HIGH-FIDELITY NURSING SIMULATION: IMPACT ON STUDENT SELF-CONFIDENCE AND CLINICAL COMPETENCE

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ABSTRACT

RESEARCH TOPIC:  High-Fidelity Nursing Simulation: Impact on Student Self-Confidence and Clinical Competence

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High-fidelity simulation has been recommended as a teaching-learning strategy to increase students’ self-confidence and clinical competence. The purpose of this study is to examine differences in the self-confidence of four groups of students, two in the traditional clinical lab, and two in the enhanced clinical simulation lab, and faculty ratings of the clinical competence of students in a medical-surgical nursing course from midterm to final. This study is a partial replication of Blum, Borglund, and Parcells’ (2010) study. The Tanner (2006) Clinical Judgment Model and the Lasater (2007) Clinical Judgment Rubric provide the framework for this study. The student sample will be 60 Junior Bachelor of Science nursing students at a large, public University in the mid-western United States. The instrument to measure student self-confidence and clinical competence will be the Lasater (2007) Clinical Judgment Rubric. The findings will provide information regarding the use of high-fidelity simulation in nursing education.
Chapter I

Introduction

According to the Institute of Medicine (IOM, 2010), health care in the United States (U.S.) has become non-sustainable; therefore changes are needed to provide accessible, safe, and high-quality care. To address this problem, the U.S. Congress signed a bill into law to address the unequal distribution of health care costs. The comprehensive health care legislation is referred to as the Affordable Care Act (ACA). The ACA will transform healthcare by requiring many changes within the health care system. The U.S. Department of Health and Human Services (2012) estimated that 30 million uninsured Americans will receive access to health care under the ACA (Buettgens, Garret, & Holahan, 2010). The increase in the number of Americans with health insurance coverage will demand an increase in the number of professional registered nurses providing expert care (IOM, 2010).

Another challenge facing the healthcare system is the aging population. According to the Administration on Aging (AOA), the number of people over the age of 65 was reported as 39.6 million in 2009 (AOA, 2011). With the coming of age (65) of the baby-boomers, by 2030 there will be 72.1 million people over the age of 65 (AOA, 2011).
The doubling of the population of persons over the age of 65, in addition to the dramatic increase in chronic and complex health conditions, such as heart failure and diabetes (Centers for Disease Control, 2013), requires health care professions to respond with skilled clinicians capable of meeting the increased demands. The nursing profession will be impacted by the changes as the demand for high-quality, highly skilled, and technologically advanced healthcare increases within the reformed system (American Nurses Association, 2012).

The increasing need for expert nursing care, and increasing number of older people who need care, calls for additional health care professionals, especially registered nurses (RNs). Data consistently report a shortage of nurses both now and in the future. Current projections as reported by the American Association of Colleges of Nursing (AACN) indicate a shortage of 260,000 RNs by 2025 (AACN, 2012) because there is a rapidly aging nursing population. Nearly 900,000 of the 2.6 million working RNs are over the age of 50. In addition, there is an increase in the demand for nurses due to the aging baby-boomer population, an increase in the number of insured individuals, and advancing health care technology (AACN, 2010). Projections reported in 2012 by the Bureau of Labor Statistics (BLS) included 1.2 million job openings for registered nurses (RN) by 2020. Therefore there is a call to increase the RN workforce to meet the long-term needs of the health care system (AACN, 2010). The nursing shortage presents a challenge to both practice areas and schools of nursing.

In 2003, the IOM addressed the competencies needed in the future for professional practice. The competencies include: delivering patient-centered care,
working as part of interdisciplinary teams, practicing evidence-based medicine, focusing on quality improvement, and using information technology (Greiner & Knebel, 2003). Within the hospital setting, nurses must make “…critical decisions associated with care for sicker, frailer patients, and work with sophisticated, life-saving technology” (IOM, 2010, p. S-5). Nurses need to have high level critical thinking and clinical-decision-making skills. Hospitals are looking to schools of nursing to prepare competent practitioners. Nursing education is targeted to prepare skilled professional RNs to meet the increased health care demands of the aging population, and the increased level of acuity in patient care (IOM, 2010).

According to the Institute of Medicine’s (2010) Future of Nursing Report, nursing education must keep pace with healthcare changes to prepare nurses to deliver safe, high-quality health care in the changing health care environment. Current nursing curricula have included increased technology and simulation labs to teach, validate and evaluate nursing skills (Bambini, Washburn & Perkins, 2009; Blum, Borglund & Parcells, 2010; Lasater, 2007; Sullivan-Mann, Perron & Fellner, 2009). Nursing education must continue to create and evaluate teaching-learning strategies to teach nursing concepts that can be applied to many different situations (IOM, 2010). One teaching method under investigation is high-fidelity simulation (HFS). The literature supports the use of HFS in nursing to develop advanced skills (Bambini et al., 2009). Further research is needed to evaluate the effectiveness of HFS as a method of teaching critical thinking in nursing (Blum et al., 2010; Gaberson & Oermann, 2010; Jeffries, 2005; Lasater, 2007; Wellman, 2009).
Background and Significance

Critical thinking and clinical reasoning are essential to the practice of nursing. There is no one, singular definition of critical thinking (Tanner, 2006; Wellman, 2009). The American Philosophical Association (APA) (Facione, 1990), using the Delphi method, came to the following consensus statement regarding critical thinking: “We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which judgment is based” (Facione, 1990, p. 2). This is referred to as the Delphi Report.

Scheffer and Rubenfeld (2000) also conducted a Delphi study that included expert nurses from nine countries. The purpose of the study was to define critical thinking in nursing, as well as to identify and define habits and skills of critical thinking in nursing. The panel’s definition of critical thinking is as follows:

Critical thinking in nursing is an essential component of professional accountability and quality nursing care. Critical thinkers in nursing exhibit these habits of the mind: confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance and reflection. Critical thinkers in nursing practice the cognitive skills of analyzing, applying standards,
discriminating, information seeking, logical reasoning, predicting and transforming knowledge. (Scheffer & Rubenfeld, 2000, p. 357)

Researchers often use the terms critical thinking, clinical judgment, problem solving and decision making interchangeably (Tanner, 2006; Wellman, 2009). Each, however, has a distinct definition.

**Critical Thinking.**

Critical thinking (CT) has been defined by many authors throughout the years. To date, a consensus definition has not been agreed on (Tanner, 2006). Facione (1990) defined critical thinking as “… purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which judgment is based” (p. 2). Scheffer and Rubenfeld (2000) defined CT as an essential component of nursing practice in which similar habits of mind and cognitive analysis skills are applied. Kennison (2006) defined CT based on the definition of the American Philosophical Association Delphi study: interpretation, analysis, inference, evaluation, explanation, and self-evaluation (Facione, 1990, as cited in Kennison). Gaberson and Oermann (2010, p. 215) stated that critical thinking allows a nurse to make “…reasoned and informed judgments in the practice setting and decide what to do in a given situation.” Tanner’s (2006) Clinical Judgment Model proposes that critical thinking emerges based on self-confidence and clinical competency.
Critical thinking in nursing education needs to be evaluated to determine the effectiveness of the teaching method. The tools used include the Watson-Glaser Critical Thinking Appraisal (WGCTA), the California Critical Thinking Disposition Inventory (CCTDI), and the California Critical Thinking Skills Test (CCTST). The Watson-Glaser Critical Thinking Appraisal (WGCTA) was developed from one of the earliest definitions of critical thinking by Watson and Glaser (1964). Watson and Glaser defined critical thinking as a combination of attitudes, knowledge and skills (as cited in Wellman, 2009). The WGCTA has five subscales designed to measure the concepts of critical thinking. The WGCTA has been utilized in several studies related to nursing students and critical thinking (Adams, Stover & Whitlow 1999; Bauwens & Gerhard, 1987; Magnussen, Ishida & Itano, 2000).

The California Critical Thinking Skills Test (CCTST) was the first instrument to use the American Philosophical Association’s (Facione, 1990) definition of critical thinking (Wellman, 2009). The CCTST has been utilized in several studies related to nursing and critical thinking (Bowles, 2000; Kennison, 2006; Thompson & Rebeschi, 2000). The CCTST is a standardized multiple choice test. The purpose of the CCTST is to test core critical thinking skills considered to be necessary for college students (Wellman, 2009). The California Critical Thinking Disposition Inventory (CCTDI) also uses the American Philosophical Association’s definition of critical thinking (as cited in Wellman, 2009).
Clinical Judgment.

Tanner (2006) defined clinical judgment as “an interpretation or conclusion about a patient’s needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient’s response” (Tanner, 2006, p. 204). Blum et al. (2010) defined clinical judgment based on Tanner’s (2006) Clinical Judgment Model, which emphasizes: noticing, interpreting, responding, and reflecting (Blum et al., 2010).

Clinical Reasoning.

Clinical reasoning was defined as:

…..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 (e.g. recognition of a pattern, an intuitive clinical grasp, a response without evident forethought).

(Tanner, 2006. pp. 204-205).

Clinical Confidence.

Roach (2002) defined confidence in nursing as a caring attribute fostering mutual trust and respect in the nurse-patient relationship. Traditionally, nursing faculty have observed nursing students’ interactions with nurses, patients, families, and other health care staff. This technique does not capture students’ own perceptions of self-confidence. Nursing students report an increase in self-confidence as a progression through several
stages “… feeling, knowing, doing, and reflecting” (Crooks et al., 2005, p. 360). In addition to practicing clinical skills to gain self-confidence with nursing assessment and skill development, research supports the use of self-reflection (Lasater & Nielsen, 2009).

Student Clinical Competence.

Nurse competence requires the application of knowledge and skills in responding appropriately to the complex patient-care environment (Roach, 2002). The increasing complexity of the health care environment requires early introduction to prioritization and critical thinking. The past techniques of faculty observation lack objectivity and structure (Lasater, 2007). Lee-Hsieh, Kao, Kuo, and Tseng (2003) have identified expert faculty ratings, compared to students’ assessment of their competence, as more reflective of integration of theory, nursing skills and interpersonal skills.

Teaching Critical Thinking.

Simulations are an established way to teach critical thinking (Bambini et al., 2009; Jeffries & Rizzolo, 2006; Lasater, 2007). Simulations are “…activities that mimic reality of a clinical environment and are designed to demonstrate procedures, decision-making and critical thinking through techniques such as role-playing and the use of devices such as interactive videos or mannequins” (Jeffries, 2005, p. 97). Due to low safety risks, simulation has been used in pilot preparation, military special force teams, and medical students preparing to administer anesthesia or perform surgery (Jeffries, Clochesy, & Hovancsek, 2009). Low-fidelity simulation, such as the use of mannequins and role-play, has been used in nursing education for the last four decades. The
introduction of high-fidelity simulators in the late 1990s has transformed the use of simulation in nursing education (Jeffries et al., 2009).

Clinical simulation in nursing allows educators to promote critical thinking in a safe, risk-free environment (Gaberson & Oermann, 2010). Gaberson and Oermann described the three types of simulation used in nursing education. Low-fidelity simulation (LFS) has been utilized in nursing education for many years. LFS is a less precise reproduction of a real-life psycho-motor skill, such as using a mannequin or pelvis model for catheter insertion or a mannequin arm for intravenous catheter insertion. Moderate-fidelity simulation (MFS) provides some feedback to users. The MFS mannequins can produce heart and lung sounds.

High-fidelity simulators (HFS), or human patient simulators (HPS), are the most recent technology used in simulation beginning in the late 1990s. High-fidelity simulators are the most realistic type of simulators which can be programmed to react to student and pharmacologic interventions (Gaberson & Oermann, 2010). HPS allows the student to assess a health situation using both physiologic measures and communication with the patient. The student plans and implements interventions and receives immediate feedback from the simulator.

Another approach to evaluating critical thinking in nursing education is through more qualitative methods. Lasater (2007) established the Lasater Clinical Judgment Rubric (LCJR) based on Tanner’s (2006) Clinical Judgment Model. The LCJR is a tool used by nurse educators to provide a clear guideline for evaluating clinical judgment. The LCJR also promotes student self-reflection by asking students to evaluate
performance based on the rubric. Critical thinking may be seen as a reflective process. Nielsen, Stragnell and Jester (2007) used both Tanner’s model and the LCJR to develop a guided, reflective journaling tool, The Guide for Reflection. Students write about clinical situations and use prompts in the guide to help explore thought processes and decision making (Lasater & Nielsen, 2009).

Blum et al.’s (2010) study examined the clinical judgment skills of nursing students, and identified confidence and clinical competence as central themes reflected on by nursing students after a high-fidelity simulation experience. The purpose of the study was to examine the relationship between student self-confidence and clinical competence. Tanner’s Clinical Judgment Model and Lasater’s Clinical Judgment Rubric provided the theoretical framework for the study. This study will partially replicate the study by Blum et al. (2010) to validate the findings and provide further information about use of the Lasater’s (2007) Clinical Judgment Rubric as a tool to evaluate critical thinking and clinical judgment.

Statement of Problem

Student nurses often lack the opportunity to practice complex clinical skills. Students may lack confidence due to lack of practice, resulting in lower levels of clinical competence. High-fidelity simulation is being used as a teaching method to increase student self-confidence and clinical competence. Further research is needed to test the effectiveness of high-fidelity simulation in increasing self-confidence and clinical competence in nursing students (Blum et al., 2010).
Purpose of the Study

The purpose of this study is to examine differences in the self-confidence of four groups of students, two in the traditional clinical lab, and two in the enhanced clinical simulation lab, and faculty ratings of the clinical competence of the students in a medical-surgical nursing course from midterm to final. This study is a partial replication of Blum et al.’s (2010) study.

Research Questions

1. Are there differences in student self-confidence in four groups of students, two groups in the traditional lab section of the course, and two groups in the enhanced lab HFS section of the course?

2. Are there differences in faculty ratings of students’ clinical competence that varies in four groups of students, two groups in the traditional lab section and two groups in the enhanced lab HFS section from midterm to final evaluation?

Organizing Framework

which can be used to evaluate self-confidence and clinical competence in nursing students.

**Definition of Terms**

**Conceptual: Student self-confidence.**

Self-confidence was defined as: calm/confident manner, well-planned interventions/flexibility, evaluation/self-analysis, and commitment to improvement (Lasater, 2007).

**Operational: Student Self-confidence.**

Lasater’s Rubric, based on Tanner’s Model (2006), consists of four subscales: noticing, interpreting, reflecting, and responding, with 11 items rated from beginning (1) to, exemplary (4).

**Conceptual: Student Clinical Competence.**

Clinical competence was defined as: recognizing deviations from expected patterns, information seeking, prioritizing data, and clear communications (Tanner, 2006, as cited in Blum et al., 2010).

**Operational: Student clinical competence.**

Clinical competence was measured by student and faculty ratings on a 4 point Likert Scale ranging from beginning (1) to exemplary (4) (Blum et al., 2010).
Limitations

This study is limited by the small sample size and homogeneity of the sample.

The study is restricted to 60 junior students in an entry-level Bachelor of Science (BSN) nursing program.

Assumptions

1. Student self-confidence is an important factor in the development of clinical competence in nursing education.
2. HFS may enhance student self-confidence and clinical competence.

Summary

Nursing students need self-confidence to practice and perfect clinical skills. This study will be conducted to analyze the impact of high-fidelity simulation on student self-confidence and clinical competence. This study will partially replicate Blum et al.’s (2010) study to discover whether HFS increases student self-confidence and clinical competence in a clinical nursing course over one semester. The Lasater Clinical Judgment Rubric will be framework for the study. The design is a quantitative, quasi-experimental design. The findings will support the body of knowledge regarding the use of HFS in nursing education to increase self-confidence and improve clinical skills in practice.
Chapter II

*Literature Review*

*Introduction*

In an increasingly complex and ever-changing health care environment, nurse educators are continually developing strategies to increase the self-confidence and clinical competence of nursing students. The promotion of self-confidence and clinical competence directly impacts the development of clinical judgment and safe nursing practice (Blum et al., 2010).

High-fidelity simulation (HFS) has been recommended as a teaching-learning strategy to increase student self-confidence and clinical competence. This study is a partial replication of Blum et al.’s (2010) study.

*Research Questions*

1. Are there differences in student self-confidence in four groups of students, two groups in the traditional lab section of the course, and two groups in the enhanced lab HFS section of the course?

2. Are there differences in faculty ratings of students’ competence that varies in four groups of students, two groups in the traditional lab section and two groups in the enhanced lab HFS section at midterm and final evaluation?
Organization of Literature

The literature review consists of studies which examine the role and effectiveness of high-fidelity simulation in nursing education. The literature review is organized into four sections: (a) organizing framework, (b) clinical simulation: student’s self-confidence, (c) clinical simulation: student’s knowledge, and (d) clinical simulation: critical thinking.

Organizing Framework

Tanner’s Clinical Judgment Model (2006) provides the organizing framework for this study. Tanner’s (1998, 2006) research was based on a review of the nursing literature regarding clinical judgment in nursing. Clinical judgment was defined as making conclusions based on interpretations about patients’ needs. Tanner defined clinical judgment as the interpretation of the patient’s health needs or issues, and the nurse’s decision to act on patients’ needs. Tanner defined clinical reasoning as the process by which nurses make judgments. This includes the thoughtful process of coming up with interventions and weighing against the evidence. It also includes practical reasoning based on previous experience, such as recognizing a pattern or clinical intuition (Tanner). Clinical reasoning refers to a process by which nurses generate and weigh decisions about the conclusions (Tanner). According to Tanner, nurses adapt to clinical situations by having self-confidence and competence by using critical thinking.
A research based model of clinical judgment in nursing is a rubric that delineates a task and facilitates communications. Tanner’s Model of Clinical Judgment (2006) involves four phases: noticing, interpreting, responding, and reflecting. Tanner emphasized the integrated roles of noticing, interpreting, responding, and reflecting. Tanner defined interpreting as the nurse’s expectation of the situation. The expectation may be derived from the nurse’s previous experience, the nurse’s knowledge of the patient or similar patients, and the nurse’s clinical or textbook knowledge. Noticing is the nurse’s initial grasp on the situation. Tanner (2006) defined this as a “perceptual grasp of the situation at hand” (p. 208). Noticing then triggers the nurse to use one or more reasoning patterns (analytical, intuitive or narrative). Interpreting is the development of an adequate understanding of the situation in order to respond. Responding involves deciding on an appropriate course of action for the situation. In interpreting and responding, the nurse uses reasoning patterns to collect more data, interpret the data, and come to a reasonable response and intervention.

Tanner (2006) defined two types of reflection: reflection-in-action and reflection-on-action. Reflection-in-action refers to how well the nurse can read the patient and determine how the patient is responding to the intervention, and if the intervention should be adjusted. The nurse is still attending to the patient’s responses to the actions and needs. Reflection-on-action and the clinical learning that is gained, ends the cycle. This type of reflection reviews the outcomes of the situation and focuses on the appropriateness of actions in each phase of the model. What a nurse learns in a given
situation adds to the clinical knowledge base and influences how the nurse responds in future clinical situations.

Lasater (2007) used Tanner’s Model to develop several dimensions for the Lasater Clinical Judgment Rubric. Lasater’s Clinical Judgment Rubric quantifies the development of clinical judgment when working with nursing students. Clinical judgment is the highly contextual thinking and evaluative processes that focus on a response to a patient’s complex problems (Lasater). This rubric evaluates the student’s experience, aptitude for critical thinking, student self-confidence, and clinical judgment skill. This model provides a way to quantify and communicate with students about clinical judgment. Lasater stated that nurse judgments do not necessarily follow linear patterns that are taught. Nurse judgments are not strictly based on cognitive understanding; rather judgments are based on theory and experience. Nursing judgments are “fluid” and use a variety of ways of knowing.

Lasater tested the Tanner Model through qualitative research with nursing students. Baccalaureate students in a clinical nursing course participated in the simulation. Two groups of 12 students used the human patient simulator with an activity with each student being the primary nurse. Observations of faculty were scored with the Rubric. Students performed well, and Lasater concluded that Tanner’s model is useful in schools of nursing, and is effective in teaching beginning students one type of problem solving used in nursing. From this study Lasater developed the Lasater Clinical Judgment Rubric (LCJR).
Clinical Simulation: Student’s Self Confidence

Nursing skills are gained more quickly and retained longer when students have hands-on simulation experience. One area in which simulation is helpful for nursing students is the interpretation of cardiac arrhythmias, and the development of nursing interventions for the cardiac patient. Childs and Sepples’ (2006) study examined the simulation development and implementation process, and measured student satisfaction as an outcome. The simulation model designed by the National League of Nursing (NLN) and Laerdal provided the framework. This study was part of a larger study to test the reliability and validity of two instruments used in a national simulation study (Jeffries & Rizzolo, 2006).

Childs and Sepples’ (2006) study took place at the College of Nursing and Health Professions at the University of Southern Maine (USM). The simulation occurred during the senior capstone course skills laboratory. Students were from both the traditional baccalaureate program and the second degree program. Forty-five students participated in the simulation, and were informed of the study prior to participating in the skills laboratory.

Students completed a University of Southern Maine (USM) specific instrument. The USM instrument has a 13-item scale in which students rated the level of confidence gained through simulation, usefulness of simulation, and beliefs about the teaching method. At the end of the laboratory experience, students were also asked to rank the four stations in the laboratory in order of personal preference. The four stations were: identifying cardiac arrhythmias, identification of rhythm strips, arrhythmia case studies,
and Sim Man mock-code. One purpose of the study was to test the reliability and validity of two instruments used in the larger national study (Jeffries & Rizzolo, 2006). The Educational Practice Scale for Simulation (EPSS), is a 16-item instrument and has a 5-point scale to measure whether four educational practices are present in the simulation, and the importance of each practice to the learner. The Simulation Design Scale (SDS) is a 20-item scale that asks students to evaluate five design features of the simulation (Childs & Sepples, 2006).

Findings from the USM instrument in Childs and Sepples’ (2006) study were that the most important features of the simulation were feedback and information/objectives. Students ranked the level of complexity and fidelity as important. The educational practice rated as most important was feedback, followed by collaboration, active learning, high expectations, and diverse learning opportunities. Overall, the students rated the simulation as a positive experience. Students identified the mock code as the personal preference of the laboratory. The EPSS and the SDS were found to be reliable instruments and detailed analysis will be included in the larger national study.

Both students and faculty reported that the time in the simulation laboratory was too short, and more time was needed. Students also found Sim Man’s recorded comments by faculty distracting due to three different voices being used. The room used involved all four stations, and was too noisy according to students and faculty (Childs & Sepples, 2006).

Childs and Sepples (2006) learned several valuable lessons in regards to planning and implementing successful simulation laboratories. The lessons included: allowing
adequate time for simulation and debriefing, separating stations into different rooms, and careful planning with attention to detail. The EPSS and the SDS are reliable and valid instruments that can be used. The authors concluded that feedback and objectives/information are the most important features of the simulation, followed by level of complexity and fidelity. Overall the students believed the simulation to be a worthwhile and valuable experience.

The National League of Nursing (NLN) and Laerdal sponsored a national, multi-site, multi-method study on the design, implementation, and use of simulation in nursing. The project was completed in four phases. Phase three, part two of the study, compared the teaching/learning experience related to care of an adult post-operative patient in three simulation groups (paper/pencil case study, static mannequin and high-fidelity patient simulator) (Jeffries & Rizzolo, 2006). The purposes of the study were to develop and test models that nursing faculty can implement when using simulation; to develop a group of nursing faculty who can use simulation in innovative ways; to contribute to the improvement of the body of knowledge regarding the use of simulation in nursing education; and to show the value of collaboration between corporate and non-for-profit organizations (Jeffries & Rizzolo).

Phase three, part two included 403 students enrolled in the first medical-surgical nursing course. Sixty-two percent were in baccalaureate programs, and 38% were in associate degree programs. All participants completed a pretest, and viewed a videotape of a lecture and simulation depicting care of a postoperative patient. Students were then randomly assigned to one of three simulation groups (Jeffries & Rizzolo, 2006).
All three groups were provided the same 20 minute simulation. All students participated in a 20 minute reflective thinking session after the simulation. Students then completed the EPSS and SDS, as well as the other items (Jeffries & Rizzolo, 2006).

The Educational Practices in Simulation Scale (EPSS) and the Simulation Design Scale (SDS) were used to gather data. The EPSS is a 16-item instrument which uses a 5-point scale to measure whether four educational practices are present in the simulation, and the importance of each practice to the learner. The Simulation Design Scale (SDS) is a 20-item scale that asks students to evaluate five design features of the simulation. The reliability for the SDS was reported as a Cronbach’s alpha of 0.92 for presence of features, and 0.96 for importance of features. The reliability for the EPSS was reported as a Cronbach’s alpha of 0.86 for presence of specific practices, and 0.91 for importance of specific practices (Jeffries & Rizzolo, 2006).

Two other instruments measured self-confidence and satisfaction: the Student Satisfaction with Learning Scale (reliability reported with a Cronbach’s alpha of 0.94), and the Self-Confidence in Learning Using Simulations Scale (reliability reported with a Cronbach’s alpha of 0.87). Cognitive gain or knowledge was measured by comparing scores on multiple choice tests designed to be similar to National Council Licensure Examination (NCLEX) RN type questions. The Self-Perceived Judgment Performance Scale (reliability reported with a Cronbach’s alpha of 0.90) was used to measure higher order thinking (Jeffries & Rizzolo, 2006).

Findings from the SDS showed the following: the high-fidelity group reported a greater sense of reality, the paper/pencil group reported receiving less feedback, and the
high-fidelity and static mannequin groups reported more problem-solving opportunities. Findings from the EPSS showed the following: the high-fidelity group reported the greatest sense of being involved in diverse ways of learning, the paper/pencil group perceived higher expectations and collaboration, and participants in both simulator groups perceived a greater sense of active learning (Jeffries & Rizzolo, 2006).

There were no significant differences in knowledge gains among the three groups according to the results of the multiple choice item tests. Responses on the Satisfaction Scale revealed the high-fidelity group had a significantly higher level of satisfaction than the other groups (Jeffries & Rizzolo, 2006).

Responses from the Self-Confidence Scale showed that students in both simulator groups reported significantly greater confidence than did the students in the paper/pencil group. Responses on the Self-Perceived Judgment Performance Scale showed no significant difference among the three groups (Jeffries & Rizzolo, 2006).

The researchers concluded that high-fidelity patient simulation incorporates more of the principles of best practice in education. Learning through paper/pencil case studies is not as effective at increasing student self-confidence as simulation is. High-fidelity simulation resulted in the highest level of satisfaction and self-confidence. The researchers went on to conduct a fourth phase to expose participating students at two of the eight sites to both high-fidelity and static mannequin simulations (Jeffries & Rizzolo, 2006).
There is an increasing amount of research which supports the use of high-fidelity simulation (HFS) in nursing education. There is little research about the factors that lead to outcomes observed in high-fidelity simulation. Smith and Roehrs’ (2009) study examined factors correlated with two outcomes of high-fidelity simulation: student satisfaction and self-confidence. The Nursing Education Simulation Framework provided the theoretical framework.

Smith and Roehrs’ (2009) study took place in a school of nursing in a public university in the western United States. The sample consisted of 68 junior students in a traditional Bachelor of Science (BSN) program. The students were enrolled in the first medical-surgical nursing course. As a requirement of the course all students participated in a high-fidelity simulation experience related to the care of a patient with a respiratory disorder. The simulation was a requirement; however participation in the study was not. Sixty-eight students participated in the study.

The researchers designed a demographic instrument to describe the sample and assess the possibility of correlation of demographic characteristics to student satisfaction and self-confidence (Smith & Roehrs, 2009). Two instruments developed by the National League for Nursing (NLN) were used in the study: the Student Satisfaction and Self-Confidence in Learning Scale and the Simulation Design Scale (SDS). Content validity was established for both instruments by a review of experts. The Student Satisfaction and Self-Confidence in Learning Scale had reported Cronbach’s alphas of 0.94 for the Satisfaction subscale, and 0.87 for the Self-Confidence subscale. The SDS
had a reported Cronbach’s alpha of 0.92 for five subscales (objectives, support, problem-solving, feedback and fidelity) (Jeffries & Rizzolo, 2006, as cited in Smith and Roehrs).

Five research questions were asked:

1. How satisfied are BSN nursing students with an HFS scenario experience?
2. What is the self-reported effect of an HFS scenario experience on BSN student self-confidence?
3. How do BSN nursing students evaluate an HFS scenario experience in terms of how well five simulation design characteristics are present in the experience?
4. Is there any correlation between the perceived presence of design characteristics and reports of satisfaction and self-confidence of BSN nursing students who take part in an HFS experience?
5. Is there any correlation between demographic characteristics of BSN nursing students and reports of satisfaction and self-confidence after an HFS experience? (Smith & Roehrs, 2009, p. 75).

The mean score for the Satisfaction subscale of the Student Satisfaction and Self-Confidence in Learning Scale was 4.5 (SD=0.5) on a Likert scale of 1-5. The mean score for the Self-Confidence subscale was 4.2 (SD=0.4). Scores from the SDS showed the design characteristic with the highest mean score was Guided Reflection (M= 4.8, SD=0.4). The lowest score was Objectives (M=4.4, SD=0.5), which was only slightly lower than the highest score (Smith & Roehrs, 2009).
The design subscale with the highest correlation to both student satisfaction and self-confidence was Objectives. Statistically significant correlations were noted using Spearman’s Rho. Using Spearman’s Rho, no significant correlations were found between any of the demographic characteristics and reports of student self-confidence or student satisfaction (Smith & Roehrs, 2009).

The authors concluded that design factors in HFS may impact the outcomes of student satisfaction and self-confidence. Nursing faculty must keep this in mind when designing HFS scenarios for nursing students. Objectives and Problem Solving are the two design characteristics identified as significant in Smith and Roehrs’ (2009) study.

Nurse educators use clinical simulations as a way of promoting experiential learning and repetitive practice. The purpose of Bambini, Washburn and Perkins’ (2009) study was to evaluate simulated clinical experiences as a teaching method to increase the self-efficacy of nursing students. The researchers used self-efficacy (Bandura, 2004) as the framework for the 2009 study. Self-efficacy is an indication of the student’s preparation to successfully accomplish a task.

The study was conducted at a midsized college of nursing in a Midwestern state (Bambini et al., 2009). The population was baccalaureate nursing students in the first semester of undergraduate clinical experiences. The study was conducted over four semesters with 224 students. Participation in simulation was a required portion of the course; however participation in the survey was optional. The final sample included 112 (50%) students who completed both pretest and posttest surveys.
The authors used an integrated, quasi-experimental, repeated-measures design. Students participated in a 3 hour postpartum simulation in the laboratory, designed to help prepare students for acute maternal-infant clinical experience. The laboratory involved eight stations ranging from low-fidelity to high-fidelity simulation. The instrument to measure self-efficacy consisted of six questions using a 10-point scale and three open ended questions. The open-ended questions addressed confidence, communication, and clinical judgment. The 10-point scale ranged from 1=not at all confident to 10=very confident. The higher scores indicated a higher level of self-efficacy. The scores for the 112 students pretest and posttest surveys were calculated to obtain the postpartum exam self-efficacy scores. Internal consistency was reported as a Cronbach’s alpha of 0.817 for pretest and 0.858 for posttest. The authors used a method similar to the constant comparison method of Glaser and Strauss (1967) to identify themes expressed by participants who answered the open-ended questions (Bambini et al., 2009).

Pairwise comparison analysis of the post-partum exam self-efficacy scores showed a significant increase in students’ confidence in performing a postpartum exam after the simulation. The individual items were also analyzed, indicating a significant increase in confidence for each skill. Two skills, the measuring of vital signs and performing a breast exam, had a significant increase in confidence with more tied-ranks than the other variables (Bambini et al., 2009).

The qualitative data indicated the students found the simulation to be a good learning experience. Students’ confidence was increased in relation to what to expect in
the clinical setting. Students experienced the greatest increase in confidence related to assessing the fundus. Data from the open-ended questions identified three themes: communication, confidence, and clinical judgment (Bambini et al., 2009).

The authors concluded that simulations increase students’ self-efficacy to perform clinical skills. It was apparent to Bambini et al. (2009) that students struggle with applying theoretical information to clinical situations. The authors support the use of clinical simulation in preparation for clinical experience in the real world.

Nurse educators are challenged to provide nursing students with opportunities to develop self-confidence and clinical competence. High-fidelity simulation (HFS) is one strategy used as a teaching opportunity, however there is little research supporting its effectiveness of increasing student self-confidence and clinical competence. The purpose of Blum et al.’s (2010) was to examine the relationship between simulation, student self-confidence and clinical competence. Tanner’s Clinical Judgment Model and Lasater’s Clinical Judgment Rubric provided the theoretical framework for Blum et al.’s (2010) study.

The study was conducted at a southeastern university in the United States. The sample was entry-level Bachelor of Science nursing students in the junior year. The study was designed in the context of a health assessment and skills course (Blum et al., 2010). Students were enrolled in one of three laboratory sessions that met weekly for a total of 7 hours of instruction and practice.
The Lasater rubric was used to grade simulations, and consists of four subscales: noticing, interpreting, reflecting, and responding based on Tanner’s model. Using a Likert-type scale, with 1=beginning and 4=exemplary, students and faculty responded to 11 items. The instrument was reported to have inter-rater reliability (alpha .87). Interconsistency of the subscales were reported to be Cronbach’s alpha range of .886 to .931. Items from the rubric were selected by the researchers to measure nursing students’ self-confidence and clinical competence (Blum et al., 2010).

Student mid-term and final self-confidence ratings significantly, positively, correlated. Scores were significantly different using a t-test. Faculty ratings of clinical competence at mid-term and final were not significantly statistically different for the groups. Cross-tabulation for competence of all students revealed 38 students in the exemplary rating at final assessment, versus 16 at mid-term (Blum et al., 2010).

Results indicated students’ self-confidence and competence increased regardless of traditional or simulation laboratory enrollment. “Independent-samples t-tests showed no statistically significant differences between mean self-confidence scores of students in the two groups at either midterm or final assessment points” (Blum et al., 2010, p.8). T-tests evaluating faculty ratings of student competence revealed no significant difference at either testing point.

The conclusion indicated high-fidelity simulation may not improve self-confidence and clinical skills with pre-licensure students. The authors suggested that higher-level students would benefit more from simulation. Findings showed greater growth in the area of competence than in self-confidence (Blum et al., 2010).
It is difficult for nurse educators to provide students with the opportunity to prioritize and delegate patient care while maintaining patient safety in the clinical setting. Using simulations in addition to case studies may increase nursing students’ ability to prioritize and delegate. The purpose of Kaplan and Ura’s (2010) study was to evaluate students’ confidence and ability to prioritize, delegate, and implement patient care for numerous patients through simulation based learning (SBL). The American Association of Colleges of Nursing’s recommendations regarding the inclusion of instruction in prioritization and delegation provided the organizing framework for Kaplan and Ura’s (2010) study.

The study was conducted at a school of nursing in a university in the southern United States. Ninety-seven senior nursing students in the final semester were assigned to a group of 10-12 students. Students participated in a 4-hour simulation-based learning (SBL) experience. The SBL used three patient simulators, case study analysis, and debriefing (Kaplan & Ura, 2010). The students performed different roles in the care of three different simulated patients with varying patient care scenarios.

The researchers used an anonymous survey placed on Blackboard in which the students evaluated the SBL experience. Participating students completed surveys after the SBL. Students rated eight statements about the SBL experience on a scale ranging from 5 = strongly agree to 1 = strongly disagree. Statements evaluated students’ confidence to prioritize and delegate patient care and work as a team (Kaplan & Ura, 2010).

Sixty-eight percent of students agreed or strongly agreed that SBL increased understanding of prioritizing and delegating care. Fifty-five percent of students agreed or
strongly agreed that SBL increased confidence in prioritizing and delegating care. Seventy-eight percent of students reported more confidence in ability to work as a team. Sixty-six percent reported that case studies increased understanding. More students (78%) reported an increased confidence in the ability to work as a team than confidence in prioritizing and delegation of care (55%) (Kaplan & Ura, 2010).

Kaplan and Ura (2010) concluded simulation-based learning increases student confidence and skill in delegating and prioritizing patient care. Delegation and prioritization are challenging concepts for nursing students that impact professional practice after licensure. Further study is needed to determine if simulation is an effective method for teaching prioritization and delegation.

Clinical Simulation: Student Knowledge

The use of simulation in nursing education has increased, which has resulted in increased expenses and time to schools of nursing. The expense must be justified by assessing the knowledge acquired through simulation. Levett-Jones, Lapkin, Hoffman, Arthur, & Roche (2011) conducted a study to evaluate the effect of medium and high-fidelity simulations on nursing students’ knowledge acquisition.

The study was conducted in a school of nursing in Australia. Third year nursing students in a Bachelor of Nursing program were invited to take place in a simulation learning experience. A total of 84 third year students participated (Levett-Jones et al., 2011).
The authors used a quasi-experimental design. The participants completed the Health Sciences Reasoning Test (HSRT), and were placed into matched pairs based on the score. The pairs were then randomly assigned to either the control group (medium fidelity) or the experimental group (high fidelity). The groups participated in a 20 minute simulation scenario involving a deteriorating patient with pulmonary edema and hypovolemia. Both groups participated in a 20 minute debriefing (Levett-Jones et al., 2011).

The simulation scenario was reviewed by an expert panel to establish content validity. Knowledge acquisition was measured using a pre and posttest design. The multiple choice questions were selected from a validated commercial test bank. The test was administered prior to the simulation (Test 1), immediately after the debriefing (Test 2), and again 2 weeks later (Test 3) (Levett-Jones et al., 2011).

Mean pre-test (Test 1) knowledge scores for the control group were 11.833. Mean pre-test scores for the experiential group were 12.523. An independent t-test score showed no statistically significant difference between the scores (t [82] = -1.233, p>0.05) (Levett-Jones et al., 2011).

Mean test scores for Test 2 were 11.763 (control) and 12.667 (experimental). An independent t-test determined the difference was not statistically significant (t [75] = -1.386, p>0.05). Mean knowledge scores for Test 3 were 12.806 for the control group, and 13.212 for the experimental group. The differences between scores were moderate, but not statistically significant (t [67] = -0.0644, p >0.05) (Levett-Jones et al., 2011). Analysis of covariance (ANCOVA) was performed to determine whether changes in
knowledge scores occurred over time. There was some improvement in scores in both groups; however this improvement was not statistically significant (Levett-Jones et al., 2011).

The authors questioned whether or not multiple choice questions are the best evaluator of knowledge acquisition following simulation. The authors questioned whether the increased cost of high-fidelity simulators is justified. The authors concluded that high-fidelity simulation may not provide knowledge gains over medium-fidelity simulation (Levett-Jones et al., 2011).

The use of clinical simulation in nursing has increased, however more information is needed to understand knowledge acquisition in clinical simulation. Schlairet and Pollock (2010) conducted a study to determine the effects of clinical simulation on undergraduate nursing students’ knowledge acquisition. The framework for this study was based on the American Association of Colleges of Nursing’s (AACN’s) The Essentials of Baccalaureate Education for Professional Nursing Practice. The hypothesis was: “Clinical simulation, in an undergraduate fundamentals course, teaches basic nursing care concepts as well as traditional clinical experiences” (Schlairet & Pollock, 2010, p. 43). The researchers tested the hypothesis that simulation, followed by traditional clinical, teaches the basic concepts as well as the reverse sequence does, using a cross-over design. Students participated in each intervention for a 2-week time period. The clinical simulation used a high-fidelity patient simulator. Traditional clinical experience took place in a long-term care facility.
The study was conducted in a state college of nursing in the southern United States. Baccalaureate nursing students who were enrolled in a nursing fundamentals course over two consecutive semesters were invited. Random assignment was made to an intervention group (simulated-traditional or traditional-simulated). A total of 74 students participated (Schlairet & Pollock, 2010).

The dependent outcome was the students’ knowledge test scores. Researchers developed a 100-point scale knowledge test, which contained 25 multiple choice questions from a NCLEX-RN study book. Internal consistency reliability coefficients were within an accepted range (Schlairet & Pollock, 2010). This was used as the pre-test and post-tests one and two.

Analysis of chi-square showed no significant differences between the two semester groups and intervention groups. T-tests also showed no significant differences between groups on knowledge pre-test scores, midterm grade, or course final grade. T-tests showed significant knowledge score differences from pre-test to post-test. Significant knowledge was gained after the traditional and simulation experiences. The knowledge scores between the traditional and simulated groups were statistically equivalent (Schlairet & Pollock, 2010).

Schlairet and Pollock (2010) concluded that clinical simulation benefits undergraduate nursing students’ knowledge acquisition as well as traditional clinical experiences did in a Fundamentals of Nursing course. The authors stated that new learning formats, such as simulation, can address problems that limit students’ learning experiences and restrict access to traditional clinical learning settings.
There is a lack of evidence about the effects of high-fidelity simulation on learning and its relationship to clinical judgment. The purpose of Lasater’s (2007) study was to examine the effect of high-fidelity simulation experiences on nursing students’ development of clinical judgment. The framework was the Lasater Interactive Model of Clinical Judgment Development, which includes four components: confidence, aptitude, skill and experience.

The study was conducted at Oregon Health and Science University (OHSU) School of Nursing (Lasater, 2007). Forty-eight junior-level students (47 women, 1 man) were enrolled. Two groups of 12 students each attended a simulation laboratory one morning per week in place of the clinical practica for Nursing Care of the Acutely Ill Adult III. Thirty-nine of the students were observed by the author and included in the focus group. Criteria for inclusion were nursing students who participated in the simulation laboratory. Eight students were non-traditional students. Ages ranged from 24-50.

The study was embedded in a larger study (Lasater, 2005) and used focus groups to collect data. The focus groups took place in the simulation laboratory, and the 90-minute sessions were videotaped. Using Morgan’s (1997) principles for focus group facilitation, the researcher reviewed the definition of clinical judgment, and six pre-determined questions were used in the discussion. Lasater (2007) identified 13 themes.
from the focus groups. Students identified strengths and weaknesses of simulation for nursing education. Simulation integrated topics from lecture and laboratory that required critical thinking. Students believed simulation allowed the experience of a patient population that may not be experienced during a clinical rotation. Students also pointed out weaknesses, such as assessment types that were not accessible in simulation. A strong desire for more direct feedback from the facilitator was reported. Students learned from observing and hearing other students during the simulation (Lasater).

Lasater (2007) concluded that students’ experiences in the high-fidelity simulation laboratory identified some issues that may assist nursing faculty when implementing a simulation-laboratory as part of the curriculum. The main areas included: improving the debriefing process, more structured observation, and increasing the amount of time for simulation. While high-fidelity simulation is a valuable component in the development of clinical judgment, more research is needed.

It is important for nurse educators to use teaching strategies that assist in the development of critical thinking skills. The purpose of Sullivan-Mann, Perron and Fellner’s (2009) study was to determine the effect of simulation on critical-thinking abilities of associate degree nursing students. The Roy Adaptation Model was the framework.

The study was conducted at an associate degree nursing program in the midwestern United States. Participants included 56 students in the Nursing II course. The final sample included 53 (94.6%) students. The 53 students were divided among seven clinical instructors, and within each group, half were randomly assigned to the
experimental group. The control group had two simulation sessions that were required by the curriculum, and the experimental group had five sessions (Sullivan-Mann et al., 2009).

The authors used a pretest and posttest design. The authors used the Health Sciences Reasoning Test (HSRT), which is a computer-based testing instrument that assesses the critical-thinking skills of students in the health sciences. The HSRT consists of 33 multiple choice items that test five critical-thinking cognitive skills: interpretation, analysis, evaluation, explanation, and inference, with subscales for inductive and deductive reasoning. The authors stated this tool was chosen due to its established reliability and validity (Sullivan-Mann et al., 2009).

There were no significant differences between the experimental and control groups’ HSRT scores at pretest. An independent samples t-test was conducted on total mean scores at pretest. There were no significant differences between the groups’ HSRT scores. The experimental group did not learn at a different rate than the control group (Sullivan-Mann et al., 2009).

To test for the effect of simulation on each group individually, one-factor ANOVAs were conducted on the total HSRT scores at pretest and posttest. The experimental group answered more questions correctly at posttest than at pretest. The control group improved, but did not answer significantly more questions correctly on the posttest than the pretest (Sullivan-Mann, et al., 2009).
A series of ANOVAs was performed to test the effect of simulation on the subtest scores. Significant main effects were found for deductive reasoning and analysis. Both groups did significantly better at posttest. The between-groups comparison approached significance for deductive reasoning and was significant for analysis (Sullivan-Mann et al., 2009).

Sullivan-Mann et al. (2009) concluded that simulation was effective in increasing critical thinking scores. The authors stated that it is essential to collect more quantitative data about the effects of simulation on nursing students’ critical thinking skills.

There is a need to examine the relationship between teaching methods and critical thinking. A diploma nursing program initiated a simulation clinical learning experience at a multi-disciplinary facility for simulation-based education. The purpose of Lewis and Ciak’s (2011) study was to investigate the impact of simulation laboratory experiences on critical thinking, student satisfaction, self-confidence, and cognitive learning. The framework of the study was critical thinking.

The study was conducted in a diploma nursing program in the eastern United States, which is part of a community teaching hospital within a regional health system. The authors used a convenience sample of senior nursing students in a pediatric and obstetrical nursing course over a four-semester period. Sixty-three students participated in one simulation day. The control group was another group of students who took the course during a summer semester without the use of simulation (Lewis & Ciak, 2011).
The National League of Nursing’s (NLN) Student Satisfaction and Self-Confidence in Learning tool was used to assess student satisfaction and self-confidence in relation to the simulation experience. The 13-item tool uses a scale of 1 to 5, with 1=strongly disagree and 5=strongly agree. Cronbach’s alpha for the tool was reported as 0.94 for satisfaction, and 0.87 for self-confidence. The Nursing Care of Children and Maternal Newborn test provided by Assessment Technologies Institute (ATI) was used to assess critical thinking and knowledge gain. This tool is a commercial testing product, and contains 20-questions related to maternal-newborn care. A pre and posttest design was used to assess cognitive gain (Lewis & Ciak, 2011).

A significant gain in knowledge was found between pre and posttest scores on the ATI Nursing Care of Children and Maternal Newborn test. The mean pretest score was 0.664, and the mean posttest score was 0.823. A statistically significant increase in knowledge was found by using a paired student t-test (p<0.005) (Lewis & Ciak, 2011).

The mean for satisfaction on the Student Satisfaction and Self-Confidence in Learning was 4.33, and the mean for self-confidence was 4.35 (5 point Likert scale). No significant results were determined in the area of critical thinking (Lewis & Ciak, 2011).

Researchers stated that no definitive conclusions can be made regarding critical thinking and high-fidelity simulation. On some critical thinking components of the ATI, scores were higher in the participating group than in the control group. However, opposite results were seen in other critical thinking areas. Researchers concluded that simulation increases knowledge and student confidence in performing skills (Lewis & Ciak, 2011).
Summary of Findings

Clinical Simulation: Student’s Confidence.

Childs and Sepples’ (2006) study examined the simulation development and implementation process, and measured student satisfaction as an outcome. Findings from the study were that the most important features of the simulation were feedback and information/objectives, followed by level of complexity and fidelity. The authors concluded that simulation was a positive experience for increasing students’ level of confidence.

One of the purposes of the National League of Nursing (NLN) and Laerdal (Jeffries & Rizzolo, 2006) study was to compare the teaching/learning experience related to the care of an adult post-operative patient in three simulation groups (paper/pencil case study, static mannequin and high-fidelity patient simulator). Findings from the study showed the high-fidelity group reported a greater sense of reality and reported more problem-solving opportunities. The high-fidelity group reported the greatest sense of being involved in diverse ways of learning, and participants in both simulator groups perceived a greater sense of active learning. The researchers concluded that high-fidelity patient simulation incorporates more of the principles of best practice in education. High-fidelity simulation resulted in the highest level of satisfaction and self-confidence.

Smith and Roehrs’ (2009) study examined factors correlated with two outcomes of high-fidelity simulation: student satisfaction and self-confidence. The authors found the design subscale with the highest correlation to both student satisfaction and self-confidence was Objectives. Objectives and Problem Solving were the two design
characteristics identified as significant. The authors concluded that design factors in high-fidelity simulation may impact the outcomes of student satisfaction and self-confidence.

The purpose of Bambini et al.’s (2009) study was to evaluate simulated clinical experiences as a teaching method to increase the self-efficacy of nursing students. The findings showed a significant increase in students’ confidence in performing a postpartum exam after the simulation. The qualitative data indicated the students’ confidence was increased in relation to what to expect in the clinical setting. The authors concluded that simulations increase student self-efficacy to perform clinical skills.

The purpose of Blum et al.’s (2010) study was to examine the relationship between simulation, student self-confidence, and clinical competence. Results indicated student self-confidence and competence increased regardless of traditional or simulation laboratory enrollment. Findings showed greater growth in the area of competence than in self-confidence. The authors concluded that high-fidelity simulation may not improve self-confidence and clinical skills with pre-licensure students.

Evaluating students’ confidence and ability to prioritize, delegate, and implement patient care for numerous patients through simulation based learning (SBL), was the purpose for Kaplan and Ura’s (2010) study. Findings indicated an increase in students’ confidence to prioritize and delegate patient care and work as a team. The authors concluded simulation-based learning increases student confidence and skill in delegating and prioritizing patient care.
Clinical Simulation: Student Knowledge.

The purpose of the Levett-Jones et al. (2009) study was to evaluate the effect of medium and high-fidelity simulations on nursing students’ knowledge acquisition. The findings showed that differences between control group and experimental group scores were moderate, but not statistically significant. The authors concluded that high-fidelity simulation may not provide knowledge gains over medium-fidelity simulation.

The purpose Schlairet and Pollock’s (2010) study was to determine the effects of clinical simulation on undergraduate nursing students’ knowledge acquisition. The findings showed no significant differences in test scores between simulated-traditional and traditional-simulated groups. The authors concluded that clinical simulation benefits undergraduate nursing students’ knowledge acquisition as well as traditional clinical experiences did in a Fundamentals of Nursing course.

Clinical Simulation: Critical Thinking.

The purpose of Lasater’s (2007) study was to examine the effect of high-fidelity simulation experiences on nursing students’ development of clinical judgment through focus groups. Students identified strengths and weaknesses of clinical simulation. The study concluded that students’ experiences in the high-fidelity simulation laboratory identified some issues that may assist nursing faculty when implementing a simulation-laboratory as part of the curriculum. The main areas included: improving the debriefing process, more structured observation, and increasing the amount of time for simulation.
The purpose of Sullivan-Mann et al.’s (2009) study was to determine the effect of simulation on critical-thinking abilities of associate degree nursing students. The findings showed significantly increased test scores for the experimental (simulation) group. Significant main effects were found for deductive reasoning and analysis. The study concluded that simulation was effective in increasing critical thinking scores.

The purpose of the Lewis and Ciak’s (2011) study was to investigate the impact of simulation laboratory experiences on critical thinking, student satisfaction, self-confidence, and cognitive learning. Findings showed a significant gain in knowledge between pre and posttest scores. A statistically significant increase in knowledge was found. No significant results were determined in the area of critical thinking. Researchers stated that no definitive conclusions can be made regarding critical thinking and high-fidelity simulation. The study concluded that simulation increases knowledge and student confidence in performing skills.
Chapter III

Methodology

Introduction

Nursing students experience uncertainty and anxiety during clinical rotations. Students may be anxious about the knowledge, communications, and technical skills necessary to care for patients. This may cause students to question self-confidence. High-fidelity simulation (HFS) provides a low-risk opportunity for students to practice skills and reduce anxiety (Blum et al., 2010).

The purpose of this study is to examine differences in the self-confidence of four groups of students, two in the traditional clinical lab and two in the enhanced clinical simulation lab, and faculty ratings of the clinical competence of the students in a medical-surgical nursing course from midterm to final. This study is a partial replication of Blum et al.’s (2010) study that examined student self-confidence and competence in the clinical laboratory using HFS.

Research Questions

1. Are there differences in student self-confidence in four groups of students, two groups in the traditional lab section of the course, and two groups in the enhanced lab HFS section of the course?
2. Are there differences in faculty ratings of students’ competence that varies in four groups of students, two groups in the traditional lab section and two groups in the enhanced lab HFS section from midterm to final evaluation?

Population, Sample and Setting

The study will be conducted at a large, public university in the Midwestern U.S. Junior-level Bachelor of Science nursing students in the first medical-surgical nursing course, Nursing 110, Medical-Surgical Nursing I will be invited to participate. There are a total of 90 students in four laboratory sections. The anticipated sample size will be 60 students.

Protection of Human Rights

The study will be submitted for approval to the Institutional Review Board at Ball State University and the participating university. The study will be explained to the faculty in the school of nursing before data collection. A description of the study will be given to each student that includes a letter and description of the evaluation tools. Participation is voluntary. Grades will not be affected if students choose not to participate. Participants may withdraw at any time. Confidentiality will be maintained. All data will be anonymous and will not contain any personal data. No risks have been identified with this study. Benefits will be increasing the understanding of how HFS may increase student self-confidence and clinical competence.
**Procedures**

The researcher will contact the Director of the School of Nursing after IRB permission is obtained. The researcher will meet with the Director of the school to discuss the study. After the Director approves the study, the researcher will work with the faculty of the course and will schedule a meeting with course faculty to discuss the study. The faculty will receive a full explanation of the study and the tools to evaluate the students. After the faculty meeting, the researcher will meet with the students to explain the study. Students will receive a full explanation of the study and methods of evaluation.

All students will be enrolled in the Nursing 110, Medical-Surgical Nursing I course, and receive the same didactic and laboratory instruction. Students will be enrolled in one of four laboratory sections. Each section will meet weekly for a total of 7 hours of instruction and practice. The students will demonstrate skill competency through use of Laerdal’s Sim-Man on a variety of nursing skills and several patient conditions.

During the mid-term and final week of the first clinical practice course, students and clinical faculty will independently complete the Lasater Clinical Judgment Rubric (LCJR). Students will complete the LCJR under the supervision of the nursing course faculty during the laboratory simulation. Clinical faculty will complete the LCJR during the students’ clinical laboratory simulations.
**Instrumentation**

Based on Tanner’s (2006) model, the Lasater Clinical Judgment Rubric will measure student self-confidence and clinical competence. The Rubric consists of four-subcales: noticing, interpreting, responding, and reflecting. The LCJR consists of 11-items, and uses a 4-point Likert-type scale. Students and faculty respond using the continuum of perceived level of clinical judgment development: 1 (beginning), 2 (developing), 3 (accomplished), or 4 (exemplary). Based on the study by Blum et al. (2010), the instrument has an inter-rater reliability (alpha of 0.87), internal consistency of the subscales (Cronbach’s alphas range from 0.886 to 0.931), and established validity.

The researchers will use items from the rubric to evaluate students’ self-confidence and clinical competence. Students will respond to four items rating self-confidence from the Lasater rubric: calm/confident manner, well planned interventions/flexibility, evaluation/self-analysis, and commitment to improvement (Lasater, 2007, as cited in Blum et al., 2010). Faculty will rate clinical competence of students using four items from the Lasater rubric: recognizing deviation from expected patterns, information seeking, prioritizing data, and clear communication.

The following demographic data of the students will be reported: age, gender, and previous health care experience.

**Design**

A quasi-experimental design will be used for this study. A quasi-experimental design uses random assignment to groups. The student groups will be randomly selected...
to be in the traditional group (two groups) or the enhanced HFS group (two groups). A quasi-experimental design has limited controls to provide an alternate mean of examining causality in situations where experimental control is not feasible (Burns & Grove, 2009).

Data Analysis

An alpha level of 0.05 will mark statistical significance. The t-test will be used to examine differences between mid-term and final ratings of student, and faculty ratings of self-confidence and clinical competence. A t-test is used to determine if there are significant differences in means between two groups (Burns & Groves, 2005).

Summary

The purpose of this study is to examine changes in self-confidence of students, and changes in faculty ratings of the clinical competence in a medical-surgical nursing course. This study will partially replicate Blum et al.’s (2010) study in an attempt to discover whether HFS increases student self-confidence and clinical competence.

This study will be conducted to analyze the impact of high-fidelity simulation on student self-confidence and clinical competence. The Lasater Clinical Judgment Rubric will be the instrument to measure student self-confidence and clinical competence. The design is a quantitative, quasi-experimental design. The findings will contribute the body of knowledge regarding the use of HFS in nursing education. The results will indicate if HFS may increase student self-confidence and clinical competence.
References


