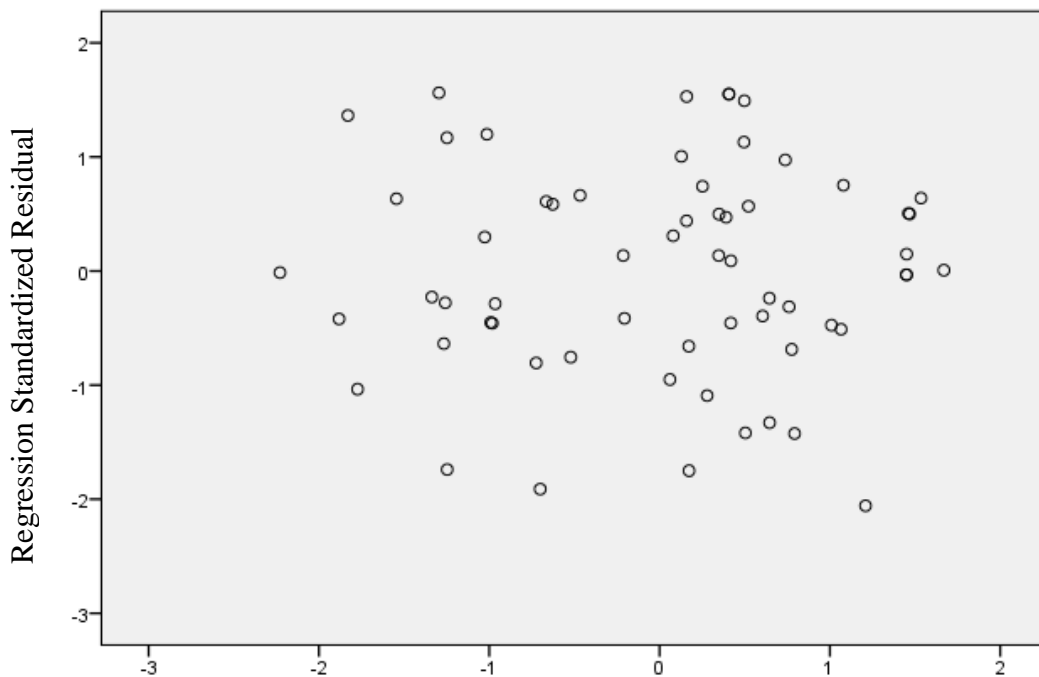


Figure 7. Standardized Residuals versus Standardized Predicted Values: Dependent Variable: LCJR Score.

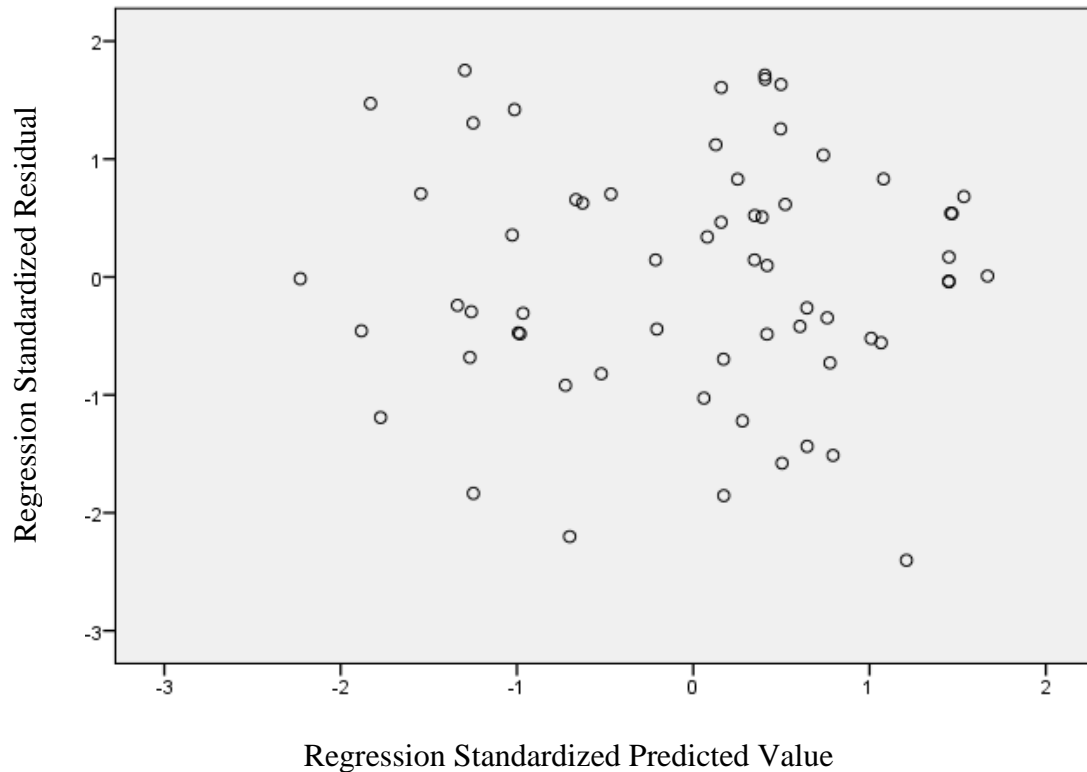


Figure 8. Regression Standardized Predicted Value versus Regression Studentized Residual: Dependent Variable: LCRJ Score.

Recoding Demographic Variables

Demographic variable frequencies were reviewed and four variables (race/ethnicity, age, highest degree, employment status) were identified to have categories with low numbers. Because data analysis would be affected by these low numbers, the decision was made to collapse specific categories to allow for better data analysis (Field, 2009). The following will describe the variables, initial categories and how the category collapse was implemented.

Age. With the intention of gathering data representing the diversity of ages of nursing students, four categories of age were identified on the demographic information

questionnaire: 18-24 years, 25-34 years, 35-44 years, and 45 years or older. Only three individuals were 45 years or older, so the decision was made to include those three individuals in a newly created category of 35 years and older.

Highest Degree Earned (Educational Background). In order to gather data on the breadth of educational background of participants, initially there were five categories of highest educational degree earned. Forty-five percent of the participants (n = 28) marked high school as the highest degree completed, 16 participants completed an associate degree, nine earned baccalaureate degrees, seven had technical or trade school certificates, two had a master's degree and two marked the category other. Because a large proportion of the participants were high school graduates and the identified post-secondary education degrees each had lower numbers, the decision was made to collapse this variable into two categories: high school graduate and post-secondary education.

Employment. Initially the current employment status variable had seven categories with various categories for employment (self-employed, military) and unemployment (not working and looking, not working and not looking, unable to work, retired). The decision was made to collapse this variable into two categories of employed and unemployed.

Race/Ethnicity. In an effort to represent the diversity of race and ethnicity in the nursing population, initially seven categories of race/ethnicity were identified. Thirty-eight participants self-identified as White, 14 as Black or African American, two as Hispanic, six Asian or Asian American, and two "other race/ethnicity". Unfortunately in the sample there were no participants who indicated they were American Indian or Alaskan Native, Hawaiian or Pacific Islander. Low numbers (<5) were identified in

several categories, which would impact the regression analysis. Therefore, a decision was made to collapse the variable into three specific categories: (1) White, (2) Black or African American, and (3) Other Race/Ethnicity, in order to ensure sufficient number of participants in each category of the variable for analysis.

Dummy Variables. Dummy (or indicator) variables are a means of recoding a categorical variable with more than two categories into a series of dichotomous variables (Field, 2009; Pagano & Gauvreau, 2000). After completing the process to collapse the race/ethnicity variable into three categories, dummy variables were created to enter into the regression model. Following the usual process, the three categories of race/ethnicity were recoded into two new race/ethnicity variables (M. El-Masri, personal communication, October 14, 2015). The category (White) had the greatest number of participants, was chosen to be the reference category. A new variable (White vs. African American) was created by coding African American as 1 and all others as 0, thus accurately representing the African American category. The same process was used to create a new variable (White vs. Other Race/Ethnicity) for the participants in the collapsed “Other Race/Ethnicity” category.

This collapse and dummy coding resulted in variables with two categories. The data for these variables were entered into the regression model. A statistician was consulted to review and verify the category collapse and dummy coding (M. El-Masri, personal communication, October 14, 2015).

Factors Relating to Clinical Judgment

The five demographic variables that had statistically significant correlation included clinical type, program type, grade in didactic maternal newborn (MNB) course,

employment status and race-ethnicity. Following the collapse and dummy recoding described above, these variables were entered into a multiple linear regression model to determine if any of the demographic variables influenced the LCJR scores. A multiple regression analysis was carried out to estimate the variance in clinical judgment by demographic variables. Together, these five variables explained 33.0% of the variance in LCJR scores.

Table 6. Linear Regression using Adjusted Significant Demographic Variables

	<i>b</i>	SE <i>b</i>	β	<i>t</i>	<i>p</i>
Model 1					
Constant	31.963	1.193		26.790	<i>p</i> < 0.001
Clinical Type	-1.667	1.588	-0.135	-1.056	<i>p</i> = 0.295
Model 2					
Constant	36.995	11.706		3.160	<i>p</i> = 0.003
Clinical Type	-0.534	1.456	-0.043	-0.367	<i>p</i> = 0.715
White vs. African American	-8.148	1.795	-0.553	-4.539	* <i>p</i> < 0.001
White vs. Other Ethnicities	-4.978	2.033	-0.297	-2.449	* <i>p</i> = 0.018
Employed	-3.438	1.682	-0.234	-2.044	* <i>p</i> = 0.046
Program Type	-2.814	2.051	-0.196	-1.372	<i>p</i> = 0.176
Grade in Didactic MNB Course	0.004	0.144	0.003	0.026	<i>p</i> = 0.979

$R^2 = 0.018$ for Step 1, $\Delta R^2 = 0.331$ for Step 2 ($p < 0.001$). * $p < 0.05$

Regarding effect size, when the variables grade in MNB course, race/ethnicity, employment, and program type were added to the model, the predictability increased ($R^2 = 0.330$), and the resulting change ($\Delta R^2 = 0.311$) indicates 31.1% of the variance in clinical judgment scores can be accounted for by these variables. The inclusion of these predictors explains a significant variation in clinical judgment scores (F Change = 5.604, $df_1 = 5$, $df_2 = 55$, $p < 0.001$). Three variables with significant correlation to clinical

judgment (clinical type, program type and grade in the MNB course) did not make significant contribution to the score on the second model. Two variables were significant predictors: race/ethnicity and employment status. Table 6 shows the regression data for these significant and highly correlated variables.

Significant Predictors

Race/ethnicity makes the most significant contribution to the model. The variable White vs. African Americans had the most significant contribution to the variation in scores ($b = -8.148$, $\beta = -0.553$, $t = -4.539$ $p < 0.001$). The confidence interval (CI) for White vs. African American is -11.75 to -4.55. The variable White vs. other ethnicities also made a significant contribution ($b = -4.978$, $\beta = -0.297$, $t = -2.449$ $p = 0.018$). The confidence interval (CI) for this group is -9.05 – -0.91. The confidence interval is tight and does not cross zero, indicating that it is likely to be representative of the true population values (Field, 2009; Pagano & Gauvreau, 2000). White participant were more likely than African Americans and people of other ethnicities to have a higher score on the LCJR.

Participant employment status also made a significant contribution to the model ($b = -3.438$, $\beta = -0.234$, $t = -2.044$, $p = 0.046$). The confidence interval for employment is also tight (CI = -6.808, -0.067), and does not cross zero, indicating the parameter for employment is likely to be representative of the true population (Field, 2009; Pagano & Gauvreau, 2000). Employed participants were more likely to have lower clinical judgment scores than those participants who were unemployed.

Summary

There was no statistically significant difference in clinical judgment for nursing students participating in simulation maternal-newborn clinical experiences as compared to hospital-based clinical experiences ($t = -1.056, p = 0.295$). When comparing demographic variables to the clinical judgment, several factors were found to be related to clinical judgment. Clinical type, race/ethnicity, current employment status, program type and grade in the didactic maternal-newborn course had significant relationships with clinical judgment. No significant relationship was found between clinical judgment and the other demographic characteristics (age, gender, highest degree earned, and previous experience with pregnancy or childbirth). However, in multivariate analysis, race/ethnicity and current employment explained significant variance in clinical judgment, beyond what was explained by program type, and grade in the didactic maternal-newborn course. The results of this dissertation study indicate that simulation maternal-newborn clinical experiences are as effective in promoting clinical judgment as the hospital-based clinical experiences. The following chapter will discuss the implications of the research findings.

CHAPTER V

DISCUSSION

Introduction

This chapter includes a discussion of the results of the statistical analysis described in chapter four. Following a brief summary of the overall study, the results of the research will be discussed within the context of current literature and utilizing Tanner's Clinical Judgment Model (Tanner, 2006b) as the framework. Areas of discussion include: overall discussion of clinical judgment; discussion of the analysis of relationships with clinical judgment; and discussion of the variables with significant relationships with clinical judgment. Limitations of the study, implications for nursing education, including the significance to nursing research and recommendations for further research will be explored.

Summary of the Research Study

Purpose and Aims of the Study

Providing high quality clinical experiences for nursing students has been a challenge in recent years. The ability to secure appropriate clinical sites for student learning stems from both the clinical and academic sides. Clinical sites limit student learning opportunities due to high patient acuity, short patient stays, and concerns related to patient privacy and patient safety. Academic institutions are challenged with limited availability of qualified nursing faculty, increasing number of programs competing for

the same clinical sites, and the amount of time clinical instructors are able spend in direct supervision of students (Harrison, 2004; Hayden et al., 2014; Hutchings et al., 2005; IOM, 2011; Pauly-O'Neill et al., 2013). High-fidelity simulation allows educators to replicate many patient situations and provide students with opportunities to practice and hone their cognitive, psychomotor and critical thinking skills (Hayden et al., 2014; Jeffries & Rizzolo, 2007; Nehring, 2008).

Nurses are expected to provide safe and quality care to all patients for whom they care (IOM, 2011). Good clinical judgment is the keystone to quality patient care. New graduate nurses are expected to provide safe patient care. Nursing education has the responsibility for preparing these new graduates for their role in the workplace upon graduation (Benner et al., 2009; IOM, 2011). Didactic coursework provides the content knowledge and skills, while clinical experiences allow students to demonstrate their ability to integrate learning into the practice setting. Simulation allows students to practice these skills in an environment that eliminates the risk of injury and enhances learning (Hovancsek, 2007).

The purpose of this study was to determine if there are differences in clinical judgment among nursing students in a maternal-newborn clinical course participating in simulation as compared to hospital-based clinical experiences. The aims of the study included: (1) determine if there are differences in nursing students' ability to demonstrate clinical judgment in an evaluative simulation following participation in simulated maternal-newborn clinical experiences as compared to hospital-based maternal-newborn clinical experiences and (2) identify which of the following demographic characteristics (age, gender, race/ethnicity, type of nursing program attending, current employment

status, highest degree earned, experience with pregnancy or childbirth outside nursing program requirements, and grade in didactic maternal-newborn course) are associated with clinical judgment scores in the evaluative simulation.

Additional evidence is needed to show the effectiveness of simulation as a replacement for hospital-based clinical experiences used to promote the development of clinical judgment. Results of this study will help establish best practices for nursing education concerning the use of simulation experiences for maternal-newborn and other specialty clinical experiences.

Methods

An experimental study was conducted to examine the relationship between clinical experiences and clinical judgment in professional nursing students completing a maternal-newborn clinical course. Inquiries to identify prelicensure professional nursing programs using both hospital-based and high-fidelity simulation in the maternal-newborn clinical course continued for two years. Leadership from programs identified as meeting the requirements were consulted and discussions to determine the fit between the program and research study ensued. Two programs agreed to allow recruitment from the maternal-newborn clinical course and met the program inclusion and exclusion criteria. Students enrolled in the maternal-newborn clinical course and who met the inclusion criteria provided consent and completed a survey including questions about their demographic characteristics. Participants were required to complete the assigned clinical experiences. The final evaluative simulation was the culminating assigned clinical experience. Recordings of the participants' final evaluative simulation were viewed by the PI and scored on the Lasater Clinical Judgment Rubric (LCJR).

Tanner's Clinical Judgment Model

Tanner's Clinical Judgment Model (Tanner, 2006b) was utilized as a framework for this study. Tanner's model of clinical judgment includes four dimensions (noticing, interpreting, responding and reflecting) through which the nurse identifies the concern and intervenes to facilitate achievement of the goals set between the nurse and the patient (Tanner, 2006b). Lasater's Clinical Judgment Rubric (LCJR), based on Tanner's model, was used to evaluate clinical judgment of each participant in the recorded evaluative maternal-newborn simulation.

Differences in Clinical Judgment

Clinical judgment scores for participants in the simulation maternal-newborn clinical experiences ($M = 31.96$, $SD = 5.44$) were not statistically different from the scores for participants in the hospital-based maternal-newborn clinical experiences ($M = 30.29$, $SD = 6.72$) ($t = -1.056$, $p = 0.295$). It appears participating in simulation clinical experiences is equally effective in promoting clinical judgment in the maternal-newborn clinical area. Other studies comparing simulation to hospital-based clinical experiences report similar results for the end of the term evaluations of clinical judgment (Hayden et al., 2014; Meyer et al., 2011; Schlairet & Fenster, 2012; Watson et al., 2012).

Clinical Judgment Findings related to Literature

Few published studies comparing simulation to clinical experiences were found. All studies replaced a portion of the clinical experience with simulation, slightly different from this dissertation study that replaced simulation for all clinical hours for one group of students. However, no significant differences were noted in clinical judgment (competence) for students participating in simulation for 25% of clinical time (Meyer et

al., 2011; Watson et al., 2012). Schlairet and Fenster (2012) reported significant difference between students who participated in 30% simulation replacement for clinical compared to students in groups with 0%, 50%, or 70% simulation replacement. However, they also reported no significant differences were found among the remaining seven groups. Finally, Hayden and colleagues (2014) conducted a multi-site longitudinal study investigating, among other things, differences in clinical judgment of nursing students when hospital-based clinical experiences are replaced by simulation in various amounts (10%, 25%, & 50%). The analysis of the final clinical judgment scores during the maternal-newborn course indicated the control group (10% simulation) had a statistically significant higher score than the 25% and 50% groups ($p = 0.022$). However, these researchers noted that the mean scores for all groups at the completion of the maternal-newborn course were greater than 94%, indicating all groups demonstrated clinical competency (Hayden et al., 2014).

It is important to mention some differences between the studies reviewed. Watson and colleagues (2012) studied physiotherapy students and the 25% clinical replacement was 2 days of an 8 day clinical rotation while Meyer and colleagues studied nursing students in a pediatric clinical course and the 25% clinical replacement was 2 of 8 weeks. Schlairet and Fenster (2012) reported a small sample size. These must be considered when making comparisons between these studies.

In addition to the time spent in simulation, the quality of the clinical experiences must also be considered. Ensuring that clinical experiences are supervised by qualified nurse educators, that students receive timely and specific feedback, and the opportunity to meet course objectives must be considered. Each of these studies employed a framework

for simulation that guided the simulations. This dissertation study and the National Council of State Boards of Nursing Simulation Study (Hayden et al., 2014) utilized the INACSL Standards of Best Practices: including professional integrity of the participants; participant objectives; faculty members (facilitators) with training and experience in simulation; space, equipment and supplies to create a realistic environment that mirrors the clinical setting; faculty content experts to create and implement theory based simulations and debriefing (INACSL Board of Directors, 2013). Meyer, and colleagues (2011) employed the Nursing Education Simulation Framework (Jeffries, 2007) to design and implement the pediatric simulation curriculum. Utilizing evidence based best practices in simulation programs will ensure high quality learning opportunities for students.

Each of the studies noted that while the results provide evidence that replacing a portion of clinical education with simulation is a viable clinical option and does not appear to compromise students' ability to achieve professional competencies, simulation should not totally replace clinical experiences with real patients. This dissertation study results are congruent with other studies that replace clinical experiences with simulation, providing further evidence that simulation may be an effective replacement for hospital-based clinical experiences in the maternal-newborn clinical area, if the simulation educational environment is comparable to the study environment.

Demographic Characteristics Associated with Clinical Judgment

The second specific aim was to determine which demographic characteristics (age, gender, race/ethnicity, type of nursing program, current employment status, highest degree earned, grade in didactic maternal-newborn (MNB) course, and experience with

pregnancy or childbirth) are associated with clinical judgment scores in the evaluative simulation. Five demographic variables were determined to have statistically significant correlation to the clinical judgment scores: clinical type, type of nursing program, grade in didactic (MNB) course, current employment status and race-ethnicity. Two of these variables were significant predictors: current employment status ($p = 0.046$) and race/ethnicity, ($p < 0.019$). White, non-Hispanic participants (reference variable) scored significantly higher on clinical judgment than African-American participants ($b = -8.148$, $\beta = -0.553$, $t = -4.539$ $p < 0.001$) and participants of other ethnicities ($b = -4.978$, $\beta = -0.297$, $t = -2.449$ $p = 0.018$). Employed participants scored significantly lower on clinical judgment than participants who were not employed ($b = -3.438$, $SEb = 1.682$, $p = 0.046$). Other studies have similar findings.

Demographic Characteristics and Clinical Judgment: Findings in the Literature

Other covariates were reported in a few studies of clinical judgment (Hayden et al., 2014; Meyer et al., 2011; Schlairet & Fenster, 2012; Watson et al., 2012). Variables such as age, gender, ethnicity, work experience, experience working in healthcare, and highest degree earned were most common variables reported. Other variables reported include English as first language, first in family to go to college, as well as specific information related to the clinical site and time. Demographic characteristics, including employment, and race/ethnicity will be discussed.

Employment

It has been hypothesized that employment experience has an impact on clinical judgment and decision-making (Klein, 1999). Of the studies reviewed, only one included the variable of employment status in the analysis. Meyer, and colleagues (2011) found no

significant effect when considering the variable of prior healthcare work experience ($p = 0.78$). In this dissertation study employment status had a significant inverse effect on the clinical judgment score ($b = -3.438$, $SEb = 1.682$, $p = 0.046$). Several factors may impact these results. The majority of participants in this study (64.5%) were over the age of 25, with a mean estimated age of 29 years, no longer eligible for insurance coverage under their parents' policy. Approximately 55% of the participants had a post-secondary degree, impacting their eligibility for scholarships and grants. Almost 36% had personal experience with pregnancy/childbirth, indicating approximately one third may have had family obligations. All these factors could potentially lead to a student choosing to work close to full time hours in addition to the commitment of the nursing program.

Scheduling work, program clinical and classroom expectations may impact the student's study and clinical preparation time, and self-care behaviors, and interfering with their performance. Further research on the impact of work experience, within or outside the healthcare environment is needed.

Race/Ethnicity

The nursing workforce is becoming more diverse in terms of race and ethnicity (HRSA, 2013). Nursing programs are enrolling an increasingly diverse student population as well. In this dissertation study, ethnicity made a significant contribution to the variance in clinical judgment scores. White, non-Hispanic participants scored higher when compared to African Americans ($b = -8.148$, $\beta = -0.553$, $t = -4.539$ $p < 0.001$) and other ethnicities ($b = -4.978$, $\beta = -0.297$, $t = -2.449$ $p = 0.018$). Schlairet and Fenster (2012) reported no significant correlations between demographic variables, including ethnicity and total scores on the LCRJ without controlling for design schema (interleaved

versus blocked). However, the authors did report significant differences in LCJR total score by design schema and ethnicity ($F(6,63) = 9.97, p < 0.001$), estimating 49% of the variance in LCRJ scores was explained by design schema and ethnicity. Higher scores were reported for White, non-Hispanic students ($b = 1.56, t = 2.5, p = 0.015$) (Schlairet & Fenster, 2012). Hayden and colleagues (2014) reported 16% of the participants were of non-white race/ethnicity. They reported a statistically significant difference between groups for the number of Hispanic participants. However, the study did not report differences in outcomes based on race/ethnicity (Hayden et al., 2014). Watson and colleagues (2012) reported demographics related to ethnicity, but the relationship to clinical judgment was not reported. It may be that simulation and other aspects of the educational program do not match the learning needs/styles of this ethnically diverse population. Further research in this area is needed to balance the educational needs of the students and the opportunities for clinical learning.

Other Demographic Variables

Other demographic variables (gender, highest degree earned, program type and grade in didactic MNB course) were considered in this study, however, none were found to have significant impact on clinical judgment. Wolfgram and Quinn (2012) reported an increase in theory examination scores for students who participated in simulation. Meyer, and colleagues (2011) reported the covariate effects of work experience ($p = 0.78$), and gender ($p = 0.45$) had no effect on overall performance. Hayden reported only that groups were similar in demographic characteristics, except for Hispanic ethnicity as noted previously (Hayden et al., 2014). Schlairet and Fenster (2012) reported no significant

differences in relation to demographic characteristics using chi-squared analysis. Some variable merit additional discussion.

Previous Experience

Several studies collected data related to previous work experience in healthcare and this dissertation study asked specifically about previous experience with pregnancy and childbirth. Several studies reported no significant differences when work experience in the healthcare setting (nursing assistant) was considered in the model for clinical judgment (Hayden et al., 2014; Meyer et al., 2011). In this study there was no correlation between clinical judgment and previous experience with pregnancy and childbirth.

Program Type: Associate Degree and Baccalaureate Degree

Evidence that there is a link between quality of care provided and nursing education level remains equivocal (Blegen, Goode, Park, Vaughn, & Spetz, 2013). The report on the *Future of Nursing* (IOM, 2011), recommends increasing the proportion of baccalaureate prepared nurses to 80% by the year 2020. Some literature supports baccalaureate educated nurses significantly influencing the care provided (Benner et al., 2009; Blegen et al., 2013), however, other studies have not found significant relationships between patient outcomes and nursing education level (Blegen, Vaughn, & Goode, 2001; Ridley, 2008). Most studies reviewed were conducted within a single program type, so information on the differences between associate degree and baccalaureate degree students' clinical judgment is lacking (Meyer et al., 2011; Schlairet & Fenster, 2012; Watson et al., 2012). Hayden and colleagues (2014) recruited from both associate degree (5 programs) and baccalaureate degree (5 programs) nursing programs (p. S6), but did not report differences in outcomes with regard to program type. Jensen (2013) reported a

statistically significant difference in students' clinical judgment scores on the LCJR based on program type, with baccalaureate students mean scores greater than associate degree students. However, the researchers note the small sample size may have influenced this outcome. In this dissertation study, there was a statistically significant difference in the sample with regard to program type. The simulation clinical group had more BSN students ($n = 10, 37\%$) than the hospital-based clinical group ($n = 5, 14.3\%$). Chi-squared analysis determined this to be significantly different ($\chi^2(df) = 4.302(1), p = 0.038$) but there was no significant difference in clinical judgment scores between these two groups ($t = 0.895, df(60), p = 0.374$). These findings may be due to the novice level of these students being equivalent, all participants in this study were scheduled to graduate after one additional semester of the nursing program. Further research is needed in this area.

Limitations

All studies have limitations. Limitations impact the generalizability of the study results and are important to acknowledge. The following limitations have been identified for this study as well as the process used to minimize them.

Recruitment

Despite the increase use of simulation in nursing programs (Hayden, 2010; Katz, Peifer, & Armstrong, 2010), recruitment challenges existed for this study. It took 18 months to locate and confirm involvement from two nursing program, providing sufficient recruitment to reach the estimated sample size (58 participants). During that time, the PI met with several nursing program administrators to discuss the study questions, program requirements, and inclusion and exclusion criteria. Some programs

were not using simulation at all and those that were, did not use it in a consistent manner. Many programs reported that simulation was done on a case-by-case basis by the faculty teaching the content. Few programs reported faculty or simulation center staff that were adequately prepared to join the research team, and either faculty did not have time or interest in gaining the expertise or the program did not have resources to support additional preparation. Some programs reported having the equipment (high fidelity simulators, academic electronic health record, etc.) but faculty did not have the expertise in using these technologies. Not every school had a clear division between those participating in simulation and those participating in hospital-based clinical. Students often participated in both, and frequently at different times during the clinical course, which did not meet study design requirements. Ultimately, two programs were identified as using both simulation and hospital-based clinical experiences in a maternal-newborn course and in which students participated in either simulation or hospital-based clinical experiences, but not both. However, the programs student population was representative of prelicensure nursing programs in Minnesota and across the United States.

Group Assignment

Group assignment to those clinical experiences was also a limitation. Program curriculum and registration processes were already established for the two programs that met the criteria and agreed to allow recruitment. Students registered for the clinical course section based on time and location preferences. In one program students were asked to choose between maternal-newborn or pediatric clinical experiences for simulation and were assigned to the other area for hospital-based experiences. This may have influenced the difference in groups (more BSN students in the Simulation Group) as

noted in chapter three. In the other program, students were accepted into either the day (Monday – Friday, daytime classroom and clinical hours) or the evening/weekend program (Monday – Friday evening classroom and evening or weekend clinical hours). Group assignment to simulation or hospital-based clinical experiences was not random. However, with the exception of program type, the groups were similar in demographics as discussed previously, and the sample as a whole was representative of students in prelicensure nursing programs in Minnesota and the United States.

Use of Best Practices in Simulation

The simulation programs participating in this study did not use a formal simulation framework to develop the simulation experiences. However, the PI reviewed the simulation program and experiences against the Standards of Best Practices: Simulation (INACSL Board of Directors, 2013) and found them to align with these best practices. It is important to consider best practices and standards in the planning of simulation experiences.

Implications for Nursing Education

The results of this study add to the body of literature in nursing education. There were no significant differences among the study groups regarding clinical judgment. Although this study had limitations, as do all studies, it provides strong evidence for the use of simulation as a replacement for hospital-based clinical experiences for the maternal-newborn clinical area if the simulation educational environment is comparable to the study environment. Arranging clinical experiences in the maternal-newborn clinical area will continue to be a challenge. The perceived increased workload for staff when facilitating student experiences in the hospital-based clinical environment (Hathorn

et al., 2009), litigious nature of environments such as intensive care and maternal-newborn units (Mahlmeister, 2008), the increasing numbers of men in nursing (Budden et al., 2013) and the reports of gender bias (Cudé & Winfrey, 2007) also warrant alternative clinical opportunities for maternal-newborn clinical learning. Educators are challenged with ensuring that students have an opportunity to meet specific maternal-newborn learning objectives, such as experiencing the entire birth process, caring for a woman in labor or in the immediately post-partum, and caring for and assessing a neonate (Sittner et al., 2013), simulation will allow for these learning opportunities to be available for every student.

The diversity of program type, representing both associate and baccalaureate degree nursing programs, was a strength of this study. The sample diversity represented the population of new graduates in Minnesota and nurses across the United States. The demographic characteristics across the two groups were consistent with the exception of program type. However, the relationship between some demographic characteristics, specifically race/ethnicity and employment in this study, indicate the possibility that either simulation may not be suitable for all students or the rubric may be biased.

The sample provided small to medium effect size ($d = -0.271$) to determine statistical significance. This is smaller than anticipated. The differences were nominal and the power was calculated as 0.18 (Faul et al., 2007) indicating the results should be interpreted carefully.

Nursing programs looking to implement simulation as a replacement for clinical experiences will need to ensure adequate resources are available. This includes, but is not limited to physical resources (simulation center space, manikins of appropriate number

and fidelity, other supplies and equipment to mirror the clinical environment such as medication dispensing systems, IV pumps and other medication administration supplies, phones, beds), technology (such as audio and visual recording and playback equipment, electronic health records, Vocera[®] or other communication devices) and human resources (faculty and simulation technicians) to support the educational environment. These are costly to acquire and maintain to the degree necessary to mirror the clinical environment.

This study provides evidence that simulation can effectively be used to replace hospital-based clinical experiences and adds to the growing body of knowledge about replacing clinical experiences with simulation. However, there is a need for more research to identify best practices in nursing education.

Recommendations for Further Research

The published research on the use of simulation as a teaching strategy in healthcare education is growing. Further research to identify best practices in nursing clinical education and simulation, teaching strategies that foster development of clinical judgment and instruments that measure the complex nature of clinical judgment are needed.

Simulation cannot be used to replace every clinical experience. Student nurses must have experiences working with real individuals across the health-wellness continuum and developmental lifespan. Further research is needed to identify specific student outcomes best be met with simulation learning experiences and outcomes ideally met by interacting with live individuals in the clinical setting is important.

The simulation educational environment is critical to the success of a simulation program (INACSL Board of Directors, 2013). The availability and cost of physical,

human resources required to carry out high-fidelity simulations is significant. Further research into the level of fidelity necessary for specific learning outcome achievement will help nursing programs prioritize and develop their simulation programs while maintaining the quality of education.

Significant differences were found related to race/ethnicity and employment status. However, no causal relationship could be determined. Further research is needed to assess if the differences noted in these areas are due to instrument bias, or real learning differences. The implications for nursing education related to these differences must be addressed.

Transfer of learning and competence demonstrated from simulation to the clinical practice has not been adequately documented (Foronda et al., 2013, Rutherford-Hemming, 2012; Sears, Goldsworthy & Goodman, 2010; Sportsman, Schumacker, & Hamilton, 2011) although this concern is beginning to be address in the literature for nursing (Hansen & Bratt, 2015; Hayden et al., 2014) and medicine (McGaghie, Issenberg, Petrusa, & Scalese, 2010). Hayden and colleagues (2014) reported nurse manager ratings of study participants employed as new graduates. After 6 months of employment as a registered nurse participants in the three groups continued to show no significant difference in clinical judgment ratings. Additional longitudinal research to measure differences between simulation and clinical experiences with regard to knowledge acquisition, clinical judgment, and transferability to practice is needed.

The literature is beginning to address the areas of debriefing as it related to fostering clinical judgment in simulation. Clinical “post-conferences” and simulation debriefings are similar in concept, but there is little research comparing the effectiveness

and making recommendations for implementation of debriefing methods in the clinical setting is needed.

Conclusion

This study provides evidence that simulation, as described in this study, is an effective replacement for hospital-based clinical experiences in the maternal-newborn clinical area. Specific conditions used in this study include faculty with experience and training in simulation as a teaching strategy to ensure best practices (INACSL Board of Directors, 2013) are implemented, adequate resources (human and physical) to support learners and create a realistic environment, and content experts to ensure simulations and debriefing is evidence-based. This study supports the use of simulation for high-risk, low-frequency clinical situations or those experiences in the clinical area that are often unpredictable, as often is seen in the maternal-newborn clinical area. Careful consideration is needed to determine which clinical experiences are best completed with real patients and which are best replaced with simulation. The most significant finding in this study is that both clinical and simulation teaching strategies, when implemented in a structured manner, are effective means of achieving excellent student outcomes.

APPENDICES

APPENDIX A

Dear Nursing Program Director,

I am writing to ask for your help in identifying nursing programs with clinical experiences in the maternal-newborn specialty area utilizing traditional hospital-based clinical experiences or simulation. I ask that you please read the following overview of the study, identify if your program meets the criteria, and contact me if you have questions or think your program is appropriate for the study.

I am conducting research to examine if nursing student participation in maternal-newborn clinical experiences using high fidelity simulation yields a level of clinical judgment that is comparable to those who participate in traditional hospital-based clinical experiences. A group of 50 students is needed for my dissertation study, 25 participating in only simulation and 25 participating in only traditional hospital-based clinical experiences.

Student participation in the study involves completing the course specific simulation OR hospital-based clinical experiences and one evaluative simulation which will be recorded. Programs in which students participate in simulation OR hospital-based clinical (but not both) and programs that use ONLY clinical or ONLY simulation may be appropriate for the study. If you think your program is eligible, please contact me to discuss the research.

As you may know, the National Council of State Boards of Nursing is conducting research related to clinical judgment and the amount of simulation in which nursing students participate. I am excited to complement this research related to clinical judgment in specialty areas, where clinical experiences are more difficult to secure.

Funds from a small grant are available to help compensate faculty and students for their time. In addition, co-authorship on manuscripts arising from this work may be available, as appropriate. I am excited to discuss the study and logistics of implementation with you or your faculty. I look forward to working with nursing faculty to complete this study and publish the results to provide evidence for our current and future clinical education practices.

Sincerely,



Carol Reid, PhD(c), RN
PhD Student – Nursing; University of North Dakota
carol.reid@my.und.edu
612-718-2969

APPENDIX B

UNIVERSITY OF  NORTH DAKOTA

INSTITUTIONAL REVIEW BOARD
c/o RESEARCH DEVELOPMENT AND COMPLIANCE
DIVISION OF RESEARCH
TWANLEY HALL ROOM 106
264 CENTENNIAL DRIVE STOP 7134
GRAND FORKS ND 58202-7134
(701) 777-4279
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October 3, 2013

Carol Reid

Dear Ms. Reid:

We are pleased to inform you that your project titled, "Clinical Judgment in Beginning Nursing Students: High Fidelity Simulation Versus Traditional Clinical Experiences" (IRB-201310-103), has been reviewed and approved by the University of North Dakota Institutional Review Board (IRB). The expiration date of this approval is October 1, 2014. Your project cannot continue beyond this date without an approved Research Project Review and Progress Report.

As principal investigator for a study involving human participants, you assume certain responsibilities to the University of North Dakota and the UND IRB. Specifically, an unanticipated problem or adverse event occurring in the course of the research project must be reported within 5 days to the IRB Chairperson or the IRB office by submitting an Unanticipated Problem/Adverse Event Form. Any changes to or departures from the Protocol or Consent Forms must receive IRB approval prior to being implemented (except where necessary to eliminate apparent immediate hazards to the subjects or others.)

All Full Board and Expedited proposals must be reviewed at least once a year. Approximately ten months from your initial review date, you will receive a letter stating that approval of your project is about to expire. If a complete Research Project Review and Progress Report is not received as scheduled, your project will be terminated, and you must stop all research procedures, recruitment, enrollment, interventions, data collection, and data analysis. The IRB will not accept future research projects from you until research is current. In order to avoid a discontinuation of IRB approval and possible suspension of your research, the Research Project Review and Progress Report must be returned to the IRB office at least six weeks before the expiration date listed above. If your research, including data analysis, is completed before the expiration date, you must submit a Research Project Termination form to the IRB office so your file can be closed. The required forms are available on the IRB website.

If you have any questions or concerns, please feel free to call me at (701) 777-4279 or e-mail michelle.bowles@research.und.edu.

Sincerely,



Michelle L. Bowles, M.P.A., CIP
IRB Coordinator

MLB/jle

Enclosures

**RESEARCH PROJECT REVIEW AND PROGRESS REPORT
UNIVERSITY OF NORTH DAKOTA INSTITUTIONAL REVIEW BOARD**



DATE July 14, 2015 DEPARTMENT/COLLEGE Nursing
 PRINCIPAL INVESTIGATOR Reid, Carol (Student's Advisor is Jody Ralph)
 PROJECT TITLE Thinking like a nurse: The impact of clinical experiences and high fidelity simulation on clinical judgment
 PROPOSAL NUMBER IRB-201310-103
 IF MEDICAL COMPONENT, PLEASE GIVE PHYSICIAN'S NAME _____

IRB USE ONLY	
<input type="checkbox"/>	FULL BOARD REVIEW REQUIRED, EVEN THOUGH ORIGINAL APPROVAL WAS EXPEDITED
<input checked="" type="checkbox"/>	CONTINUING APPROVAL, EXPEDITED CATEGORY <u>#6</u>
<input checked="" type="checkbox"/>	NEXT REVIEW REQUIRED BEFORE: <u>AUG 26 2015</u>
<input type="checkbox"/>	CONTINUING APPROVAL, BASED ON FULL BOARD REVIEW
<input type="checkbox"/>	NEXT REVIEW REQUIRED BEFORE: _____
<input type="checkbox"/>	SUSPEND APPROVAL, PENDING INVESTIGATION
<input type="checkbox"/>	APPROVAL TERMINATED
COMMENTS OF REVIEWER: _____	
Chair/Vice Chair/Member, IRB: <u>[Signature]</u>	
cc: Jody Ralph, PhD, RN	Approval Date: <u>08-27-15</u>

- Is project complete? Yes No
- Is project ongoing? Yes No
If No, explain below and indicate if continued approval and continuing review is desired.
- How many subjects have been enrolled in the research project:
51 since the date of last approval, and
71 since the initial approval
- Is the research permanently closed to the enrollment of new subjects? Yes No
 Have all subjects completed all research-related interventions? Yes No
 Does the research remain active only for long-term follow-up of subjects? Yes No
- Is data analysis complete? Yes No

*** If the research is permanently closed to the enrollment of new subjects, all subjects have completed all research-related interventions, the research does not need to remain active for long-term follow-up of subjects, and all data analysis is complete, please sign here that you would like the IRB to terminate approval for this project, and finish filling out the rest of this form.

Please terminate IRB approval for this research project. _____
 Signature of Principal Investigator Date

6. Has any additional grant money been awarded for this project in the past year? Yes No
If yes, submit a copy of the grant along with this completed form.

Funding has been granted by Sigma Theta Tau International (STTI) Zeta Chapter. Approval followed UND requirement.

7. Describe any adverse events and/or unanticipated problems involving risks to subjects or others that have occurred since the last approval. If you did not report the adverse event or unanticipated problem previously, a separate Unanticipated Problem/Adverse Event Form must be submitted to RD&C with this form.

No adverse events have been identified since the last approval. Research associates were trained, monitoring mechanisms & established educational procedures were in place, PI maintained frequent contact with research associates.

8. Have any additional risks with this research been identified? Yes No
Describe all benefits experienced by participants, and include a current risk/benefit assessment based on study results.

There is little likelihood of any physical risk as a result of participation in this research project. Participants are not asked to perform tasks beyond traditional educational activities. No invasive procedures are planned for the study. Participants may experience some stress and anxiety during simulations. Support will be provided during debriefing and will be available following the simulation. Careful attention and training of the simulation team will diminish the risk. Recording of the simulations is usual practice. Participants may perceive a risk that participation in the research by allowing recording of the simulation may affect their clinical grade. The risk of this is extremely low.

There are not direct benefits for participants. Data analysis is ongoing. Long term benefits will be determined upon completion of the analysis.

9. Have there been any changes or deviations from the approved protocol since the most recent approval? Yes No If Yes, elaborate below, and submit a separate Protocol Change Form to the RD&C indicating proposed protocol changes.

- a. Have any of these changes been implemented already? Yes No
If yes, please describe fully.

Last protocol change July, 2014

- b. Are any protocol changes being planned for later implementation? Yes No
If yes, please describe fully. A separate Protocol Change Form must be submitted to RD&C for approval before the proposed protocol changes can be implemented.

10. Have any subjects withdrawn from the research? Yes No
If yes, state how many have withdrawn and describe the circumstances.

11. Have there been any complaints about the research since the last IRB review? Yes No
If yes, please report and summarize the complaints and your response/action.

12. Summarize any multi-site trial reports relevant to your research.
N/A

13. Summarize any recent literature, findings, or other information relevant to your research, especially information about risks associated with the research.
No additional literature has been published indicating risks associated with the research.

14. Have all PI's involved with the research completed the IRB Educational Requirements?
Yes No (Educational requirements must be completed before the IRB can grant continued approval for the research project.)

15. On a separate piece of paper, provide a thorough protocol summary (approximately 300 words) giving a concise summary of the protocol's progress to date and the reasons for continuing the study or reasons for asking the IRB to terminate approval. The summary should include, for instance, an explanation of any complaints about the research, relevant multi-site trial reports, participant benefits, or a current risk-benefit assessment based on study results. Sufficient information is required in the summary so that the IRB can determine whether the proposed research continues to fulfill the criteria for approval.

16. A copy of the current informed consent document(s) (with the IRB Approval stamp), as well as a clean copy of the consent document(s) (with no IRB Approval stamp) must be submitted with this report.

17. Have there been any changes in the conflict of interest statement or situation for the Principal Investigators, research staff involved in the study, or each individual's respective family members in the last 12 months?
Yes No If yes, please describe fully on a separate sheet of paper.

Signature of Principal Investigator Carol Reid Date 8/18/15

Current email address: carol.reid@my.und.edu

This completed form should be returned to the IRB, University of North Dakota, 264 Centennial Drive Stop 7134, Grand Forks, ND 58202-7134.

Research Project Review and Progress Report

7/27/07
3

APPENDIX C

Volunteers needed for nursing student clinical judgment study



Clinical judgment is an important skill for nurses to possess. Teaching strategies used to develop this skill are varied. I invite you to be in a research study about clinical judgment in nursing students participating in simulation and traditional clinical experiences in a maternal-newborn clinical course.

The study requires completion of the maternal-newborn clinical course expectations and participation in one additional simulation. The additional simulation will be about one hour in length. Upon completion of the simulation, you will receive a \$10 gift card as a thank you for participating.



To participate: You must be enrolled in the maternal-newborn clinical course. You must be willing to comply with study protocol. Other requirements may apply.

To learn more please call **612-718-2969** or email carol.reid@my.und.edu



APPENDIX D

THE UNIVERSITY OF NORTH DAKOTA CONSENT TO PARTICIPATE IN RESEARCH

TITLE: Thinking like a nurse: The impact of clinical experiences and high fidelity simulation on clinical judgment.

PROJECT DIRECTOR: *Carol Reid*

PHONE # 

DEPARTMENT: *Nursing*

STATEMENT OF RESEARCH

A person who is to participate in the research must give his or her informed consent to such participation. This consent must be based on an understanding of the nature and risks of the research. This document provides information that is important for this understanding. Research projects include only subjects who choose to take part. Please take your time in making your decision as to whether to participate. If you have questions at any time, please ask.

WHAT IS THE PURPOSE OF THIS STUDY?

You are invited to be in a research study about clinical judgment in nursing students participating in simulation and traditional clinical experiences because you are enrolled in a maternal-newborn clinical course.

The purpose of this research study is to determine if, among students in a prelicensure nursing education program, there is a difference in clinical judgment between students who participate in clinically realistic, high-fidelity maternal-newborn simulations and those that participate in traditional maternal-newborn clinical experiences.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 60 students will take part in this study.

HOW LONG WILL I BE IN THIS STUDY?

Your participation in the study will last approximately 6 months. You will need to complete your scheduled maternal newborn clinical course expectations and participate in simulation one additional time. The final simulation experience will take about 1 hour.

WHAT WILL HAPPEN DURING THIS STUDY?

- Following consent to participate, you will complete a survey of demographic information.
- You will complete your clinical rotation (traditional acute care clinical or simulation) as assigned and scheduled by the course faculty.
- If you are in the simulation clinical group, your participation in the last simulation will be audio & video recorded. No additional time in the campus simulation center will be required.
- If you are in the traditional acute care clinical group, following the completion of your clinical rotation, you will participate in one simulation in the campus simulation center, scheduled at a mutually acceptable time. This will take approximately one hour and will be audio & video recorded.
- The researcher will review the audio/video recording and complete the Lasater Clinical Judgment Rubric based on your performance in the recorded simulation.
- The researcher is not an instructor in the course and the score on the Lasater Clinical Judgment Rubric will not be shared with course faculty and will not impact your grade. The researcher will not have access to your course grade.
- The researcher will request your scores in your maternal-newborn didactic (theory) course.

WHAT ARE THE RISKS OF THE STUDY?

There are no foreseeable risks from being in this study

You may experience frustration and embarrassment that is often experienced when participating in simulation. Some simulation and clinical situations may be of a sensitive nature, and you may therefore become upset as a result. However, such risks are not viewed as being in excess of “minimal risk”

If, however, you become upset during participation in the final simulation scenario, you may stop at any time or choose not to continue participating. If you would like to talk to someone about your feelings about this study, you are encouraged to contact [REDACTED]

[REDACTED] 612-659-6700

WHAT ARE THE BENEFITS OF THIS STUDY?

You may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because evidence related to the use of clinically realistic simulations to promote the development of clinical judgment will help prepare nurses to provide safe and effective care to clients in the specialty clinical areas such as maternal-newborn nursing.

ALTERNATIVES TO PARTICIPATING IN THIS STUDY

If you choose not to participate in this study, you will complete your clinical experience as assigned by the course instructor. Participation in this study is not a required component of the course.

WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study.

WILL I BE PAID FOR PARTICIPATING?

You will not be paid for being in this research study. However, a \$10 gift card will be given to each student for participating in all simulation and clinical activities and agree to be audio/video taped during the final simulation.

WHO IS FUNDING THE STUDY?

The research team is not receiving funding from any sources with a vested outcome in the results of the study (i.e. high fidelity simulator company, etc.). Funding will be provided by university-sponsored research time, volunteer hours, and via a grant from Sigma Theta Tau International (STTI) Zeta Chapter.

CONFIDENTIALITY

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record (consent form, rubric score, theory course scores, demographic survey) may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board.

Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of coding audio/video tapes and clinical judgment rubrics which will be stored in a locked cabinet in the researcher's office and/or stored electronically with password protection. Recordings and scored rubrics will be maintained for a minimum of three years, after which they will be destroyed. Faculty teaching the course will not have access to the scored clinical judgment rubric and the score will not impact your clinical course grade.

If we write a report or article about this study, we will describe the study results in a summarized manner (e.g. group data) so that you cannot be identified.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect

your current or future relations with [REDACTED] or the University of North Dakota. The faculty teaching the course will not have access to the scored clinical judgment rubric and the score will not impact your course grade.

If you decide to leave the study early, we ask that you call the researcher. If you withdraw from the course, you will also be withdrawn from the study.

The researcher conducting this study is Carol Reid. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact Carol Reid at 612-718-2969 during the day and after hours or Jody Ralph, Ph.D. (advisor) at 701-777-5784 during business hours.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at **(701) 777-4279**.

- You may also call this number about any problems, complaints, or concerns you have about this research study.
- You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team.
- General information about being a research subject can be found by clicking “Information for Research Participants” on the web site: <http://und.edu/research/resources/human-subjects/research-participants.cfm>

I give consent to be audiotaped during this study.

Please initial: **Yes** **No**

I give consent to be videotaped during this study.

Please initial: **Yes** **No**

I give consent to be photographed during this study.

Please initial: **Yes** **No**

I give consent for my de-identified scores in my maternal newborn nursing didactic (theory) course to be released to the researcher.

Please initial: **Yes** **No**

I give consent to be contacted in the future if further information is needed.

Please initial: **Yes** **No**

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subject Name: _____

Signature of Subject

Date

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative.

Signature of Person Who Obtained Consent

Date

Please complete the bottom half of this form with your name and the code you create.

Tear at the dotted line and submit both halves to the faculty collecting the consent.

+++++

Please copy the CODE created on the demographic survey here

_____/_____/_____/_____/_____

NAME _____

APPENDIX E

Thinking Like a Nurse: The Impact of Clinical Experiences and High Fidelity Simulation on Clinical Judgment

Demographic Survey

Dear Participant,

Thank you for taking time to participate in the study of nursing students' clinical judgment. I ask that you please answer the following questions. Your answers will be kept confidential. As a means of maintaining confidentiality and privacy, I ask that you create a code for yourself. Complete the next six statements to make up your own code: First letter of my father's given name / first letter of my mother's given name / first letter of the month of my birth / first letter of the name of my birthplace / first letter of my middle name

For example, if your father's name is David, your mother's name is Deborah, you were born in February, in Minneapolis, your middle name is Joseph, your code will be:
D/D/F/M/J

This code lets us match your answers and protects your privacy.

The first letter of my father's given name is _____

The first letter of my mother's given name is _____

The first letter of the month of my birth is _____

The first letter of the name of my birthplace is _____

The first letter of my middle name is _____

Enter CODE here: _____

Please answer the following questions by circling the appropriate response.

1. What is your age?

18-24 years old

25-34 years old

35-44 years old

Over 44 years

2. What is your gender?

Male

Female

3. Race/ethnicity: How do you describe yourself? (please circle the **one** option that best describes you)
 - American Indian or Alaska Native
 - Hawaiian or Other Pacific Islander
 - Asian or Asian American
 - Black or African American
 - Hispanic or Latino
 - Non-Hispanic White

4. Education: What is the highest degree you have received? *If currently enrolled, highest degree completed:*
 - High school graduate, diploma or the equivalent (for example: GED)
 - Trade/technical/vocational certificate/training
 - 2 year/Associate's degree
 - 4 year/Bachelor's degree
 - Master's degree
 - Other (specify)

5. Employment status: Are you currently:
 - Employed for wages
 - Self-employed
 - Out of work and looking for work
 - Out of work but not currently looking for work
 - Military
 - Retired
 - Unable to work

6. Have you had experience with pregnancy or childbirth?
 - Yes
 - No

7. If yes, please briefly describe your experience:

APPENDIX F

LASATER CLINICAL JUDGMENT RUBRIC

Noticing

Effective NOTICING involves:	Exemplary	Accomplished	Developing	Beginning
Focused Observation	Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information	Regularly observes/monitors a variety of data, including both subjective and objective; most useful information is noticed, may miss the most subtle signs	Attempts to monitor a variety of subjective and objective data, but is overwhelmed by the array of data; focuses on the most obvious data, missing some important information	Confused by the clinical situation and the amount/type of data; observation is not organized and important data is missed, and/or assessment errors are made
Recognizing Deviations from Expected Patterns	Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment	Recognizes most obvious patterns and deviations in data and uses these to continually assess	Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment	Focuses on one thing at a time and misses most patterns/deviations from expectations; misses opportunities to refine the assessment
Information Seeking	Assertively seeks information to plan intervention: carefully collects useful subjective data from observing the client and from interacting with the client and family	Actively seeks subjective information about the client's situation from the client and family to support planning interventions; occasionally does not pursue important leads	Makes limited efforts to seek additional information from the client/family; often seems not to know what information to seek and/or pursues unrelated information	Is ineffective in seeking information; relies mostly on objective data; has difficulty interacting with the client and family and fails to collect important subjective data

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LASATER CLINICAL JUDGMENT RUBRIC

Interpreting

Effective INTERPRETING involves:	Exemplary	Accomplished	Developing	Beginning
Prioritizing Data	Focuses on the most relevant and important data useful for explaining the client's condition	Generally focuses on the most important data and seeks further relevant information, but also may try to attend to less pertinent data	Makes an effort to prioritize data and focus on the most important, but also attends to less relevant/useful data	Has difficulty focusing and appears not to know which data are most important to the diagnosis; attempts to attend to all available data
Making Sense of Data	Even when facing complex, conflicting or confusing data, is able to (1) note and make sense of patterns in the client's data, (2) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (3) develop plans for interventions that can be justified in terms of their likelihood of success	In most situations, interprets the client's data patterns and compares with known patterns to develop an intervention plan and accompanying rationale; the exceptions are rare or complicated cases where it is appropriate to seek the guidance of a specialist or more experienced nurse	In simple or common/familiar situations, is able to compare the client's data patterns with those known and to develop/explain intervention plans; has difficulty, however, with even moderately difficult data/situations that are within the expectations for students, inappropriately requires advice or assistance	Even in simple of familiar/common situations has difficulty interpreting or making sense of data; has trouble distinguishing among competing explanations and appropriate interventions, requiring assistance both in diagnosing the problem and in developing an intervention

LASATER CLINICAL JUDGMENT RUBRIC

Responding

Effective RESPONDING involves:	Exemplary	Accomplished	Developing	Beginning
Calm, Confident Manner	Assumes responsibility: delegates team assignments, assess the client and reassures them and their families	Generally displays leadership and confidence, and is able to control/calm most situations; may show stress in particularly difficult or complex situations	Is tentative in the leader's role; reassures clients/families in routine and relatively simple situations, but becomes stressed and disorganized easily	Except in simple and routine situations, is stressed and disorganized, lacks control, making clients and families anxious/less able to cooperate
Clear Communication	Communicates effectively; explains interventions; calms/reassures clients and families; directs and involves team members, explaining and giving directions; checks for understanding	Generally communicates well; explains carefully to clients, gives clear directions to team; could be more effective in establishing rapport	Shows some communication ability (e.g., giving directions); communication with clients/families/team members is only partly successful; displays caring but not competence	Has difficulty communicating; explanations are confusing, directions are unclear or contradictory, and clients/families are made confused/anxious, not reassured
Well-planned Intervention/Flexibility	Interventions are tailored for the individual client; monitors client progress closely and is able to adjust treatment as indicated by the client response	Develops interventions based on relevant patient data; monitors progress regularly but does not expect to have to change treatments	Develops interventions based on the most obvious data; monitors progress, but is unable to make adjustments based on the patient response	Focuses on developing a single intervention addressing a likely solution, but it may be vague, confusing, and/or incomplete; some monitoring may occur
Being Skillful	Shows mastery of necessary nursing skills	Displays proficiency in the use of most nursing skills; could improve speed or accuracy	Is hesitant or ineffective in utilizing nursing skills	Is unable to select and/or perform the nursing skills

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LASATER CLINICAL JUDGMENT RUBRIC

Reflecting

Effective REFLECTING involves:	Exemplary	Accomplished	Developing	Beginning
Evaluation/Self-Analysis	Independently evaluates/analyzes personal clinical performance, noting decision points, elaborating alternatives and accurately evaluating choices against alternatives	Evaluates/analyzes personal clinical performance with minimal prompting, primarily major events/decisions; key decision points are identified and alternatives are considered	Even when prompted, briefly verbalizes the most obvious evaluations; has difficulty imagining alternative choices; is self-protective in evaluating personal choices	Even prompted evaluations are brief, cursory, and not used to improve performance; justifies personal decisions/choices without evaluating them
Commitment to Improvement	Demonstrates commitment to ongoing improvement: reflects on and critically evaluates nursing experiences; accurately identifies strengths/weaknesses and develops specific plans to eliminate weaknesses	Demonstrates a desire to improve nursing performance: reflects on and evaluates experiences; identifies strengths/weaknesses; could be more systematic in evaluating weaknesses	Demonstrates awareness of the need for ongoing improvement and makes some effort to learn from experience and improve performance but tends to state the obvious, and needs external evaluation	Appears uninterested in improving performance or unable to do so; rarely reflects; is uncritical of him/herself, or overly critical (given level of development); is unable to see flaws or need for improvement

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APPENDIX G

Stephanie Sideras, RN, PhD

OREGON HEALTH & SCIENCE UNIVERSITY
SCHOOL OF NURSING

Ashland Campus
1250 Siskiyou Blvd
Ashland, Oregon 97520
541-552-6249
siderast@ohsu.edu

EDUCATION

2008	Doctor of Philosophy, Oregon Health & Science University Portland, Oregon Major: Nursing Education
1990	Master's of Science in Nursing, St. Louis University St. Louis, Missouri Major: CardioPulmonary Clinical Nurse Specialist
1985	Bachelor of Science, St. Louis University St. Louis, Missouri Major: Nursing
1983	Bachelor of Science, Willamette University Salem, Oregon Major: Psychology & Political Science

PROFESSIONAL POSITIONS

09/2008 - present	Assistant Professor, Oregon Health & Science University Ashland, Oregon
09/1999 – 09/2008	Clinical Instructor, Oregon Health & Science University Ashland, Oregon
09/2004 – 09/2006	Joint Faculty position, Rogue Valley Memorial Hospital with Oregon Health & Science University Ashland, Oregon
07/2000 – 08/2006	Per diem staff nurse PACU, Providence Medford Medical Center Medford, Oregon
09/1998 - -7/1999	Anticoagulation Coordinator, Rockwood Clinic Spokane, Washington
08/1994 – 08/1989	Staff nurse, Rockwood Clinic Ambulatory Surgery Center Spokane, Washington
07/1991 – 05/1993	Visiting Instructor, Gonzaga University Spokane, Washington
01/1991 – 07/1991	Nurse Education Coordinator, St. Louis University Hospital St. Louis, Missouri
07/1989 – 12-1990	Chief Flight Nurse, Air-Med International Webster Groves, Missouri

12/1989 – 07/1991	Coronary Intensive Care staff nurse, St. Louis University Hospital St. Louis, Missouri
11/1988 – 11/1989	Surgical Intensive Care staff nurse, St. Mary's Health Center Richmond Heights, Missouri
03/1987 – 11/1988	Medical Intensive Care staff nurse, Incarnate Word Hospital St. Louis, Missouri
03/1986 – 02/1987	Telemetry Unit staff nurse, Incarnate Word Hospital St. Louis, Missouri
05/1985 – 02/1986	Acute Care staff nurse, Incarnate Word Hospital St. Louis, Missouri

FUNDED RESEARCH

2015-2016	<i>Quantifying the influence of expert modeling on novice nurses' competency and self-efficacy: Part II.</i> Role: Co-Investigator. National League for Nursing, \$20,000.
2012 -2014	<i>The impact of simulation based learning activities on nursing students' knowledge, attitude, behavior and empathy toward patient's with schizophrenia: A multi-site pilot study.</i> Role: Primary Investigator National League for Nursing (funded \$15,000) & Sigma Theta Tau (funded \$950)
2011 – 2012	<i>Evaluation of a Clinical Education Redesign.</i> Dr. Christine Tanner, PI. Role: Simulation design, implementation. Fund for the Improvement of Post-Secondary Education.
2010-2011	<i>Redesigning clinical learning through simulation and practice Clinical judgment in action.</i> Role: Co-Primary Investigator. National League for Nursing. Funded \$15,000
2007-2008	<i>Dissertation: Evaluation of the construct validity of the Lasater Clinical Judgment Rubric.</i> Dissertation Chair: Dr. Christine Tanner. Role: Primary Investigator. Received \$5,000

RESEARCH GRANTS SUBMITTED, NOT FUNDED

2012	<i>Facilitating development of teacher expertise in clinical questioning.</i> Role: Primary investigator. Submitted to National Academy of Education. Not funded
2012	<i>Use of live actor cuing to promote observational learning in simulation.</i> Role: Primary investigator. Submitted to Robert Wood Johnson Foundation. Not funded
2011	<i>Evaluating the reliability and validity of a clinical competence rating scale in simulation.</i> Role: Primary Investigator. Submitted to Robert Wood Johnson Foundation. Not funded
2010	<i>Student performance anxiety: A comparison across settings.</i> Role: Primary investigator. Submitted to American Nurses Foundation. Not funded
2010	<i>An examination of the construct validity of a performance appraisal instrument for use in simulation.</i> Role: Primary Investigator. Submitted to Oregon Health & Science University. Not funded
2009	<i>Evaluating Innovations in Nursing Education: A comparison of simulation implementation characteristics and effectiveness.</i> Role: Co-Primary Investigator. Submitted to Robert Wood Johnson Foundation. Not funded

UNFUNDED RESEARCH

- 2013 *The impact of handoff practice in simulation on quality and safety competencies.*
Role: Primary Investigator.
- 2012 *Reliability testing of a performance appraisal instrument used in simulation.* Role:
Primary Investigator.
- 2011 *The influence of a poverty simulation on nursing student attitudes toward poverty.*
Primary Investigator: Joanne Noone. Role: Consultant and simulation
implementation.

PUBLICATIONS

Submitted for Publication

Calhoun, A., Cendan, J., Dong, C., Kipper, K., **Sideras, S.**, Smitten, J., Auerbach, M., Yznaga, E., Kurrek, M., & Hui, J. (submitted for publication, 2015). Empowering the inexperienced: surmounting barriers to research engagement. Submitted to *Clinical Simulation in Nursing*

Refereed Journal Articles

- Franklin, A.E., Gubrud-Howe, P., **Sideras, S.**, & Lee, C. (2015). Effectiveness of simulation preparation on novice nurses' competence and self-efficacy in a multiple patient simulation. *Nursing Education Perspectives, 36*(5), 324-325.
- Sideras, S.**, McKenzie, G., Noone, J., Dieckmann, N. & Allen, T. (2015). Impact of a simulation on nursing students' attitudes towards schizophrenia. *Clinical Simulation in Nursing, 11* (2) 134-141. DOI: 10.1016/j.ecns.2014.11.005
- Franklin, A.E., **Sideras, S.**, Gubrud-Howe, P., & Lee, C. (2014). Comparison of expert modeling versus voice over powerpoint lecture and presimulation readings on novice nurses' competence of providing care to multiple patients. *Journal of Nursing Education, 53*(11), 615-622
- Sideras, S.**, McKenzie, G., Noone, J., Markle, D., Frazier, M. & Sullivan, M. (2013). Making simulation come alive: Standardized patients in undergraduate education. *Nursing Education Perspectives, 34*(6), 421-425
- Decker, S., Fey, M., **Sideras, S.**, Rockstraw, L. Caballero, S., Franklin, A.E., Gloe, D., Lioce, L., Sando, C.R., Meakim, C., & Borum J. (2013). Standards of best practice: Simulation. Standard VI: The debriefing process. *Clinical Simulation in Nursing, 9*(6S), S26-S29
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- Ross, A.M., Noone, J., Luce, L.L. & **Sideras, S.**, (2009). Spiraling evidence-based practice and outcomes management concepts in an undergraduate curriculum: A systematic approach. *Journal of Nursing Education, 48*(6), 319-326.

NonRefereed Journal Articles

Sideras, S., & Benner, P. (2014, Oct). simulation Pre-Briefing: Creating safe disclosive spaces for high impact learning. *Educating Nurses*. Retrieved June 12, 2015 from <http://www.educatingnurses.com>.

Refereed Chapters

Noone, J., Bromley, T., McKenzie, G., Naumes, S., **Sideras, S.**, & Voss, H. (2013). Implementing cultural learning activities through community and academic partnerships. In L. Caputi (Ed.) *Innovations in nursing education: Building the future of nursing* (pp.61-73). Philadelphia: Lippincott, Williams, & Wilkins.

INVITED PRESENTATIONS

Sideras, S. (2104) Teaching the Novice Student Relational & Communication Skills of Engagement Part I and II: The Art and Science of Designing Simulations. Interview for video module for Patricia Benner's *Educating Nurses* website

Sideras, S. (2014). Teaching the Novice Student Relational & Communication Skills of Engagement Part III: Pre-Briefing & Live Actor Simulation with 1st Year Students. Video module for Patricia Benner's *Educating Nurses* website

Sideras, S. (2013) Integration of Simulation into a Nursing Curriculum. Invited presentation for the National League for Nursing. Webinar

Sideras, S., & Kohan, P. (2013). *Teaching QSEN Competencies Using Simulation*. Invited presentation at Oregon Consortium for Nursing Education conference. Eugene, OR

Sideras, S., Gubrud-Howe, P. (2011) *Introducing the OSCCRs – Evaluating Clinical Judgment in Nursing Students*. Invited workshop at the International Association for Simulation and Clinical Nursing. Orlando, Florida.

Sideras, S., & Taylor, J. (2011). *Two Methods for Evaluation of Clinical Seasoning in simulation*. Invited presentation at the Northwest Nursing Education Institute. Portland, OR

Gubrud-Howe, P. & **Sideras, S.** (2011). *Assessment in Simulation: Using the OSCCRs*. Invited presentation at the Oregon Simulation Alliance. Portland, Oregon

Sideras, S., & Frazier, M., (2011). *Developing Standardized Patient Simulations*. Invited presentation at Oregon Simulation Alliance. Portland, OR

Sideras, S., & Noone, J. (2011). *Designing Simulations for Standardized Patients: Part I*. Invited presentation at the Oregon Nursing Education Consortium. Eugene, OR

McKenzie, G., & **Sideras, S.** (2011). *Using standardized Patients I Mental Health Simulations: Part II*. Invited presentation Oregon Consortium for Nursing Education. Eugene, OR

PRESENTATIONS AT REGIONAL, NATIONAL & INTERNATIONAL CONFERENCES

International

Gubrud-Howe, P., & **Sideras, S.** (2014). *Designing Simulations for Clinical Judgment: A Comprehensive Approach*. Paper presented at the Australian SimHealth conference, Adelaide, Australia.

Hsiung, R., & **Sideras, S.** (2013). *Cognitive Aids in Simulation*. Paper presented at the Asia Pacific Meeting for Simulation Healthcare. Shanghai, China.

Kardong-Edgren, S., Lampotang, S., Anderson, M., LeFlore, J., & **Sideras, S.** (2013). *Problems in Conducting Simulation Based Research*. Paper presented at the Asia Pacific Meeting for Simulation Healthcare. Shanghai, China.

LeFlore, J., **Sideras, S.**, Lampotang, S., & Liaw, S.Y. (2013). *Developing a Research Question*. Paper presented at the Asia Pacific Meeting for Simulation Healthcare. Shanghai, China

National

- Fey, M., Ng, G., Gardner, R., Palanganas, J., Morse, K., & **Sideras, S.** (2014). *Getting the Most out of Debriefing – Use Good Judgment*. Workshop presented at the International Nursing Association for Simulation and Clinical Learning. Orlando, Florida
- Sideras, S.**, & Kohan, P. (2014). *The Impact of Handoff Practice in Simulation on Quality and Safety Competencies*. Paper presented at the QSEN Education conference. Baltimore, Maryland.
- McKenzie, G., **Sideras, S.**, Noone, J., & Allen, T (2014). *The Impact of Simulation on Nursing Students' Attitudes Toward Patients with Schizophrenia*. Poster presented at the Western Institute of Nursing, Seattle, Washington
- Lasater, K., Nielsen, A., **Sideras, S.**, & VanderSluis, R. (2013). Teaching for Clinical Judgment. Panel presentation for ATI National Nurse Educators Summit, Las Vegas, NV
- Sideras, S.**, & Kohan, P. (2013). *Using Simulation to Teach QSEN Competencies*. Paper presented at the International Association for Simulations and Clinical Learning. Las Vegas, Nevada
- McKenzie, G., **Sideras, S.**, Noone, J. (2012). *Creating Situated Learning Opportunities Using Live Actor Simulation*. Paper presented at the National League for Nursing Education Summit. Anaheim, CA
- Sideras, S.**, (2012). *Developing Anticipated Concerns & Initial Priorities: A Teaching Strategy for Clinical Reasoning Development*. Paper presented at the International Meeting for Simulation in Healthcare. San Diego, CA
- Bloom, C., & **Sideras, S.** (2012). *It Does Not Take a Laxative to Get a Simulation Moving! Rx: Mind Maps and Emotional Intelligence*. Workshop presented at the International Meeting for Simulation in Healthcare. San Diego, CA
- Lasater, K., **Sideras, S.**, & Johnson, B. (2011). *Striving for Fusion: A Digital Toolkit to Manage a Multi-Site Simulation Study*. Paper presented at the International Meeting for Simulation in Healthcare. New Orleans, LA
- Sideras, S.**, & Gubrud-Howe, P. (2011). *Introducing the OSCCRs! Evaluating Clinical Judgment in Nursing Student*. Paper presented at the International Meeting for Simulation in Healthcare. New Orleans, LA

Regional

- Sideras, S.**, McKenzie, G., & Noone, J. (2011). Use of Standardized Patients in an Undergraduate Curriculum. Poster presented at the Western Institute of Nursing. Las Vegas, NV
- McKenzie, G., **Sideras, S.**, & Noone, J. (2011). *Trajectories of Mental Health Disorders: Use of Standardized Patients*. Poster presented to Western Institute of Nursing, Las Vegas, NV
- Noone, J., **Sideras, S.**, & McKenzie, G. (2011). *Using Adolescent Standardized Patients in a Health Promotion Course*. Poster presented at the Western Institute of Nursing. Las Vegas, NV

PROFESSIONAL MEMBERSHIPS & SERVICE ACTIVITIES

2010 to present	Southern Oregon University. Guest simulation event for 40 pre-nursing freshman students
2012 to present	Oregon Health & Science University: Faculty Affairs Committee. Member
2012	Oregon State University. Simulation event dedicated to rural middle school students to encourage pursuit of a health career
2011 to 2013	Southern Oregon University sponsored: CampMD 3 day event for middle school students using mentoring, simulation, and skills lab learning activities to encourage pursuit of a health career
2010 to present	Western Institute of Nursing
2009 to present	Association of Standardized Patients
2009 to 2011	Grants Pass High School Health Careers Pathway student event

2009 to 2011	3 day simulation event engaging high school students in thinking like a nurse to encourage college recruitment Southern Oregon University sponsored: Hands on Healthcare. Week long simulation and skills lab learning activities to encourage a healthcare career
2009	Phoenix Middle School simulation event and lab tour 1 day event designed to expose middle school students to the excitement of a career in nursing
2008 to present	Oregon Health & Science University: Ashland campus Curriculum Committee. Member Chair from 2009-2011
2008 to present	Southern Oregon University sponsored: Academia Latina 4 days of skills lab and simulation events to encourage young Latinas to pursue college careers in healthcare
2007 to present	Society for Simulation in Healthcare. Member Research Committee 2012-present
2007 to present	International Nursing Association for Simulation and Clinical Learning Debriefing Standards Committee 2012-2013
2006 to present	Advancement of Women in Science, Engineering and Math. Annual simulation engaging middle school aged girls in the life of a working nurse to encourage college recruitment
2006 to present	Oregon Consortium for Nursing Education. Research and Evaluation Committee. Co-Chair 2011 to present
2005 to present	National League for Nursing
1996-2005	Northwest Post Anesthesia Nurses' Association Vice-President, Spokane district 1997-1999
1985 to present	Sigma Theta Tau International, Beta Psi Chapter. Member 2 nd Vice-President, Ashland campus 1999-2010

SCHOLARLY REVIEW ACTIVITIES

2012 to present	Nursing Education Perspectives, Reviewer
2011 to present	Clinical Simulation in Nursing, Reviewer
2011 to present	Western Institute of Nursing, Abstract Reviewer

AWARDS RECEIVED

2013	Finalist, Oregon Health & Science University School of Nursing annual award in the category of service to the university
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STUDENT & FACULTY MENTORSHIP

Graduate Student Mentoring

<i>Student</i>	<i>Mentorship Role</i>	<i>Dissertation Title</i>
Ashley Franklin, completed, 2014	Dissertation Committee member	Quantifying the influence of expert role modeling on novice nurses competence and self-efficacy

Formal Faculty Mentoring

<i>Faculty</i>	<i>Mentorship Role</i>	<i>Area of Mentorship</i>
Stella Heyworth, 2011	Mentor	Teaching at Oregon Health & Science University
Donna Dial, 2014	Practicum preceptor	Simulation education for Georgetown University

Patricia Kohan, 2012	Practicum preceptor	Simulation education for Walden College then a Research practicum
Carol Reid, 2012	Practicum preceptor	Research practicum in simulation education for University of North Dakota
Mary Fey, 2012	Practicum preceptor	Research practicum in simulation education for University of Maryland
Voss, Fran, 2011	Practicum preceptor	Simulation education for Oregon Health & Science University, RN/BS program
Cheryl Palmer, 2010	Practicum preceptor	Simulation education for the Oregon Simulation Alliance
Ron Meecham, 2009	Practicum preceptor	Simulation education for University of Worcester, United Kingdom

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