Impact of Simulation on Nursing Students' Self-Efficacy and Knowledge Related to HIV

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By

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Quote

"What lies behind us and what lies ahead of us are tiny matters compared to what lives within us."

-Henry David Thoreau

Dedication

To my loving and supportive husband Ryan, without you by my side during my course work and dissertation I could not have done it. You motivated me when I was down, and encouraged me when I was at my breaking point. Your unending faith and love is amazing, and I appreciate all you do for me. To Landon and Calle, thank you for being my biggest cheerleaders and for all your love and support. I only hope that my commitment to my education will be instilled upon you in all your future endeavors. My work is also dedicated to my guardian angel "Sonny" for motivating me to be a better person and make you proud. I know you are with me in spirit and watching over me.

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Abstract

The purpose of this quasi-experimental pre-posttest research study was to identify if using high fidelity simulation (HFS) as a nursing education teaching strategy improves senior level nursing students' knowledge of human immunodeficiency virus (HIV) and self-efficacy at a small, private Midwestern university. The sample size included a total of 43 senior level Bachelors of Science nursing students. Participants were between the ages of 21 and 40 years of age and were all female (100%). The mean age for the participants was 25.5 years of age. Data analysis using paired *t* test did not reveal statistical significance for the 25-item National Council Licensure Examinations (NCLEX) style HIV knowledge posttest following the HFS with an HIV patient. Results of the pre-posttest multiple-choice questions showed that participants had a 64.00 % average before the HFS and a 64.47% average post simulation. A mixed factorial analysis of variance (ANOVA) comparing the 25-question results of participants with and without experience caring for an HIV patient revealed marginal statistical significant differences within the two groups, but no statistical significance between the pre-post HIV group with and without experience. Paired *t* tests showed statistical significance for two of the 10 items on the General Self Efficacy Scale (GSES). Marginal statistical significance was noted for one item on the GSES after the intervention. After the simulation, students' mean average for the self-efficacy levels for several scale items was higher than before the simulation. Results concluded that utilizing HFS as a teaching strategy does increase student self-efficacy levels in caring for HIV positive patients.

CHAPTER I: INTRODUCTION

Nursing programs face the challenge of educating nurses who are prepared to work in fast-paced, evolving health care systems. Nurses are expected to care for a variety of complex patients and make split-second decisions that require precise knowledge and clinical judgment skills (Ashcraft et al., 2013). Nursing student self-efficacy has been closely linked with clinical judgment and nursing student success within the clinical setting (Bambini, Washburn, & Perkins, 2009). Self-efficacy directly influences the attrition rate of nursing students (Peterson-Graziose, Bryer, & Nikolaidous, 2013). Other research has found that nursing student self-efficacy levels influence their ability to perform skills in the clinical and lab settings (Karabacak, Servest, Onturk, Aslan, & Olgun, 2013). Nurse educators are faced with the task of ensuring that following graduation; students are able to meet workforce demands. High-fidelity simulation (HFS) is one teaching method that research has shown increases nursing students' self-efficacy and clinical judgment (Leigh, 2008; Blum, Borglund, & Parcells, 2010).

Background

In current healthcare systems, nursing students are expected to learn to care for a variety of types of patients with complex medical needs. The fast-changing health care environment and complex patient needs require nurses to have strong clinical judgment skills that enable them to solve complex clinical problems quickly. Clinical judgment has been integrated into Bachelor of Science in Nursing (BSN) curriculums through multiple measures (Blum et al., 2010; Lindsey & Jenkins, 2013). Multiple teaching strategies in nursing education have been implemented to increase clinical judgment and test student knowledge including HFS and National Council Licensure Examination (NCLEX) style multiple choice exam questions.

NCLEX style questions are written to test students' ability to apply concepts to clinically oriented situations and their nursing knowledge throughout program curriculums (Morrison & Walsh-Free, 2001). NCLEX style questions are designed to test nursing students' ability to apply multiple concepts of nursing to clinical-oriented patient situations that require critical thinking (Morrison & Walsh-Free, 2001). Development of NCLEX style questions follow Bloom's Taxonomy and should be constructed at an application level or higher to measure nursing students' knowledge beyond simple recall (Morrison & Walsh-Free, 2001). This degree of testing requires nursing students to utilize critical thinking to answer these types of questions correctly, demonstrating content mastery and the ability to apply nursing knowledge to clinical situations to make safe patient decisions.

Nursing students are also required to develop strong self-efficacy and vast knowledge to safely provide patient care (Karabacak, Serbest, Onturk, Aslan, & Olgun, 2013; Leigh, 2008; Peterson-Graziose, Bryer, & Nikolaidous, 2013). Student levels of self-efficacy have been found to influence performance in the lab and clinical settings and are closely linked to nursing students' psychomotor skill performances (Karabacak, et al., 2013). Students with high levels of self-efficacy have been found to perform more efficiently in the lab and clinical settings. This level of self-efficacy positively influences student clinical performance outcomes associated with their nursing education (Bambini et al., 2009).

One type of complex patient that nursing students will care for includes patients with human immunodeficiency virus (HIV). HIV is a disease that requires students to be knowledgeable about the disease pathophysiology, transmission of the disease, and nursing treatment needed to care for patients with the disease. Nursing students lack self-efficacy and knowledge regarding providing care for this type of patient (Earl, 2010). According to Diesel, Ercole, and Taliaferro

(2013) students lack knowledge and have misconceptions regarding treating HIV positive patients. When nursing students are faced with caring for HIV positive patients they often are scared, as well as unsure of modes of transmission, and how to treat the patient. This lack of knowledge and self-efficacy may result in poor patient care (Diesel et al., 2013). HFS may be used as a teaching method to increase nursing students' knowledge and self-efficacy regarding treating patients with HIV.

HFS has been used frequently as a teaching strategy in nursing education and is commonly used in nursing schools across the country (Jeffries & Rogers, 2007). HFS allows faculty members to replicate complex medical scenarios, without harming actual patients (Mc Caughey & Traynor, 2010). Students are provided with a safe environment for learning when participating in HFS. Simulated patients allow students to perform physical assessments and work through complex medical scenarios that vary according to students' decision making (Mc Caughey & Traynor, 2010). In addition, HFS allows students to perform many nursing roles and skills without harming patients or making consequential errors (Jefferies & Rogers, 2007).

HFS enhances nursing education in a multitude of ways. Studies have shown an increase in nursing students' self-efficacy with the use of HFS as a teaching tool (Leigh, 2008). Integrating HFS into nursing curriculum can also increase students' clinical judgment abilities (Blum et al., 2010). Research has shown that utilizing HFS, as a teaching method, increases students' abilities to make sound decisions and solve complex patient problems. Organized and structured HFS can increase nursing students' knowledge and self-efficacy (Ashcraft et al., 2013). HFS can be used as a teaching method to increase student knowledge, positive attitudes, and self-efficacy toward treating patients with HIV.

Problem Statement

Research suggests that nursing students often lack the necessary skills and education to care for patients with HIV (Diesel et al., 2013; Lui, Sarangapany, Begley, Coote, & Kishore, 2014). Nursing students have misconceptions and lack confidence towards caring for HIV positive patients (Earl, 2010). There is a lack of research regarding HFS as a teaching tool to increase nursing students' knowledge and self-efficacy in caring for HIV positive patients. Further insight into whether HFS is an effective teaching tool for caring for HIV patients was explored.

Purpose of Study

The purpose of this quasi-experimental quantitative research study was to identify if using HFS as a nursing education teaching strategy improved senior level nursing students' knowledge of HIV and their self-efficacy at a small, private Midwestern university. There were strong implications that using HFS as a teaching strategy increases nursing students' knowledge and self-efficacy (Leigh, 2008; Mc Caughey, & Traynor, 2010; Blum et al., 2010). However, no research had been conducted showing that HFS is effective in improving students' knowledge and self-efficacy regarding HIV.

Nature of the Study

Quantitative research designs provide a method for testing objective theories that examine associations between variables that are measurable with numerical data and analyzed with statistical procedures (Creswell, 2014). Quasi-experimental studies utilize participants who are not randomly assigned but are naturally formed groups of convenience (Creswell, 2014). Pretest and posttest design can assess if two groups of participants are similar in terms of the dependent variable under investigation (Leedy & Ormrond, 2013). Using quasi-experimental quantitative research as an approach to investigate using HFS as a teaching tool was logical and provided

insight into answering specific research questions regarding students' knowledge and self-efficacy in treating simulated patients with HIV. The research method measured if nursing students' knowledge of HIV and self-efficacy was impacted by the simulation intervention. This design method was appropriate because quantitative research uses methods of deductive reasoning to generate predictions that are tested in the real world, moving in an orderly and sequential fashion from a defined problem, with research focusing on problem solving (Polit & Beck, 2017). Quasi-experimental quantitative research was appropriate for this study to perform a comparison of several factors affecting nursing students' learning. Quantitative research follows a sequence that allows for multiple variables to be compared using nominal, ordinal, interval, and ratio data via scales; whereas surveys seek solutions to the problem identified (Leedy & Ormrod, 2013). A unique understanding and comparison of data before and after a specific HFS has been implemented to provide valuable knowledge to nursing educators.

Significance of Study

This study provided a further understanding as to how using HFS as a teaching strategy influences students' learning. Further knowledge was gained regarding HFS influence on students' knowledge and self-efficacy in relationship to HIV. This study provided further information as to why it is important to integrate HFS into nursing curriculums. Results allowed nursing educators to have insight into the use of HFS as an effective teaching strategy for Bachelor of Science in Nursing (BSN) students. If nursing education does not continue to advance as technology advances, students will not be prepared to care for patients with complex medical conditions utilizing technology in the health care settings.

Research Questions

To sufficiently study the effects of HFS as a teaching tool in relation to nursing students' knowledge and self-efficacy related to treating patients with HIV, the following questions were investigated:

1. What is the impact of HFS on BSN students' ability to answer knowledge based NCLEX style questions regarding HIV?
2. What is the impact of HFS as a teaching strategy on BSN students' self-efficacy levels when caring for a simulated HIV positive patient as measured by the General Self-Efficacy Scale (GSES)?

The intent of the research questions was to explore if HFS is an effective teaching method in increasing nursing students' knowledge and self-efficacy regarding HIV.

Definition of Terms

These terms were defined for the purpose of this research study:

Bachelor of Science in nursing (BSN) student. Students who are enrolled in Baccalaureate degree nursing programs (Berman & Snyder, 2012). For the purpose of this research, students were in their senior level of a BSN program.

Experiential learning. The process in which knowledge is created through the transformation of experience where the learner experiences, reflects, thinks, and acts (Kolb & Kolb, 2005).

High Fidelity Simulation (HFS). "Simulation is defined as an attempt to replicate some or nearly all the essential aspects of a clinical situation so that the situation may be more readily understood and managed for real in practice" (Morton, 1995, p. 76). HFS is the highest degree in which simulation approaches reality and will be utilized in this research study.

Human immunodeficiency virus (HIV). "A retrovirus of the subfamily lentivirus that causes acquired immune deficiency syndrome (AIDS). The most common type of HIV is HIV-1, identified in 1984" (*Taber's Cyclopedic Medical Dictionary,* 2001, p. 965).

Knowledge. **"**Information, understanding, or skill that you get from experience or education" (*Merriam-Webster Online Dictionary,* 2016, para. 1). Knowledge has been further defined based in nursing education as "Pattern recognition which may be probabilistically rather than predictive" (Sweeney, 1994, p. 919). Personal knowledge in reference to nursing is defined as knowledge of self and others through personal experience rather than preconceived categories (Sweeney, 1994).

National Council Licensure Examination (NCLEX) style multiple-choice questions. Research developed multiple choice questions were utilized to test students' knowledge of HIV pre-and post-intervention. Criteria for multiple choice questions should include: rationale for each item, items at application or above cognitive level, and require multi-logical thinking and discrimination to answer questions (Morrison & Walsh-Free, 2001).

Quantitative research. Is defined as "looking at amounts, or qualities, of one or more variables of interest; researchers typically try to measure variables in some numerical way in the physical world" (Leedy & Ormrod, 2013, p. 95).

Self-efficacy. "Students' beliefs in their abilities to regulate their own learning and to master academic activities determine their aspiration, level of motivation, and academic accomplishments" (Bandura, 1993, p. 117). The General Self-Efficacy scale will be used in this research study to measure nursing students' levels of self-efficacy.

General Self-Efficacy Scale (GSES). The scale is designed to assess a general sense of perceived self-efficacy with the aim in mind of coping with daily hassles and adaption with stressful situations (Schwarzer & Jerusalem, 1995).

Assumptions

During this research study, it was assumed that participants answered questions honestly to ensure that data is accurate. All completed tools and test results were completed anonymously and kept in a locked filing cabinet in the researcher's academic office to ensure confidentiality. The small, private Midwestern University was not negatively affected by the study. The researcher of this study assumed that information collected from the study could be generalized to the population of BSN nursing students. It was assumed that the student participants would have basic to moderate nursing knowledge and skill levels. In addition, it was assumed that participants were seeking Bachelor of Science in nursing degrees for advancement into areas of nursing which require clinical competence.

Scope

The American Association of Colleges of Nursing (AACN) reported that there are currently over 674 BSN programs in the United States (Amos, 2014). In the state of Nebraska there are 16 accredited BSN programs, with 6 BSN programs in Omaha, NE ("Educationnews.org", 2014). In 2010, there were approximately 145,893 nursing students enrolled in BSN programs across the nation ("Educationnews.org", 2014). The researcher invited 50 BSN students from one accredited BSN program to participate in the study. Each student from the senior level multisystem nursing course was asked to participate in the study.

Limitations

Several limitations arose after completion of this quantitative research study. The study was limited to senior level BSN students enrolled in an advanced multisystem nursing course, who agreed to participate in the study. One limitation of the study was that it only focused on nursing students from a senior course level, and did not obtain the perspective of students from beginning and intermediate levels. Another limitation of the study was that it only looked at Baccalaureate degree nursing students, and did not include students from other pre-licensure programs.

One limitation of the study was that the researcher could not control what actions the students took during the simulation, causing variation between the HFS. Another limitation of the study was that the study was not generalizable, as participants included only those from one school of nursing in the Midwest. Finally, this study looked at self-efficacy and knowledge from a students' individual perception, limiting the perspective from other people such as patients, fellow students, and clinical instructors. To address these limitations, future research may need to be done post HFS in clinical settings. Future research could include the perceptions from managers or lead nurses' regarding recent graduates' efficacy levels and clinical judgment.

Delimitations

One delimitation of the study is the investigator only used participants enrolled in their final semester of their BSN program at a small, private Midwestern University. It is understood that the findings were limited to the experiences the participant had at this single university after this single HFS experience. Self-efficacy and HIV knowledge were measured based on the knowledge and experience students gained through only one HFS experience at this single

university. Future research could look at students' perceptions after a series of HFS experiences across the entire nursing program.

Summary

Chapter one has included discussion on the background, problem, purpose, significance of the study, and the nature of the study. Additionally, the chapter included the research questions, detailed term definitions, assumptions, scope, limitations, and delimitations. The purpose of this quantitative study was to identify if using HFS as a teaching strategy in nursing education improves students' theory course knowledge and self-efficacy related to HIV. Using HFS as a teaching tool has been found to increase nursing students' clinical judgment and self-efficacy (Karabacak et al., 2013; Leigh, 2008; Perry, 2011; Thomas & Mackey, 2012). The study was significant to nursing faculty to determine if using HFS as a teaching strategy is effective for increasing student knowledge and self-efficacy is regarding HIV positive patients. Chapter two will include a review of literature over HIV student knowledge, clinical judgment, and self-efficacy. The literature review will also include HFS design and teaching strategies in nursing education.

CHAPTER II: REVIEW OF LITERATURE

The purpose of this literature review was to further define clinical judgment and self-efficacy in regard to using simulation as a teaching tool. Furthermore, how simulation impacted nursing students' knowledge and self-efficacy regarding caring for HIV positive patients was explored. Bandura's (1977) social cognitive theory provides a theoretical framework and a clear definition of self-efficacy that can be related to nursing students' self-efficacy and simulation. Current research regarding simulation and self-efficacy has been explored to determine how using simulation as a teaching tool in nursing education impacts student self-efficacy regarding their clinical knowledge and judgment. The purpose of this research study was to identify if using HFS as a teaching strategy improved senior level nursing students' knowledge and self-efficacy when treating patients with HIV. Research regarding student knowledge of HIV was also investigated. Limited research regarding the use of simulation to educate nursing students in the care of HIV positive patients exists, thereby strengthening the necessity of this research study.

Nursing Knowledge

Nursing knowledge was grounded in a holistic approach of health and healing with nurses beginning to write from the late 1800s and 1950s (Chinn & Kramer, 2008). The writings were based on all aspects of knowing, without even recognizing that nursing knowledge was being founded (Chinn & Kramer, 2008). These aspects mainly focused on the importance of observation and recognizing facts, a sense of virtue for caring for the sick, and what is needed to make a good nurse (Chinn & Kramer, 2008). Nursing knowledge continued to change and develop over time. "As the 21st century approached, nurses gave serious attention to holistic approaches in practice and to knowledge and development of methods for all patterns of

knowing" (Chinn & Kramer, 2008, p. 29). Today, nursing knowledge continues to evolve and change as practice improves.

In the late 1960s efforts were made to expand knowledge appropriate for nursing to advance nursing in the science community (Rodgers, 2005). Key emphasis in this era by nursing researchers was placed on the development of theories in nursing. These nursing theories were created to ensure that nursing content had a theoretical foundation based on nursing (Rodgers, 2005). This was key to ensure that nursing researchers focused on developing nursing theories versus adding to other disciplines. "The theory movement in nursing marked the beginning of an enduring focus in nursing on articulating and developing the knowledge base of the discipline" (Rodgers, 2005, p. 10). Nursing theories that were created set the foundation for the development of nursing knowledge that we use in nursing education today.

Nursing students begin to develop their foundational knowledge early on in their nursing program and this knowledge continues to expand as they progress through their educational program. Knowledge has many definitions depending on its context. Knowledge has been defined as "pattern recognition, which may be probabilistically rather exactly predictive" (Sweeney, 1994, p. 919). In nursing, knowledge has been broken down into multiple types of knowledge including empirical knowledge, personal knowledge, ethical knowledge, and aesthetic knowledge (Berman & Snyder, 2012). According to Sweeney (1994), personal knowledge focuses on new pattern handling based on one's own personal perception. The development of personal knowledge includes environmental interaction with others, intuition, comprehension, and personal judgment (Sweeney, 1994). Knowledge cannot be processed without it becoming personal to the student and subjective information becomes personal (Sweeney, 1994). Nursing students develop personal knowledge through their study of nursing

theory and interaction with others in clinical and simulation. As nursing students' personal knowledge develops, their self-efficacy increases.

Personal Nursing Knowledge

Chinn and Kramer's theory of personal nursing knowledge

According to Chinn and Kramer's (2008) *Model of the Development of Personal Knowledge*, the following two questions must be asked for development to occur "Do I know what I do?" and "Do I do what I know?" (p. 133). The model includes eight key components: scientific competence, ethical comportment, opening, therapeutic use of self, transformative art/acts, stories, genuine self, and response reflection (Chinn & Kramer, 2008). The component of 'opening' allows students to develop self through reflection and personal stories (Chinn & Kramer, 2008). For students to develop personal knowledge they must have strong scientific and moral competence (Chinn & Kramer, 2008). This model provides a clear depiction of how personal knowledge develops based on student experiences, reflection, and competence.

Part of the development of personal knowledge is personal knowing. Moch (1990) defined 'personal knowing' as finding self-and-others through reflection, perceptions, and connections to what one knows. Moch's (1990) *Theory of Personal Knowing* consists of three parts that are interconnected: experiential knowing, interpersonal knowing, and intuitive knowing. Understanding and knowledge that comes from life experience and a connection with others is referred to as experiential knowing (Moch, 1990). Intuitive knowledge is knowing without having a conscious use of reasoning (Moch, 1990). Personal knowing leads to the development of nursing students' nursing knowledge. Nursing students utilize nursing knowledge to provide safe care to patients.

Roger's theory of learning

Rogers' (1969) *Theory of Learning* provides a clear foundation as to how personal knowledge is integrated into a curriculum via the goals set forth by the educator. Goals of the teacher include providing the essential knowledge of the past and future that are needed for the development of personal knowledge (Rogers, 1969). Part of this theory is students' learning styles and each student's unique capacity for knowledge (Rogers, 1969). Furthermore, Rogers (1969) proposed that each student learns differently and will use the knowledge obtained from interaction with others as a basis for forming their individual personal knowledge. The change process of gaining personal knowledge is unique and not always predictable (Rogers, 1969). Nursing students' personal knowledge is cohesive with their nursing knowledge; they build upon each other as they gain experiences. Part of this personal knowledge includes the development of clinical judgment.

Clinical Judgment

Clinical judgment is a necessity for new graduate nurses to be successful when entering the work force (Alfaro-LeFevre, 2009). Research related to clinical judgment in nursing dates back as early as the 1960's. Thompson, Aitken, Doran, and Dowding (2013) found that a nurse's judgment and decision making has the possibility to improve healthcare and decrease errors and adverse events. However, little evidence exists regarding technology and the development of teaching methods regarding improving clinical judgment. Nurses are faced with complex patient problems daily and must make educated judgment decisions while multitasking and with limited time. Nurses are significant decision makers and it's estimated that 19 million nurses will make clinical judgment decisions worldwide on behalf of their patients (Thompson et al., 2013). Nursing students' clinical judgment is an area that needs to be further explored.

Theories of Clinical Judgment

Tanner's theory of clinical judgment

Several theories of clinical judgment have been identified throughout research. One widely published theory is Tanner's *Theory of Clinical Judgment* (2006), which defined clinical judgment as being interchangeable with problem solving, decision making, and critical thinking. This theory clearly defines clinical judgment as an "interpretation or conclusion about patients' needs, concerns, or health problems, or the decisions to act, use or deem appropriate by the patient's response" (Tanner, 2006, p. 204). Other key components of the theory include what the nurse brings to the situation, degree of knowledge regarding the patient, the context of patient situation, and reflection on practice (Tanner, 2006). Tanner's (2006) *Clinical Judgment Theory* included: noticing, interpreting, responding, and reflecting as components of clinical thinking. Tanner's model provides a clear interpretation and definition of clinical judgment that helps further understand its significance to nursing.

Lasater's theory of clinical judgment

Lasater's (2007) *Clinical Judgment Rubric* integrates Tanner's *Clinical Judgment Theory* (2006) and includes noticing, interpreting, responding and reflecting. The rubric is a tool used to assess nursing students' perceptions of clinical judgment. The tool has a total of 11 dimensions in four phases, which includes exemplary, accomplished, developing, and beginning (Lasater, 2007). The 11 dimensions covered by the Lasater (2007) *Clinical Judgment Rubric* include: observation, pattern recognition, seeking information, prioritizing, skillfulness, confidence, communication, flexibility, self-analysis, and improvement. Essentially, scoring high in all the dimensions is equivalent to having clinical judgment skills. With the rubric, students are asked to evaluate the dimensions by selecting letters with the four phases discussed earlier. Results

will correlate if a nursing student feels they are exemplary through beginner in the identified dimensions within the Lasater's (2007) *Clinical Judgment Rubric*. Exemplary means that they feel they have achieved the highest level of clinical judgment, with beginner being the most novice level. This tool provides a sound method of evaluating nursing students' clinical judgment and can be used before or after a teaching intervention. Lasater's (2007) *Clinical Judgment Rubric* will not be utilized in this study.

Benner's theory from novice to expert

Benner's (1982*)* theory *From Novice to Expert* encompasses clinical judgment for nurses. Benner utilized the Dreyfus model from novice being the beginner to expert being the competent nurse (Benner, 1982). According to Benner (1982), during the expert phase, nurses can solve problems based on knowledge and experience not just the analytical principles. When a nurse reaches the expert level they can use clinical judgment to solve complex patient problems. For the expert nurse to have clinical judgment they must utilize everyday knowledge of their patients to make decisions and situated thinking (Benner, Tanner, & Chesla, 2009). Part of clinical judgment also includes taking steps of action quickly in clinical situations (Benner et al., 2009). For nurses to develop clinical judgment they must reach the level of expert and have strong patient clinical knowledge.

Alfaro-LeFevre's theory of clinical judgment

Clinical judgment has multiple published definitions and theories that contribute to many research studies regarding nursing education. Alfaro-LeFevre's (2009) *Clinical Judgment Theory* supports this research study's purpose and design, providing a foundation for the study. Clinical judgment is defined as "nursing decisions made about a person's, families, or group's health at a certain point in time; decisions made about things like what to assess, what to do first,

and who should do it" (Alfaro-LeFevre, 2009, p. 288). Clinical judgment is the result of a process, or the end point the nurse comes to when making a decision (Alfaro-LeFevre, 2009). Several strategies for students that are developing clinical judgment are noted in Alfaro-Lefebvre's (2009) Clinical Judgment Theory including: utilizing resources and standards for practice, reflection on individual thinking, and following policies and procedures. Other components of the theory include following a systematic approach to making decisions, and knowing why the tasks are being performed (Alfaro-LeFevre, 2009). According to Alfaro-LeFevre (2009), learning from people such as educators, classmates, and other nurses are key components of the clinical judgment strategies (Alfaro-LeFevre, 2009). These basic strategies are essential in nursing students' development of clinical judgment. Another key component of nursing student success is the development of self-efficacy.

Clinical Judgment and Nursing Students

Concept-based learning

Research has focused on multiple teaching strategies to increase nursing students' clinical judgment. One method of teaching to increase clinical judgment in nursing education is utilizing concept maps. Gerdeman, Lux, and Jacko (2012) studied whether using concept maps increased nursing students' clinical judgment. Concept maps are visual diagrams that facilitate new knowledge development through meaningful learning and show a relationship between several topics (Gerdeman et al., 2012). Students utilized a clinical rubric to create concepts maps weekly for 6 weeks. At the end of the 6 weeks they completed the *Clinical Judgment Self-Evaluation* (Gerdeman et al., 2012). Results indicated that students felt that the concept mapping provided guidance in the development of clinical judgment and helped them identify relevant

information pertaining to clinical situations (Gerdeman et al., 2012). Utilizing concept mapping as a teaching strategy can enhance nursing students' perceived level of clinical judgment.

Lasater and Nielsen (2009) measured the effects of concept-based learning activities on the development of clinical judgment in baccalaureate nursing students. Concept-based learning activities utilized a study guide focusing on one nursing concept related to pediatrics and maternal-child. The study guide followed Tanner's (2016) Clinical Judgment Model (Lasater & Nielsen, 2009). These study guides were completed prior to clinical, during clinical, and after clinical. The *Lasater Clinical Judgment Rubric* was utilized to evaluate a simulation before and after the concept-based learning activities (Lasater & Nielsen, 2009). Results indicated that meaningful learning and expanded students' clinical experiences may be related to students' development of clinical judgment (Lasater & Nielsen, 2009). Concept-based learning is directly correlated with the improvement of nursing students' clinical judgment.

Role modeling and clinical judgment

Other research has focused on using simulation and role modeling to increase clinical judgment in caring for geriatric patients. Johnson et al. (2012) utilized a control and treatment group to complete a three-phase geriatric unfolding case after being exposed to an expert role model. The case study was conducted with high-fidelity simulation mannequin. The team leaders in the scenarios were evaluated using the *Lasater Clinical Judgment Rubric.* The results indicated that utilizing the expert role-modeling did have a significant impact on the development of clinical judgment in caring for older patients (Johnson et al., 2012). The research adds to the literature that clinical judgment can be enhanced using expert role-modeling and can be assessed by utilizing HFS.

Multiple theories of clinical judgment have been explored to help further define clinical judgment in relationship to education (Tanner, 2006; Lasater, 2007; Benner 1982; Alfaro-LeFevre, 2009). These theories help lay the foundation of clinical judgment and its importance to baccalaureate nursing education. Several teaching methods have been shown to improve nursing students' clinical judgment. Concept-based learning is one approach that improves clinical judgment (Gerdeman et al., 2012; Lasater & Nielsen, 2009). Expert role-modeling with the use of simulation is another teaching method that has been proven to improve nursing students' clinical judgment (Johnson et al., 2012). Further research is needed regarding teaching strategies and enhancing clinical judgment.

Bandura's Social Cognitive Theory

In 1977 Albert Bandura first described self-efficacy in his *Social Cognitive Theory*. The *Social Cognitive Theory* provides a clear definition of self-efficacy as people's beliefs about their capabilities to produce certain levels of performance that influence events that affect their lives, affecting how they think, feel, and motivate themselves (Bandura, 1994). People who doubt their capabilities avoid difficult tasks that they perceive as a threat (Bandura, 1994). The *Social Cognitive Theory* states that self-efficacy affects the cognitive, motivational, affective, and selection processes (Bandura, 1994). For people to be successful they must have strong self-efficacy or they will have self-doubt and fail to set high goals for themselves. Self-efficacy perceptions are derived from performance attainment (Bandura, 1994). Young adulthood is a time when people learn to cope, develop lasting relationships, marital relationships, parenthood, and occupational careers (Bandura, 1994). Those who have a low self-efficacy are not able to do so and are vulnerable to stress and depression (Bandura, 1994). Students who have a low self-

efficacy are not able to cope and are at greater risk of not being able to deal with the stressors of nursing school (Leigh, 2008).

Bandura (1993) described three different levels at which perceived self-efficacy contributes to academic success, mastery of academic activities, level of motivation, and academic accomplishments. Student's beliefs in their efficacy determine those aspirations. Bandura's (1993) social cognitive theory states that self-efficacy is closely linked to cognitive motivation, meaning that people who have high self-efficacy attribute their failures to insufficient effort. The theory further explains that self-efficacy beliefs contribute to motivation by determining the goals people set for themselves, how much effort they extend, how long they persevere in difficult situations, and their resilience to failures (Bandura, 1993). Self-efficacy is directly linked to students' goal setting and success in nursing school.

Mastery of academic activities

Bandura's first level of perceived self-efficacy is mastery of academic activities, which primarily occurs at school beginning at a young age (Bandura, 1993). School provides students with the opportunity for the development of cognitive skills that rest on their talents and the self-efficacy of the teachers (Bandura, 1993). Teachers with a high level of self-efficacy about their teaching abilities can motivate students to develop their cognitive abilities. Students who can master academic activities are able to develop self-appraisal and high levels of self-efficacy (Bandura, 1993). Classroom structure and teaching strategies used by teachers with high levels of self-efficacy can foster this growth. As children master their cognitive skills their intellectual efficacy develops. For students to develop self-efficacy they must master academic activities provided in an environment that fosters the growth of self-efficacy.

Level of motivation

The next level of Bandura's (1993) social cognitive theory is level of motivation. Self-beliefs of efficacy play an important role in the regulation of motivation (Bandura, 1993). Students form their individual beliefs on what they can do by setting goals and anticipating outcomes (Bandura, 1993). Motivation is controlled by the expectation that a behavior will produce a certain outcome and what the value of the outcome means to the student. Students act on their beliefs regarding what they can and cannot do; their individual motivation influences this (Bandura, 1993). For student self-efficacy to develop, students must be motivated and must have mastered academic achievements in the past. Students build upon their academic achievements and their motivational levels increase.

Academic accomplishments

The final level for Bandura's (1993) social cognitive theory is academic accomplishments. Students strive to obtain goals or level of competence and receive feedback from time to time regarding their performance (Bandura, 1993). Their desired accomplishments are reached and progression of these accomplishments can strongly impact their self-efficacy (Bandura, 1993). Performance feedback directly impacts the development of self-efficacy. If feedback is negative, it can decrease self-efficacy, while if positive it can be enhanced (Bandura, 1993). So, students who achieve academic accomplishments, whether it be winning the spelling bee or getting an A on a project, will have a high level of self-efficacy that will impact their future accomplishments. Students who do poorly and receive negative feedback will continue to have deteriorating performances.

Bandura's (1993) three levels of self-efficacy, mastery of academics, level of motivation and academic accomplishment all impact the development of student self-efficacy. This

development begins at a young age and is carried on into college settings. Student self-efficacy directly impacts student academic performance (Bandura, 1994). For students to be successful they must maintain a high level of self-efficacy. The classroom environment can enhance or hinder this development of self-efficacy.

Self-Efficacy

Self-esteem and self-efficacy have similarities, but are not the same. Self-esteem is defined as "confidence and satisfaction in one self" (*Merriam-Webster Online Dictionary*, 2016, para. 1). Self-esteem focuses more on students' beliefs or perceptions in their own abilities and worth (Unal, 2012). The difference between self-efficacy and self-esteem is that self-esteem is their perception of their own self and self-efficacy is their actual abilities to accomplish their goals. Self-efficacy is directed at students' abilities to achieve and accomplish their goals, and master their academic activities. Bandura's (1993) social cognitive theory provides a clear definition of self-efficacy and how it develops which is very applicable to college students. Prior to starting, college students have either developed a high level of self-efficacy or are still working to improve their self-efficacy. Bandura's definition of self-efficacy, which includes academic activities, high levels of motivation and academic achievements directly apply to nursing students. Teaching strategies must be tailored to providing learning opportunities that foster the growth of self-efficacy.

Wang and Castaneda-Sound (2008) explored generational status, self-esteem, academic self-efficacy, and social support of college students. The study utilized multiple survey tools including: Rosenberg Self-Esteem Scale, College Self-Efficacy Inventory, Social support appraisals, and the Stress subscale of Rhode Island Stress and Coping Inventory to study 365 students from a large university on the west coast (Wang & Casteneda-Sound, 2008). The study

looked closely at the differences between first generational college students and non-first generational college students. Results indicated that self-esteem, academic self-efficacy, and social support were significantly associated with first generational college students' wellbeing (Wang & Casteneda-Sound, 2008). In addition, Wang and Casteneda-Sound (2008) found that students with higher perceived self-efficacy have greater life satisfaction. Results indicate that self-efficacy impacts students' wellbeing and life satisfaction, which impact their success and perseverance in higher education (Wang & Castenda-Sound, 2008). For students to be successful they must have a strong sense of wellbeing, and it's important for them to be satisfied with their life overall.

Self-efficacy and nursing students

Nursing students are exposed to large amounts of new knowledge and nursing skills throughout their education. Their individual learning styles and personality traits affect their performance during their educational programs. These traits include individual student self-efficacy. Self-efficacy is defined as individual beliefs in one's own individual capabilities to perform actions needed to achieve a goal (Karabacak, Serbest, Onturk, Aslan, & Olgun, 2013; Leigh, 2008). Self-efficacy impacts how a nursing student performs within the clinical setting. Students' ability to learn new skills and knowledge is affected by the students' level of self-efficacy (Leigh, 2008). Nursing faculty members witness self-efficacy levels affecting student performance during clinical and laboratory settings.

Other researchers have focused on the relationships between self-efficacy, life stressors and nursing student attrition (Peterson-Graziose, Bryer, & Nikolaidous, 2013). Since nursing programs tend to have high attrition rates, the researchers were trying to determine if self-efficacy plays a role in whether nursing students stay in programs. Results indicated that self-

esteem had a direct correlation to attrition in nursing programs (Peterson-Graziose et al.). In this study, self-efficacy and life stressors did not impact attrition. Results also indicated self-efficacy was positively related to student self-esteem (Peterson-Graziose et al.). Results indicate that high levels of self-esteem are closely linked to high levels of self-efficacy.

Self-efficacy and psychomotor skill development. Self-efficacy has been researched in regard to nursing students' psychomotor skills. Karabacak, et al. (2013) researched general self-efficacy levels of students studying for undergraduate degrees in nursing and examined the relationship between skill development and self-efficacy. Karabacak et al. (2013) found that students with a high level of self-efficacy performed well with acquiring knowledge, skills, and attitudes regarding cognitive, affective, and psychomotor fields. Students with a higher level of self-efficacy encountering difficult situations exert greater effort and persist longer than those with lower self-efficacy (Karabacak et al., 2013). Results support the theory that students who have a higher level of self-efficacy perform better in skill settings during nursing school.

Student self-efficacy levels impact not only their success in college but also wellbeing, life satisfaction, and ability to cope with stressors (Peterson-Graziose et al., 2013; Wang & Casteneda-Sound, 2008; Leigh, 2008). Self-efficacy directly influences nursing students' ability to perform skills in the clinical and lab settings (Karabacak et al., 2013; Peterson-Graziose et al., 2013). All of these factors influence how students perform at the college level and their success academically and socially. Research leads us to believe that college students with high levels of self-efficacy perform at higher levels and enjoy college.

Simulation

Simulation has greatly increased over the last 15 years in nursing education. Computer based simulation was first used in industrial settings such as military and aviation (Wilford &

Doyle, 2006). Simulation was first used in nursing education in the 1950's with students learning physical assessment skills on Mrs. Chase, a life-sized prototype mannequin that was built resembling a human being (Peteani, 2004). Later, the Harvey model allowed students to differentiate between normal and abnormal heart and lung sounds (Peteani, 2004). The first fully computer based simulation mannequin, Sim-One, was developed in 1969 and utilized mainly by anesthetists to learn endotracheal intubation (Peteani, 2004). Simulators have advanced to the mannequins that utilize computer software, evolving into high-fidelity mannequins that mimic all bodily functions and are close to real-life patients (Peteani, 2004). To date, high-fidelity simulators such as Laerdal Sim-Man are the most advanced methods of simulation and are used frequently in many nursing programs across the United States.

Jeffries (2005) defined simulation as activities that mimic the reality of clinical environments 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. Simulation provides students with valuable learning experiences that create a safe learning environment causing no harm to actual patients. Simulation experiences are often video recorded and watched back during debriefing, allowing time for discussion and further learning to occur (Larew, Lessans, Spunt, Foster, & Covington, 2006). Afterwards, during the debriefing process, students receive feedback and discuss what went well and what could be improved upon.

High-fidelity simulation in nursing

High-fidelity simulation mannequins are commonly used in nursing schools across the country. Full-scale simulators within the healthcare context combine life-like, anatomically correct mannequins with computer programs, permitting complex physiological and

pharmacological responses such as respiratory and cardiovascular functions (McCaughey & Traynor, 2010). Simulation allows us to replicate real-life hospital scenarios within the laboratory setting. These patients allow students to perform physical assessments and work through complex medical scenarios that vary according to the student's decision-making (Mc Caughey & Traynor, 2010). Some scenarios allow students to encounter situations they may not see in the clinical setting.

Nursing faculty members are presented with the challenge of finding appropriate clinical sites for student nurses due to the increased need for nurses (Meyer et al., 2014). While simulation will never completely replace the actual hospital setting, it does provide additional clinical opportunities to compliment the clinical setting. Educators are also faced with the challenge of providing safe opportunities for students to practice nursing skills and effective management skills in rapidly changing clinical situations (Larew et al., 2006). Simulation provides students with a positive learning environment to perfect their management skills and work with multidisciplinary members to address common patient problems (Larew et al., 2006). Simulation creates a clinical setting for performance of nursing skills and safe learning to occur.

Simulation model

Pamela Jeffries (2005) created a simulation framework to guide educators in designing, implementing, and evaluating simulation in nursing that helps educators create meaningful nursing simulation scenarios. Jefferies and Rogers (2007) define simulation as activities that mimic reality and provide for role-playing, videos, or mannequins that facilitate learning and help nursing students demonstrate decision making and critical thinking. For learning to occur successfully, simulations must be designed properly and utilize appropriate organization (Jeffries, 2005). Five major variables were identified by Jeffries & Rogers (2007) including:

teacher role, student role, educational practices, design characteristics and simulation and outcomes. These variables will be further discussed and how they relate to the use of simulation will be explained.

Role of teacher and students. To begin with simulation design, we must look at factors that influence students and faculty. Factors that affect faculty include their training with simulation and their role with the simulation, such as whether the simulation will be conducted for learning or evaluation (Jeffries, 2005). Student factors include their roles during the simulation and outcomes they are expected to achieve. Clear expectations of both the role of the teacher and the student must be set forth and followed for effective learning experiences to occur. Roles and expectations during the simulation must be explained clearly and planned accordingly prior to the actual simulation (Jeffries, 2005). The simulation needs to be as realistic as possible for positive learning outcomes to occur. Prior role clarifications will ensure a seamless simulation that is organized and provides a platform for learning.

Educational practices. Jeffries and Rogers' (2007) educational practices in simulation design focus on active learning, diverse learning styles, collaboration, and high expectations. Active learning provides educators with the ability to assess students' problem solving and decision-making within the simulation experience (Jeffries & Rogers, 2007). Simulation encompasses diverse learning styles by incorporating activities that are visual, auditory, tactile, and kinesthetic (Jeffries & Rogers, 2007). Simulation is a teaching strategy that engages students with many different learning styles. Simulation also provides for the development of student-faculty relationships by providing collaboration, and an open atmosphere (Jeffries & Rogers, 2007). Students should feel comfortable asking the faculty member questions before, during, and after the simulation. The final educational practice strategy Jeffries and Rogers

(2007) discuss is high expectations, which should foster goal setting and expansion of competency levels. Students should set high personal goals and faculty should set clear learning expectations.

Simulation design and outcomes. Jeffries and Rogers (2007) outline several components that simulation designs should include: objectives, fidelity, problem solving, student support, and reflective debriefing. Clear objectives must guide the learning that occurs during the simulation (Jeffries & Rogers, 2007). The fidelity, the level in which the simulation mimics reality, should be considered and should meet the learning outcomes and needs of the students (Jeffries & Rogers, 2007). Simulation should have built in patient problems that the students must assess and treat. This should also meet the learning outcomes of the simulation. The final pieces include student support and reflective debriefing

Throughout the simulation, assistance to the students should be provided through cues and programming (Jeffries & Rogers, 2007). These cues should help guide the students towards successfully treating the patient. At the end of the simulation, students should be given opportunities for reflecting and time to assess their actions during the simulation (Jeffries & Rogers, 2007). These components make up a successful simulation experience for the students and faculty. For the simulation to be successful, lots of time and energy must go into designing a simulation that meets the learner's needs.

Regarding simulation design, several areas must be closely noted including: teacher role, student role, educational practices, design characteristics and simulation outcomes (Jeffries & Rogers, 2007). Faculty play an important role to ensure these areas are addressed to create an effective simulation scenario. A framework for simulation experiences helps faculty conduct research in an organized way and maintain consistency (Jefferies & Rogers, 2007). The faculty

member plays the role as the facilitator, but the simulation is student-centered and the student is responsible for his or her own learning (Jefferies & Rogers, 2007). Using the framework allows faculty to be consistent and create an organized simulation experience for students.

Several studies have been based on Jeffries' (2005) simulation framework. Garrett, MacPhee, and Jackson (2010) utilized Jeffries' simulation framework for their study of 30 BSN nursing students to explore the implementation of high-fidelity simulation in a Canadian nursing program. Through the use of Jeffries' simulation framework, researchers were able to set up their simulation to include reading, web based activities, and several simulations including critical situations students encounter (Garrett et al., 2010). The researchers concluded that students found the real-time patient status changes in the simulation to be valuable and the clear learning outcomes, basic preparation and orientation, and minimal faculty intervention to be a great way to set the simulation up. Students reported that they enjoyed the simulation and found it be a safe learning environment (Garrett et al., 2010). Jeffries' framework provided a plan to develop a simulation that the students found to be organized and beneficial to their learning.

Another study that utilized Jeffries' simulation framework focused on student satisfaction and self-confidence with using high fidelity simulation (Smith & Roehrs, 2009). Smith and Roehrs (2009) researched 68 BSN first year medical-surgical students using the Student Satisfaction and Self-confidence Scale and the Simulation Design Scale following a respiratory distress simulation during the final week of the course. This study showed that using Jeffries' simulation framework is valuable since students reported being satisfied with the simulation and having increased confidence in performing respiratory related nursing skills (Smith & Roehrs, 2009). Students had positive feedback regarding the simulation design showing that integrating Jeffries' simulation framework is valuable to nursing curriculums (Smith & Roehrs, 2009).

Jeffries' simulation framework is valuable in designing effective simulations that students enjoy and find imperative to their learning.

Student roles during simulation

During simulation scenarios, students are placed in a variety of nurse roles such as a charge nurse or new graduate nurse. They are also placed in non-nurse roles such as observer, recorder, family member, or advanced medical practitioners. Students may rotate through a variety of roles; therefore, it is important that ground rules are set and students know the expectations of each role (Jefferies & Rogers, 2007). Each of these roles provides different learning opportunities for student nurses. Research has focused on whether students learn effectively in participation roles versus observational roles (Kaplan, Abraham, & Gary, 2012). Kaplan et al. (2012) randomly placed 92 junior level BSN students in active roles such as bedside assistant, documenter, team lead, and observers. Students were given multiple problem based learning scenarios over several weeks with a 10-item test at the end. The simulation took place using two high-fidelity simulators in a replicated emergency room setting. Results found no significant difference between the observers and students who had an active role (Kaplan et al., 2012). Results indicated that students learn effectively from simulation, even in observational roles. Results indicated that over 70% of the students enjoyed the simulation, found it well-organized, clarified theory content, and increased knowledge (Kaplan et al., 2012). This study supports that simulation is an effective teaching tool no matter what role the student plays during the experience.

Other research has focused on the effectiveness of using HFS with an intraprofessional team approach (Leonard, Shuhairbar, & Chen, 2010). Leonard et al. (2010) researched 48 nursing students 'perceptions after a pediatric respiratory and adult cardiac simulation scenario.

Students were expected to manage the scenario based on their clinical level and clinical competence. Results indicated that intraprofessional nursing teams were valuable learning experiences for both third and fourth year nursing students (Leonard et al., 2010). Students reported that the intraprofessional simulation helped them adjust to a team environment and adapt based on their current educational level (Leonard et al., 2010). Students were able to see differences based on the year of their education and reflect on how their confidence and skills differ from colleagues at different levels in the nursing program. This research supports that using students from multiple levels in one integrated simulation is an effective method of teaching using HFS.

Nurses are expected to take on the role of an educator frequently throughout their practice with areas such as medication administration, wound care, and diabetic teaching etc. Kurtz, Lemley, and Alverson (2010) researched peer teaching with master student presenters using the simulation lab. Students were expected to deliver a presentation, demonstrate a skill using the simulation mannequin, and complete a survey regarding the experience (Kurtz et al., 2010). Students were also graded heavily on professionalism, appropriate language, and their knowledge (Kurtz et al., 2010). The study found that students enjoyed the assignment, reported increased confidence, and further developed their role as a caregiver (Kurtz et al., 2010). Using simulation combined with teaching is an effective teaching strategy that reinforces the role of a nurse as an educator. New graduate hospital nurses are expected to teach patients complex medical information in a quick and proficient manner and this type of simulation supports this.

Simulation has also been utilized as a teaching method to help new graduate nurses adapt to their new role in hospital settings. Young and Burk (2010) focused on Advanced Clinical Education and Simulation (ACES) courses to close the gap between academia and practice for

graduate nurses. Newly registered nurses and pharmacists participated in a 5-week program utilizing simulation and ACES evaluations focusing on critical thinking skills, communication skills, and prioritization (Young & Burke, 2010). Results indicated that the program improved critical thinking, communication, and "hands on" development (Young & Burke, 2010). The program also facilitated the nurse's role while working with interdisciplinary team members encouraging open communication with the pharmacist (Young & Burke, 2010). Overall, the results of the study are consistent with other research that has found that participants learn from using simulation and it helps improve multiple aspects of their role as a nurse. Having multiple roles during the simulation encourages teamwork and development of critical thinking skills.

Nurses are expected to work with health care professionals from a variety of disciplinary teams. Nursing students often struggle with communication with doctors. Dillon, Noble, and Kaplan (2009) focused on using simulation as an educational strategy to analyze the relationship between nursing students and medical students. Results indicated that after the simulation, medical students had a positive attitude towards collaboration and better understanding of the autonomous role of a nurse (Dillon et al., 2009). Both groups of students saw better communication skills and teamwork as an important part of the nurse-physician relationship (Dillon et al., 2009). Simulations with a focus on teamwork between interdisciplinary professionals have positive outcomes such as improved communication skills. These communication skills and teamwork are imperative to delivering safe and competent care.

Simulation and self-efficacy

Studies have shown an increase in nursing student self-efficacy with the use of simulation as a teaching tool (Leigh, 2008). Students report a decrease in stress when going to the clinical setting after simulation (Leigh, 2008). Sohn, Ahn, Lee, Park, and Kang (2013) researched 25

nursing students' self-efficacy after 5 hours of problem-based simulation on hypertension from two different cohorts. Students completed problem based learning simulation sessions, didactic lecture, and care plans following the simulation (Sohn et al., 2013). The researchers concluded that students' self-efficacy in assessment, physical examination, prioritizing nursing care, and health promotion all increased after the simulations (Sohn et al., 2013). These results show that simulation is an effective teaching strategy for increasing nursing students' self-efficacy. Utilizing simulation allows students to gain more confidence in their abilities, which is applicable to actual patient care.

Simulation, self-efficacy and communication skills. Simulation provides students with opportunities to role-play that expand communication skills and hands-on-skills. Other research has focused on nursing students' self-efficacy in communication and physical care of patients. Dunn, Osborne, and Link (2014) examined baccalaureate nursing students' self-efficacy before and after 8 weeks of high-fidelity simulation sessions. Results indicated that students' self-efficacy for patient communication and for physical patient care increased significantly after the simulation experiences (Dunn et al., 2014). Results support that using HFS is a valuable tool for increasing students' self-efficacy for aspects of clinical practice through increasing student confidence in their ability to communicate and care for patients (Dunn et al., 2014). Simulation is a valued teaching method that increases student self-efficacy in caring for patients.

Upon graduation, entry-level nurses need to have excellent communication skills while working with patients, families, and interdisciplinary health care teams. Hsu, Chang, and Hseih (2015) focused on the effects of scenario-based simulation versus traditional theory teaching on nurses' communication, competence, and self-efficacy. The experimental group showed a higher level of satisfaction and increased communication competence compared to the traditional

lecture group (Hsu et al., 2015). Self-efficacy increased for both the control and experimental group but the experimental group was significantly higher (Hsu et al., 2015). This research shows that students gain more knowledge and self-efficacy with simulation compared to traditional lecture. Students also tend to be more satisfied with simulation in comparison to traditional teaching methods.

Simulation, self-efficacy, and clinical skills. Nursing students are expected to perform complex skills such as administering vasopressors to patients with septic shock after graduation. Research has also focused on improving self-efficacy and vasopressor titration with utilizing simulation (Fadale, Tucker, Dungan, & Sabol, 2014). Fadale et al. (2014) focused on using simulation-based learning (SBL) to increase nurses' self-efficacy and clinical performance at three points of time. Results found that simulation significantly increased performance with cardiac care and self-efficacy at all three points of time (Fadale et al., 2014). This study showed that simulation has the potential for improving new nurse orientation and continuing education for advance practice nurses (Fadale et al., 2014). Simulation is effective in improving nursing skills and student self-efficacy.

Simulation, self-efficacy, and knowledge. Other research has focused on using simulation to show a correlation between self-efficacy and knowledge. Shinnick and Woo (2014) utilized a pre-posttest study method with a control group providing nursing students with respiratory simulations and testing their level of self-efficacy and knowledge. Results indicated an increase in knowledge and self-efficacy for the control group between the pretest and posttest (Shinnick & Woo, 2014). This study shows that using simulation as a teaching method is effective in increasing student knowledge and self-efficacy.

Simulation has been found to increase student self-efficacy in a variety of areas. Several areas that have been identified and researched include: student communication skills, nursing skills, and knowledge (Sohn et al., 2013; Dunn et al., 2014; Hsu et al., 2015; Fadale et al., 2014; Shinnick & Woo, 2014). These studies have shown that simulation does in fact increase student self-efficacy and impact student learning in a positive way. Student self-efficacy is imperative to student success during their nursing program. Students must be able to have confidence in their abilities to successfully apply their skills, knowledge, and communication abilities into the actual clinical setting with real patients. Faculty need to continue to research how simulation impacts student self-efficacy.

Simulation as a teaching strategy. Historically, nursing education has consistently utilized traditional lecture as a main method of delivering information to students. As health care technology advances, the expectations of new graduate nurses have, as well. Nursing students need opportunities to develop clinical reasoning, prioritization, and respond to changing patient needs (Meyer et al., 2014). Meyer et al. (2014) focused on new registered nurses' perceptions of simulation during school, how simulation prepared them for practice, and benefits and challenges of simulation. Results indicated that participants found simulation to be highly valuable when instituted at the right time during the program and when it integrated what they were currently learning (Meyer et al., 2014). Students felt they learned from simulations that were realistic and well planned and experienced less anxiety the more prepared they were (Meyer et al., 2014). Students also reported that they liked when faculty were supportive and offered positive and constructive feedback (Meyer et al., 2014). Simulation was found to be an effective teaching method that students enjoyed.

Research has focused on comparing using case-based learning simulation with traditional lecture. Raurell-Torreda, Olivet-Pujol, Romero-Collado, Malagon-Aguilera, Patino-Maso, and Baltasar-Bauge (2014) compared structured clinical examination with simulation to traditional teaching methods and compared students with and without clinical experience. Results indicated that the intervention group had better assessment skills, patient evaluation, and appropriate nursing interventions than the control group (Raurell-Torreda et al., 2014). Case studies, together with simulation, are an optimal method of teaching for preparing students for clinical (Raurell-Torreda et al., 2014). The quality and consistency of clinical experiences is provided through simulation, which is more efficient than just lecture alone.

Simulation and clinical competence. Nursing students are not only expected to exhibit confidence in patient rooms, but they are also expected to demonstrate clinical competence in the skills and tasks they perform during clinical in healthcare settings. Blum, Borglund, and Parcells (2010) developed a study to examine the relationship between simulation, self-confidence, and clinical competence. A comparison of both simulation and traditional laboratory teaching was done utilizing the Lasater Clinical Judgment Rubric (Blum et al., 2010). Results found that both methods were effective in increasing students' self-confidence and clinical judgment (Blum et al., 2010). Results indicated that simulation does in fact work as an effective teaching strategy in improving entry level nursing students' clinical judgment, which is very important in the actual clinical setting.

Debriefing after simulation gives students the opportunity to reflect on the simulation and what they learned during the experience. Students are able to discuss what went well during the simulation and what they could do in the future to improve. Lavoie, Pepin, and Boyer (2013) researched a teaching intervention combining HFS and reflective debriefing. Results indicated

that the experience contributed to nursing students' prioritization, organization, nursing assessment skills, and clinical judgment in the simulation (Lavoie et al., 2013). The reflective debriefing allowed students to gain a deeper insight and analysis of their thinking processes when they encountered difficult situations (Lavoie et al., 2013). Simulation allows students to enhance their nursing skills, while reflective debriefing allows them to further analyze their critical thinking.

Self-efficacy, clinical judgment, and simulation. Further research explored if simulation has a positive correlation with students' self-efficacy and clinical judgment. Bambini, Washburn, and Perkins (2009) explored simulated clinical experiences as a teaching method to increase self-efficacy. Results indicated that students did, in fact, have an increase in self-efficacy after simulated clinical experiences (Bambini et al., 2009). Qualitative results revealed that students felt that communication, confidence, and clinical judgment all increase through simulation experiences (Blum et al., 2009). Advancement of technology has created realistic simulations during which students can demonstrate clinical judgments without endangering patients' lives (Blum et al., 2009). Simulation is an effective teaching strategy that promotes student self-confidence and clinical competence while maintaining patient safety. Simulations allow students to practice in real-life settings, allowing room for errors without jeopardizing actual patient safety.

Simulation and patient teaching. Simulation provides nursing students with learning opportunities such as reinforcing patient teaching and skill repetition. Wagner, Bear, and Sander (2009) researched nursing students' ability of teaching discharge instructions to postpartum moms. Students reported confidence in discharge teaching and satisfaction after simulation (Wagner et al., 2009). Wagner et al. (2009) found that the use of multiple teaching methods

prepared students for clinical rotations, provided repetition and reinforcement that helps students build competence in newly acquired nursing skills. Simulation allows nursing students to have increased competence through repetition of skills and building self-confidence.

Simulation has been found to increase students' clinical competence through skill performance (Blum et al., 2010). Competence in skill performance in simulation can transfer over to the clinical setting through providing safe care to patients. Simulation has been positively correlated with self-efficacy and clinical judgment (Banbini et al., 2009). Clinical judgment is important to maintaining patient safety in healthcare settings. Using simulation can also increase students' abilities in teaching patients within the clinical setting (Wagner et al., 2009). In advancing healthcare settings, patient teaching is imperative to providing safe and competent care. Clinical competence, clinical judgment, self-efficacy and patient teaching are all very important to students in the clinical setting and are essential to providing safe patient care.

Human Immunodeficiency Virus

Human immunodeficiency virus (HIV) is a disease that damages the body's immune system and makes it very difficult to fight off infections (Cummins & Muldoon, 2014). HIV is spread through blood, semen, vaginal fluid, or breast milk of an infected person and can be transmitted through unprotected sex, sharing needles, pregnancy, child birth, or breastfeeding (Cummins & Muldoon, 2014). A person may be positive with HIV for years before their condition deteriorates in immune function and progresses to Acquired Immune Deficiency Syndrome (AIDS) (Cummins & Muldoon, 2014). Recent figures show an increase of HIV positive people and individuals suffering from AIDS (Ouzouni & Nakakis, 2012). Health care workers, including nurses, have the responsibility for providing teaching about the transmission

of HIV and helping reduce its spread (Ouzouni & Nakakis, 2012). Nurses are expected to be knowledgeable about HIV and prepared to provide adequate care to patients suffering from the disease.

Student perceptions of HIV

As HIV cases are on the rise, nurses play a vital role in caring for patients who are HIV positive. Research has found that nursing students lack the necessary training and education to care for patients who are HIV positive (Diesel, Ercole, & Taliaferro, 2013). Diesel et al. (2013) provided a training program for Cameroonian nursing students including a pretest and posttest survey assessing student knowledge, attitudes, and beliefs. Pretest results indicated that nursing students had stigma towards HIV positive patients and lacked knowledge regarding the HIV virus and how it is spread (Diesel et al.). After the planned teaching session regarding HIV epidemiology, disease management, testing, and legal and ethical issues, students reported a decrease in stigma and an increase in knowledge (Diesel et al.). This study shows that nursing students need more education regarding HIV to decrease negative stigma and change their perceptions of caring for an HIV positive patient. Ensuring that students are knowledgeable about HIV is imperative to ensuring patients receive excellent care.

Student emotions and HIV. Other research has focused on nursing students' emotions towards patients living with HIV. Nursing students who lack proper knowledge tend to fear the unknown when caring for patients with HIV or AIDS. Nazik, Arslan, Ozdemir, and Apay (2012) researched Turkish nursing students' attitudes and emotions towards patients living with HIV utilizing the AIDS Attitude Scale, which measures fear of contagion, negative emotions, and professional resistance. Results indicated nursing students had negative attitudes towards HIV patients, yet if they had some experience with an HIV patient they were more willing to care for

patients living with the disease (Nazik et al., 2012). The study also noted that nursing students had fears of contracting the disease, which contributed towards their negative attitudes towards patients with the disease (Nazik et al., 2012). This study highlights the need to provide more education about HIV to nursing students to decrease their negativity toward patients who are positive. The study also shows that if we can increase their exposure to patients who are HIV positive they are more likely to be willing to provide care for patients who are, in fact, positive. Increasing their exposure will ensure that they can continue to improve the care they provide and gain knowledge regarding HIV positive patients.

HIV is a disease in which people who lack knowledge are often scared of contracting and unsure of the mode of transmission. Numerous research studies have shown that HIV stigma exists among healthcare workers (Shah, Heylen, Srinivasan, Perumpil, & Ekstrand, 2014). HIV stigma is devastating and is common among healthcare workers, especially nurses (Shah et al., 2014). Shah et al. (2014) assessed the acceptability and feasibility of a HIV stigma-reduction curriculum including knowledge, attitudes, and intent to discriminate. Nursing students in this study were provided educational sessions regarding HIV with an HIV stigma assessment tool to follow. Results indicated that 57% of the students had at least one misconception prior to the course and 38% of them blamed the patient for getting the disease (Shah et al., 2014). After the intervention, results indicated a significant increase in student knowledge regarding HIV and students reported it to be practice changing (Shah et al., 2014). Results indicate that students' HIV stigma decreased as their knowledge level increased (Shah et al., 2014). This study shows a need for further education among nursing students regarding HIV. Further education can improve the students' comfort level and decrease any negative perceptions that nursing students may have regarding HIV positive patients. Decreasing these negative perceptions will allow

students to be more open to learning about HIV and how to effectively care for patients who have the disease.

Student knowledge of HIV

For nursing students to be comfortable and confident in caring for HIV patients they must be knowledgeable about the disease. Students also must be familiar with and utilize universal precautions to prevent exposing themselves to diseases such as HIV. Research has focused on nursing students' knowledge of AIDS and health beliefs about universal precautions to prevent HIV infections (Earl, 2010). Universal precautions include treating every patient as if they are infected, by wearing gloves when in direct contact with body fluids such as urine and blood. This study utilized the AIDS Education Information Questionnaire, the AIDS Knowledge Questionnaire, and the AIDS Health Care Belief Scale (Earl, 2010). Results indicated that 27% of the students surveyed would not care for HIV positive patients and 35% were not sure if they would (Earl, 2010). Further results indicated that 37% of the nursing students were not sure how to use Universal Precautions as a method for preventing HIV. This research study showed that nursing students do not feel confident using universal precautions and are fearful of contracting HIV. The study also showed that students must be educated regarding HIV prevention, and personal protective equipment to be confident in caring for HIV patients and to decrease negative attitudes towards patients with the disease.

Other research has focused on nursing students' knowledge of HIV and nursing practices with patients who are HIV positive. Lui, Sarangapany, Begley, Coote, and Kishore (2014) surveyed nursing and medical students' HIV knowledge, attitudes, and practice toward HIV. Results indicated that students with high levels of HIV knowledge had a positive attitude towards the disease (Lui et al., 2014). Further results indicated that a large proportion of the students had

misconceptions about the disease diagnostics and how it is transmitted (Lui et al., 2014). An interesting result indicated that a third of the students thought that HIV was a punishment for immoral behaviors and that sex workers, youths, and high-risk populations were the reason why the disease was spreading (Lui et al., 2014). This study highlights the gaps in knowledge regarding HIV that healthcare students have, showing a need for further education. In order to provide a high level of care, nursing students must be prepared with knowledge of the disease.

Simulation and HIV

Limited research has been conducted regarding using simulation as a teaching strategy for HIV theoretic content. One research study utilized formally trained simulated HIV patients as a method for teaching the role of nurse when caring for HIV positive patients (Trivino, Bernales, Cianelli, Morore, & Peragallo, 2013). Trivino et al. (2013) utilized objective structured clinical examinations (OSCE) using actors as patients for teaching HIV-related care during clinical encounters. After the intervention, focus groups and interviews were utilized to gather information regarding the effects of the roles related to HIV and complexity of the roles (Trivino et al., 2013). Two themes emerged from the interviews: effects of interpreting the roles and complexity of the roles (Trivino et al., 2013). This study looked more in-depth at the role of the actor than the student. Further results indicated that the role of simulated patient in HIV scenarios causes physical and emotional effects including feeling worried and sad (Trivino et al., 2013). Other simulated patients ended up going in for HIV testing after the experience. Results indicated that the simulated patients found the role to be exhausting and draining (Trivino et al, 2013). Future research needs to focus on the role of student during simulated experiences.

Simulation has been found to be a widely used effective teaching strategy for nursing students (Kaplan et al., 2012; Meyer et al., 2014; Raurell-Torreda et al., 2014). Limited research

has been found utilizing high-fidelity simulation as a teaching tool for delivery of HIV content to nursing students. Future research needs to focus on providing hands-on-clinical experience utilizing simulation as a teaching method for HIV and how simulation impacts student self-efficacy. Literature has proven that students lack knowledge regarding caring for HIV positive patients, which correlates with nursing students' negative beliefs and stigma towards the patients. Research has proven that simulation provides students with opportunities to increase their individual self-efficacy (Dunn et al., 2014; Fadale et al., 2014; Leigh, 2008; Sohn et al., 2013). Using simulation as a teaching tool for nursing students regarding HIV may be an effective option to increase their knowledge and comfort level regarding the complex disease.

Summary

In summary, research has found that nursing students lack basic knowledge regarding HIV, which leads to negative attitudes towards caring for HIV positive patients (Earl, 2010; Lui et al., 2014). Nevertheless, further research is needed for utilizing high-fidelity simulation to teach HIV content to nursing students. Future research also should focus on assessing students' knowledge, clinical judgment, and self-efficacy of caring for HIV positive patients. Simulation has been found to be an effective teaching strategy for nursing students that helps further develop their roles as a nurse (Jefferies & Rogers, 2007; Kaplan et al., 2012; Leonard et al., 2010). Jeffries' (2005) simulation framework is an effective guide to designing, implementing, and evaluating simulation as an effective teaching tool. Furthermore, future research should utilize Jefferies' (2005) framework to design research focusing on simulation and HIV. Simulation will allow students to perform actual nursing skills and enhance their communication skills in real-life settings. Simulation enhances student self-efficacy with communication, nursing skills, knowledge, and patient teaching. In addition, simulation has improved clinical competence and

clinical judgment (Blum et al., 2010). Student roles during simulation are important to ensure a variety of learning perspectives are considered (Kaplan et al., 2012). Further research is needed regarding student knowledge, clinical judgment, and self-efficacy regarding HIV from the use of simulation. The development of personal knowledge, clinical judgment, and self-efficacy related to caring for HIV is pertinent to nursing education.

CHAPTER III: METHODOLOGY

Introduction

The purpose of this research study was to identify if using high fidelity simulation (HFS) as a nursing education teaching strategy improves senior level nursing students' knowledge and self-efficacy in relation to human immunodeficiency virus (HIV). The aim of this chapter is to provide a clear explanation of the methods and procedures that were utilized during this research study. The research design, sample, population, and settings will be defined. In addition, a description of the tools, data analysis, and quality measures will be included. This chapter will conclude with ethical considerations and a summary of the chapter.

Research Design

The research design for this quantitative study was quasi-experimental with pretest and posttest design. Quasi-experimental studies utilize participants who are not randomly assigned but are naturally formed groups of convenience (Creswell, 2014). Quasi-experimental research is ideal when the researcher is not able to make random assignments; making control of other factors more difficult (Johnson & Christensen, 2012). Pretest and posttest design can assess if two groups of participants are similar in terms of the dependent variables under investigation (Leedy & Ormrond, 2013). The two groups in this study were the same group of students for the pretest and posttest comparison. The independent variable for this study was high-fidelity simulation (HFS), and the dependent variables were student knowledge and self-efficacy. Using quasi-experimental quantitative research with pretest and posttest design as an approach to investigate using HFS as a teaching tool was logical and provided insight into answering specific research questions regarding students' knowledge and self-efficacy in treating patients with HIV.

Population and Sampling

The population of a research study refers to the larger group the researcher would like to learn about and generalize data to (Johnson & Christensen, 2012). For the purpose of this research study, the population under study or investigation was Bachelor of Science in Nursing (BSN) students enrolled in a Midwestern catholic university with approximately 1,000 students; 300 of which were nursing students. The participants were senior level BSN students enrolled in a multisystem nursing course; there were approximately 50 students enrolled in the course.

Individuals in this study were from a convenience sample with naturally occurring groups making it a quasi-experimental research design (Creswell, 2014). There were several benefits to using a convenience sample including the process being simplified and based on who was available to the researcher (Gay, Mills, & Airasian, 2012). Convenience samples are ideal when the researcher is attempting to utilize students (Cohen, Manion, & Morrison, 2011). Other benefits of a convenience sample are ease of research, expedited results, and low cost (Cohen et al., 2011). A limitation of a convenience sample is that the results are difficult to generalize to the overall population (Gay et al., 2012). For this study, the sample consisted of students enrolled in a 300-level senior multisystem nursing course with a possible sample size of 50 in the cohort of students. To determine if the size of the sample was large enough, it was important for the researcher to utilize two criteria. First, the selected possible participants needed to represent the range of likely participants in the study. Secondly, the redundancy of the data collected led to data saturation (Gay et al., 2012). The sample size, confidence level, and confidence interval also needed to be calculated to ensure the sample size was large enough to represent the population (Cohen et al., 2011). According to Cohen et al. (2011) confidence level chart, the "Ideal sample size for 50 participants would be 42 with a confidence level of 90% and

confidence interval of 5%" (p. 147). A-priori sample size calculator for research utilizing *t*-tests was utilized for a population of this size and reveals an ideal medium sample size of 40.

Setting

The setting for this study was a small, private Midwestern university that is accredited by the Higher Learning Commission (HLC) and the Accreditation Commission for Education in Nursing (ACEN). The research study setting included the high-fidelity simulation laboratory at the university. The setting was structured and artificial (structure of activity designed by the researcher and utilizing HFS which is artificial), meaning they are not naturally occurring but planned and organized by the researcher (Cohen et al., 2011). The laboratory utilized consisted of a one-bed simulation intensive care unit (ICU) setting, containing one high-fidelity simulation mannequin and two-way glass, which allowed for visualization of the simulation exercise in real time. The laboratory setting mimicked an actual ICU room, making it more realistic to that of an actual hospital room. In addition, the laboratory had videotaping and live streaming capabilities, which could be used for discussion after simulations.

Data Collection Tools

Several tools were utilized to assess how high-fidelity simulation (HFS) impacts students' knowledge of HIV and self-efficacy. One tool included 25-item knowledge based National Council Licensure Examination (NCLEX) style multiple choice exam questions written by the researcher (Appendix A). Construction of the questions followed exam item guidelines to ensure test items were sound and written in the most effective manner (Morrison & Walsh-Free, 2001). Criteria for the multiple-choice questions included: rationale for each correct answer, and items written at an application or above cognitive level according to Bloom's taxonomy (Morrison & Walsh-Free, 2001). Questions were also written at a level to encourage the participants to utilize

multi-logical thinking and discrimination to answer correctly (Morrison & Walsh-Free, 2001). Following this process ensured that the exam questions were reliable for this study. The tool was tested for reliability using statistical analysis to determine Cronbach's alpha analysis. The Cronbach's alpha coefficient for the 25-item NCLEX style multiple choice tool was 0.78, indicating reliability. Reliability analysis is conducted to reveal how closely a group of items are related to each other (Urban, 2010).

To verify validity, each of the 25-item NCLEX style multiple choice exam questions were reviewed by Ann Fitzgerald, Advanced Practice Registered Nurse (APRN), HIV expert employed at the University of Nebraska Medical Center Nebraska AIDS and Education Training Center. Each exam question was checked to ensure accuracy and that it was consistent with current HIV nursing practice standards. Content validity is measured by utilizing the knowledge of people who are familiar with the topic being measured (Cohen et al., 2011). These subject-matter experts are usually provided a tool and are asked to provide feedback on how each item measures the topic being researched (Cohen et al., 2011). The HIV content expert was asked to provide feedback for each test item and changes were made, as necessary, by the researcher. These exam questions assessed the students' foundational knowledge of HIV before and after a HFS with an HIV patient. NCLEX style multiple choice questions are used to test nursing students' knowledge and are the type of questions administered for licensure on state examinations (Morrison & Walsh-Free, 2001). HFS has been found to improve knowledge acquisition in undergraduate nursing students (Lapkin, Fernandez, Levett-Jones, & Bellchambers, 2010).

The second tool utilized was the *General Self-Efficacy Scale* (GSES). The scale was designed to assess a general sense of perceived self-efficacy with the aim of measuring students'

abilities to cope with daily stresses and adaptation to stressful situations (Schwarzer & Jerusalem, 1995). Assessment of the general beliefs of participants' own ability to respond to difficult situations and to deal with obstacles or set-backs is accomplished using the tool (Schwarzer & Jerusalem, 1995). The tool included 10-items using a 4-point Likert scale to assess the students' level of perceived self-efficacy (Appendix B). An example of an item from the GSES includes "I can always manage to solve difficult problems if I try hard enough" (Schwarzer & Jerusalem, 1995, p 1). The GSES took several minutes to complete and respondents indicated the context to which each statement applies to them. Reliability testing of the GSES through multiple studies found alpha coefficients ranging from 0.82 to 0.93, showing reliability (Schwarzer & Jerusalem, 1995). Concurrent and predictive validity of the GSES was established measuring self-esteem, internal control beliefs, and optimism (Schwarzer & Jerusalem, 1995). Factor analysis showed the GSES to be unidimensional, measuring a unitary concept (Schwarzer & Jerusalem, 1995). The tool was administered pre-and post a high-fidelity simulation with an HIV positive patient and results indicated how students rated their level of self-efficacy regarding caring for an HIV positive patient. The GSES took approximately 3 minutes for the participants to complete. Permission to utilize this tool was granted by the author and a letter of permission was obtained (Appendix C).

Data Collection Methods

The planned data collection method for this quasi-experimental research study was outlined below. Pretest and posttest methods were utilized before and after a high-fidelity simulation with an HIV patient including 25-multiple-choice questions and the GSES. The following section reviews participant recruitment methods.

Participant recruitment. Following Institutional Review Board (IRB) approval, participants were asked to participate in this research study. The researcher attended a class session to explain the study and provide students with a letter of invitation (Appendix D). All students enrolled in the class were asked to participate in the study. At this face-to-face meeting, the content and design of the study was addressed and consent was obtained (Appendix E). Upon completion of the study students who participated received a $5 gift card to the campus coffee shop.

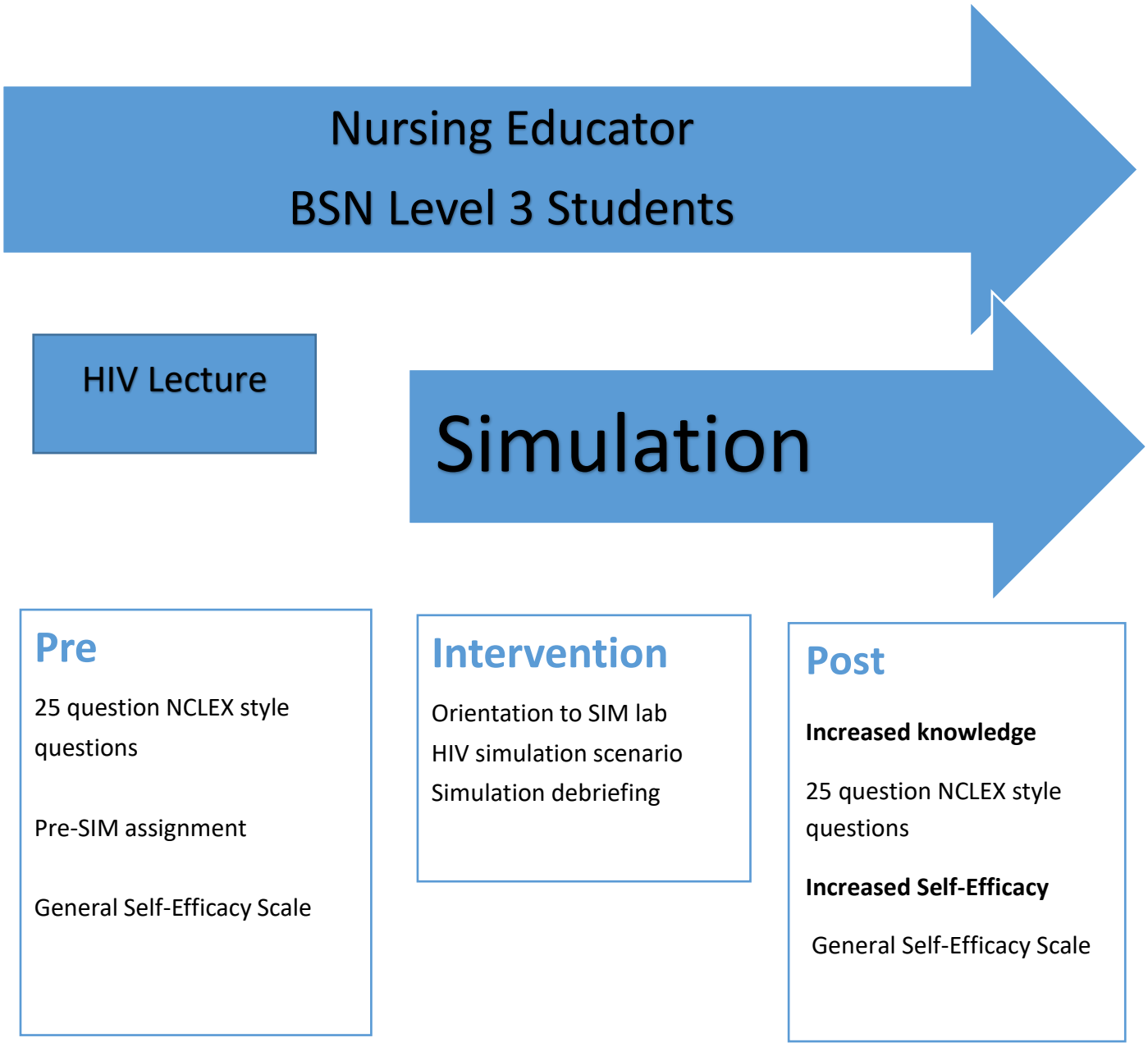
Data collection. All students enrolled in the senior level multisystem course received a 2-hour lecture over the pathophysiology of HIV, treatment, transmission, and nursing care as part of the normal course content from their regularly assigned faculty member. A pre-simulation assignment was assigned to each student enrolled in the course (Appendix G). An HFS with an HIV positive patient was also part of the course (Appendix J). Upon receiving consent, a level 3 nursing faculty member administered the 25-item NCLEX style exam questions and GSES. Clear directions were provided to the participants regarding how to complete the GSES with rankings based upon their perceived self-efficacy levels specific to caring for an HIV positive patient. Multiple choice and multiple select questions covered basic HIV content regarding disease transmission, nursing care, and patient teaching. Participants were also asked two demographic questions including the participant's age and if they have ever cared for an HIV patient (Appendix H). Both tools were completed via paper and anonymously coded by the same doctoral prepared faculty member who administered the pretest and posttest to ensure anonymity of the participants. Only students completing the study were administered these tools.

Next, study participants completed the HFS beginning with a brief tour of the simulation lab and a demonstration of the mannequin functions by the researcher. In addition, the students were

randomly assigned roles for the simulation which included: new graduate nurse, primary nurse, medication nurse, documentation nurse, observer of primary nurse, observer of new graduate nurse, observer of medication nurse, and observer of the documentation nurse. The patient's wife was a faculty member to ensure consistency amongst each simulation. Students were given a script describing their role in the HFS in detail. The role was coded to match the participants' examinations. The researcher ran the HFS from behind the two-way glass, serving as the role of the patient. All students enrolled in the course took part in the HFS with an HIV patient written by the researcher, which lasted approximately 20 minutes with a 20-minute debriefing session following. Due to technical difficulty, the use of video streaming was not integrated into the debriefing session. For consistency, debriefing of each HFS group was conducted by the same course faculty member. Debriefing sessions included discussion of the students' perceptions of the simulation, utilizing several probing questions to facilitate learning (Appendix I). Structured debriefing allowed students to recall and reflect on what they have learned during the simulation and to assess their actions, decisions, and communication in the HFS (Jeffries & Rogers, 2007). At the conclusion of the debriefing session, participants completed the 25 multiple-choice questions and the GSES. These tools were administered by the same level 3 faculty member who administered the pretest. The coded 25-item multiple-choice questions and GSES paper/pencil tools were completed anonymously and took approximately 20-30 minutes. The same tools were used for both pre-test and post-test. Upon completion, the participants left the classroom and were finished with the study. Figure 1 depicts the data collection plan described above.

Figure 1

Data Collection Plan



Data Analysis Plan

When all data collection had been completed the researcher began the data analysis process using Statistical Practice for Social Sciences (SPSS) version 24. The demographic data was

analyzed using SPSS for the mean age and percentage of participants who have cared for a HIV patient. Parametric statistical analysis was completed to compare the pre-and posttest results. Paired sample *t*-tests were conducted on the total score data for 25 multiple-choice exam questions and GSES. Paired *t*-tests were used to compare the means of paired or matched samples to a single variable (Urban, 2010).

Mixed factorial analysis of variance ANOVA was completed comparing results of the 25-item multiple-choice questions for participants with and without experience with HIV patients. Mixed method factorial ANOVA allowed the researcher to compare differences between the groups and within the groups (Urban, 2010). Analysis of demographic data, results of multiple choice exam questions, and parametrical analysis of the pre-and post-25-item questions and GSES allowed the researcher to have a clear ide~~a~~ of the impact of HFS on nursing students' knowledge attainment.

Data Quality Measures

Microsoft Excel was utilized for coding of data. Data cleansing was utilized to ensure accuracy and completeness of data. Missing values were provided with a special code. Careful data entry was conducted to ensure accuracy, and data verification was completed by the researcher. Data cleansing usually involves two types of checks including: outliers and wild codes (Polit & Beck, 2017). The data from this research study included assessments for any outliers that fell out of the normal range of values. The data was also assessed for any wild codes, or codes which are not possible (Polit & Beck, 2017). Completed tools were assessed for accuracy and completeness.

Ethical Consideration

The researcher took all necessary steps to ensure that the research study was conducted in an ethical manner. These steps include confidentiality of the participants, voluntary participation, and informed consent. Anonymity of the participants was maintained. Approval of the university's Investigational Review Board (IRB) was obtained prior to conducting this study.

Investigational Review Board (IRB) approval. Due to the nature of the study with limited risk or harm to the participants it was determined that an expedited review from IRB was appropriate. The application was approved by the IRB (Appendix M) after expedited review.

Informed consent. Upon receiving IRB approval, participants were approached during their advanced multisystem course and asked to participate in the study. Potential participants were informed of the nature of the study, the methods of data collection, topic under study, activities and time commitment that was required for the study. Potential participants received a hard copy of a letter explaining the study design and inviting them to participate (Appendix E).

Next, prospective participants were provided with *The Rights of Research Participants form* (Appendix F). The participants were also informed of their ability to leave the study at any point without fear of any negative consequences. At this time, coded envelopes and consent forms were administered to each prospective participant and all folders were returned to the program director to maintain confidentiality (Appendix E).

Methods to maintain confidentiality. The participants in this research study were unknown to the researcher. To ensure anonymity, all data collected was collected anonymously and kept confidential. All electronic materials related to the study were kept on the researcher's password protected computer. All other documents and any external computer drives were kept

in a locked filing cabinet in the researcher's office; accessible only by the researcher. Any discussions with the participants regarding the study was kept confidential by the researcher. Upon completion of the study all materials will be kept secure, as described above, for three years and then destroyed by the researcher.

Summary

Chapter three clearly outlined the selected research design, population, and setting. A quasi-experimental design was selected because it fits the purpose and methodology of the study (Creswell, 2014). Specific tools, methods of data collection and analysis, and ethical considerations were also included. Both research tools described were found to be valid, and reliable for accurate data collection. Appropriate methods of data collection were identified to determine if using HFS as a nursing education teaching strategy improved senior level nursing students' knowledge and self-efficacy in relation to HIV. IRB approval was obtained prior to gathering any data. Data quality measures including utilization of SPSS, data cleansing, and careful coding were taken to ensure accuracy and high-quality data collection. The researcher took all measures necessary to ensure the participants' ethics were not violated in any way. Confidentiality was also addressed and specific measures were taken by the researcher to ensure participants remained anonymous.

CHAPTER IV: RESULTS

Introduction

The purpose of this quasi-experimental quantitative research study was to identify if using HFS as a nursing education teaching strategy improved senior level nursing students' knowledge of HIV and self-efficacy. The research study aimed to answer the following research questions:

1. What is the impact of HFS on BSN students' ability to answer knowledge based NCLEX style questions regarding HIV?

2. What is the impact of HFS as a teaching strategy on BSN students' self-efficacy levels when caring for a simulated HIV positive patient as measured by the General Self-Efficacy Scale (GSES)?

The statistical methods utilized for data analysis, statistical results, and significance of the results will be discussed in this chapter. The significant findings for the two research questions will be reported with a summary of the results. Statistical significance for the results was established using an alpha level of $p < .05$ and marginal statistical significance of between .05 and .10. Results of demographic data will also be reported in this chapter.

This research study was conducted at a small, private Midwestern university that is accredited by the Higher Learning Commission (HLC) and the Accreditation Commission for Education in Nursing (ACEN). The research study setting was the high-fidelity simulation (HFS) laboratory at the university. The laboratory utilized consisted of a one-bed simulation intensive care unit (ICU) setting, containing one high-fidelity simulation mannequin and two-way glass, which allows for visualization of the simulation exercise in real time. The sample included 43 of the 50 students enrolled in a 300-level senior multisystem nursing course, meeting

the ideal sample size with a confidence level of 90% and confidence interval of 5%. Of the 50 possible participants, two chose not to participate, four were absent the day the pretest was administered, and one participant did not complete the posttest due to illness.

Statistical Analysis

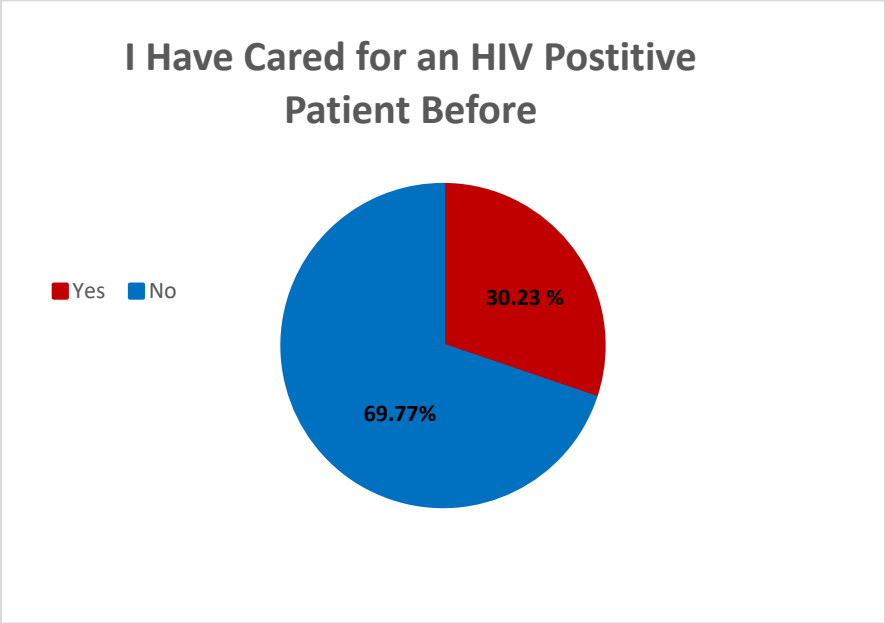
The Statistical Package for Social Sciences (SPSS) v. 24 was used for all data analysis. The demographic data was analyzed using SPSS for the mean age and percentage of participants who had experience caring for an HIV patient. Paired sample *t*-tests were conducted to examine the pre-and posttest total scores for the 25-item multiple choice exam questions and GSES. In addition, paired *t*-tests were utilized to compare the means of the individual 10 items on the GSES. A mixed factorial analysis of variance (ANOVA) was completed comparing the 25-item multiple choice question results of participants with and without experience caring for an HIV patient.

Demographic Analysis

A total of 43 senior level Bachelors of Science nursing students participated in the study. Participants were between the ages of 21 and 40 years of age and were all female (100%). The mean age for the participants was 25.5 years of age. Thirteen of the participants (30.23%) reported caring for an HIV positive patient in the past, with 30 (69.77%) reporting having no experience caring for a patient with HIV prior to the HFS as shown in Figure 2.

Figure 2

Percentage of Participants Who Have Cared for an HIV Positive Patient



Research Question: #1: What is the impact of HFS on BSN students' ability to answer knowledge based NCLEX style questions regarding HIV?

Results of the 25 item-NCLEX style multiple choice questions showed that participants had a 64.00% exam average before the HFS and a 64.47% exam average post simulation. Pretest exam averages ranged from 44-80% with posttest ranges being 44-84%. Paired sample *t*-tests were utilized to compare the pre-and post HFS multiple-choice questions. Results indicated that the HFS did not significantly increase participants' ability to answer knowledge based NCLEX style multiple choice questions regarding HIV $t(42) = -0.38$, $p > .05$). See Table 1.

Table 1

Means and Standard Deviation of the Pretest Posttest 25-Item Multiple Choice Exams

	M	*SD*	*N*
Pretest	64.00	9.23	43
Posttest	64.47	9.88	43

A mixed factorial analysis of variance (ANOVA) was computed examining the effects of time (pre-posttest) and previous experience caring for an HIV patient (yes/no) on performance on the 25 HIV knowledge questions. The overall factorial ANOVA was not significant, $p > .05$. Specifically, participants did not show a significant improvement from pretest ($M = 63.97$) to posttest ($M = 64.42$), $p > .05$. Results indicated that participants who had experienced caring for an HIV patient prior to the simulation had a higher mean exam average ($M = 64.00$) than the participants who did not have experience caring for an HIV patient ($M = 61.23$). Posttest results revealed that mean averages for participants who did not have experience caring for an HIV patient surpassed the group with experience after the simulation ($M = 65.87$). Table 2 displays the differences between the means.

Table 2

Pretest Posttest Results between Students with and without HIV Patient Experience

HIV Experience	Time	*M*	*SE.*	*N*
Yes	Pretest	64.00	2.59	13
	Posttest	64.00	2.71	13
No	Pretest	61.23	1.70	30
	Posttest	65.87	1.78	30

When examining the interaction effect of previous experience with HIV patients and performance from pre-to posttest, the results revealed marginal significance within the group, $F(1,41) = 3.12$, $p = .09$. Those with previous experience with HIV patients scored nearly identically from pretest ($M = 64.00$) to posttest ($M = 64.00$), while those with no experience showed an improvement from pretest ($M = 61.23$) to posttest ($M = 65.87$). Table 3 displays ANOVA results between participants with and without experience caring for HIV patients.

Table 3

ANOVA Results

Source of Variation	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
Between groups	3.69	1	3.69	0.12	0.73
Within groups	97.46	41	97.46	3.12	0.09
Total	101.16				

Research Question #2: What is the impact of HFS as a teaching strategy on BSN students' self-efficacy levels when caring for a simulated HIV positive patient as measured by the General Self-Efficacy Scale (GSES)?

Results of the GSES paired sample *t*-tests revealed statistical significance for two of the 10 scale items and marginal significance for one of the 10 items on the scale. Item number four on the GSES asked the participants "I am confident that I can deal with unexpected events". Results of the paired sample *t*-tests revealed marginal significance for participants' mean answers to this question ($t(42) = -1.84$, $p < .05$). Score ranges for item number 4 were between 1.0-4.0 on the pretest and 2.0-4.0 on the posttest. Scores were higher on the posttest compared to

the pretest (see Table 4 for means). In addition, results indicated statistical significance for item number 5, which asked participants "Thanks to my resourcefulness, I know how to handle unforeseen situations" ($t(42) = -3.77$, $p<.05$). Score ranges for item number 5 ranged from 2.0-4.0 on the pretest and 2.0-4.0 on the posttest. The paired sample *t*-tests indicated statistical significance for item number 8, asking participants "When I am confronted with a problem, I can usually find several solutions" ($t(42) = -2.38$, $p<.01$). Score ranges for item number 8 ranged from2.0-4.0 on the pretest and 2.0-4.0 on the posttest. After the simulation students' mean average for the self-efficacy levels for these scale items was higher than before the simulation (Table 4). Table 4 depicts a comparison of the means of the pre-post GSES and *p* values of each.

Table 4

Comparison of the General Self-Efficacy Scale Pretest and Posttest HIV Simulation

	Time		
GSES Questions	Pretest *M*	Posttest *M*	*p*- level
1. I can always manage to solve difficult problems if I try hard enough.	3.28	3.40	0.13
2. If someone opposes me, I find the means and ways to get what I want.	2.42	2.60	0.10
3. It is easy for me to stick to my aims and accomplish my goals.	3.47	3.51	0.41
4. I am confident that I could deal efficiently with unexpected events.	3.21	3.40	0.07
5. Thanks to my resourcefulness, I know how to handle unforeseen situations	3.00	3.33	0.00
6. I can solve most problems if I invest the necessary effort.	3.56	3.65	0.37
7. I remain calm when facing difficulties; I rely on my coping abilities.	3.28	3.33	0.68
8. When confronted with a problem, I can usually find several solutions.	3.14	3.42	0.02
9. If I am in trouble, I can usually think of a solution.	3.21	3.33	0.17
10. I can usually handle whatever comes my way.	3.23	3.35	0.28

Results Summary

In summary, a total of 43 senior level Bachelors of Science nursing students participated in the study. Demographic data revealed the mean age of the participant to be 25.5 year of age and that most participants (69.7%) had not cared for an HIV patient prior to the HFS. Data analysis using paired *t*-test did not reveal statistical significance for the 25-item NCLEX style HIV knowledge posttest following the HFS with an HIV patient. Results of the pre-posttest multiple-choice exams showed that participants had a 64.00 % exam average before the HFS and a 64.47% exam average post simulation. Table 1 displays the results of the means and standard deviation for this portion of the study. A mixed factorial analysis of variance (ANOVA) comparing the 25-item multiple choice exam results of participants with and without experience caring for an HIV patient revealed marginal statistical significant differences within the two groups, but no statistical significance between the pre-post HIV group with and without experience. Paired *t* tests showed statistical significance for two of the 10 items on the GSES. Marginal statistical significance was noted for one item on the GSES scale after the intervention. Although not statistically significant, students' mean average for the self-efficacy levels for several scale items after the simulation was higher than before the simulation.

CHAPTER V: DISCUSSION OF FINDINGS

Introduction

As nursing education continues to advance, using high-fidelity simulation (HFS) as a teaching tool is important to facilitate and foster the development of nursing student self-efficacy and reinforce theoretical knowledge. Nursing educators need to be aware of the impact that using HFS as a teaching strategy has on student self-efficacy and development of theoretical HIV knowledge. The purpose of this research study was to identify if using HFS as a nursing education teaching strategy improves senior level nursing students' knowledge of HIV and self-efficacy at a small, private Midwestern university. The intent of the research design was to measure nursing student knowledge regarding HIV and their level of self-efficacy before and after completing an HFS with an HIV positive patient. The research questions that this study sought to answer were:

1. What is the impact of HFS on BSN students' ability to answer knowledge based NCLEX style questions regarding HIV?

2. What is the impact of HFS as a teaching strategy on BSN students' self-efficacy levels when caring for a simulated HIV positive patient as measured by the General Self-Efficacy Scale (GSES)?

Chapter five will explore the results of the research as they correlate to the review of literature and theoretical framework, implications to nursing education, and limitations of the study. The following chapter will include examination of future research needed regarding using HFS as a teaching tool to foster development of student knowledge and self-efficacy regarding care for HIV positive patients.

Results and Correlation to Literature

Research question number 1. The first research question of this study addressed what impact HFS has on BSN students' ability to answer knowledge based NCLEX style questions regarding HIV. Regarding the first research question, HFS did not significantly increase nursing students' ability to answer pretest HIV-knowledge based NCLEX style questions. Results of nursing student knowledge about HIV in this study were significantly lower in comparison with other studies comparing HIV knowledge, which revealed mean HIV knowledge scores ranging from 70.00%-80.00% (Earl, 2010; Lui et al., 2014; Ouzouni & Nakakis, 2012). These studies utilized standardized survey instruments with general HIV knowledge questions relating to sexual transmission, treatments, and disease prevention, whereas the tool utilized in this study focused on a variety of HIV knowledge topics from a nursing education perspective focusing on pathophysiology, transmission, specific HIV treatment, and nursing implications. Results of this study revealed nursing students had a significantly lower knowledge level regarding HIV despite attending a 2-hour lecture over content and participating in a HFS with an HIV positive patient. Other studies have shown that nursing students have increased knowledge after completing a HFS (Kaplan et al., 2012; Lewis & Ciak, 2011; Shinnick & Woo, 2014). Shinnick and Woo (2014) used a series of HFS to determine if there was, in fact, a correlation between nursing student knowledge and self-efficacy. Interestingly, they did not find the two to be significantly correlated. Unlike this study, as discussed in chapter 4, knowledge levels of HIV did not significantly increase while self-efficacy levels did.

Several confounding variables have been identified by the researcher to help explain the lower results on the HIV student knowledge portion of this study. These variables include lack of student preparation prior to the theory lecture and HFS. Since the pretest was given

immediately following the 2-hour lecture, students failing to prepare prior to the lecture by completing the reading assignment may have resulted in poor outcomes. In addition, participants who chose not to complete the pre-simulation assignment (Appendix G) may have performed better if they had taken the time to complete it and prepare themselves for the HIV simulation. Requiring students to complete a written assignment prior to the HFS rather than just a reading assignment, may have impacted student performance during the simulation and during the posttest.

Another potential cause of the poor performance on the pretest NCLEX style HIV knowledge questions is that the textbook utilized during the HIV lecture and reading assignment is new to the curriculum and contains limited content regarding HIV in general. This may have had a negative impact on participant performance for both the pre-and posttest results. Another potential confounding variable is that no grades for the HIV questions were given thereby limiting the degree of participant commitment to learning the content. It may, in fact, be that the participants did not take questions seriously utilizing less than full effort, leading to decreased participant scores. If this portion of the study had been part of the course, participants may have prepared more for both the lecture and HFS resulting in a significant increase in HIV knowledge.

Results comparing experience with HIV patients and the effects of time on performance of the 25-item NCLEX style knowledge questions did not reveal a significant difference between the two groups, but did show a marginal significance within the pre-and posttests. Results indicated that participants who had experience caring for an HIV patient prior to the simulation had a higher mean exam average than the participants who did not have experience caring for an HIV patient. The results indicate that participants with experience caring for an HIV positive patient were more knowledgeable regarding the disease than participants who had not cared for a

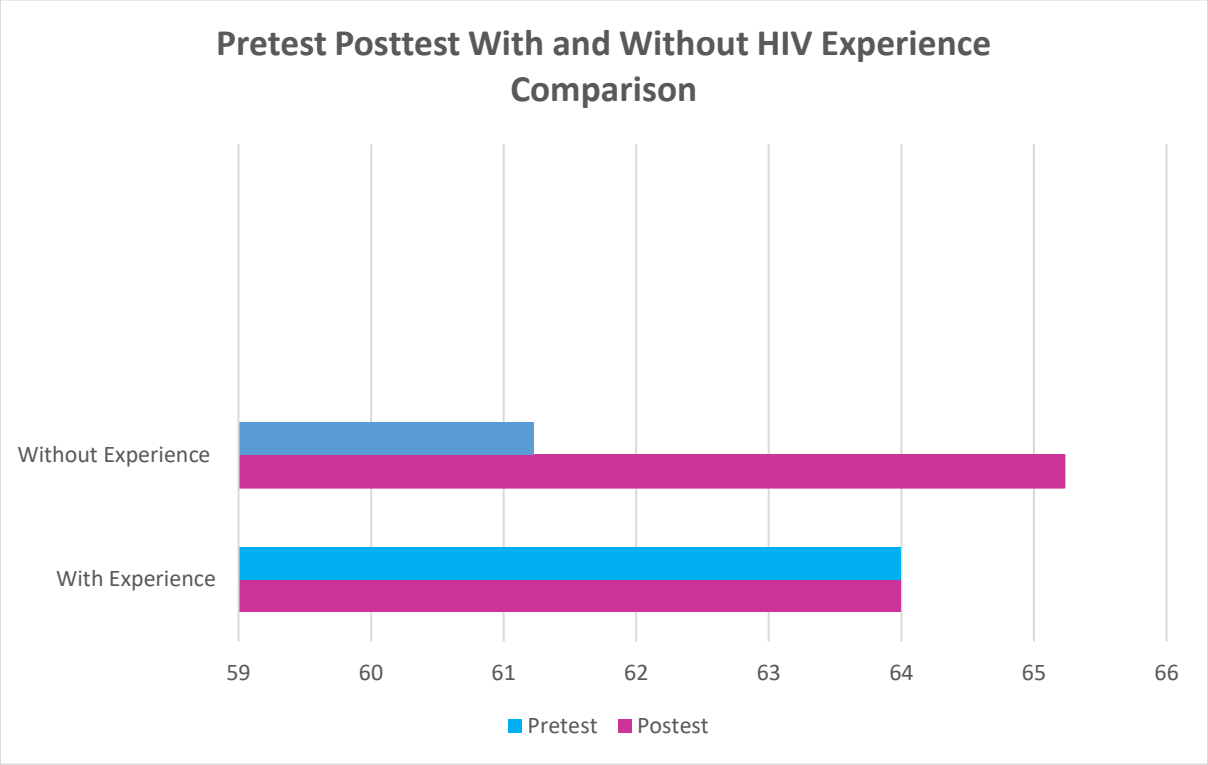
HIV positive patient. This correlation indicates that to gain knowledge regarding caring for HIV positive patients, nursing students need to be given opportunities to care for patients with HIV. Interestingly, past research studies have shown that nursing students who are knowledgeable regarding HIV have a more positive attitude towards caring for these types of patients and are more willing to care for this patient population (Lui et al., 2014; Nazik et al., 2012). Creating HFS with HIV positive patients is one way nurse educators can facilitate these valuable experiences for all students.

In addition, posttest results revealed that mean averages for participants who did not have experience caring for an HIV patient surpassed the group with experience after the simulation. One possible reason for this increase could be that the participants who lacked actual patient experience with an HIV positive patient perceived that they gained more experience from the HFS than those who already had experience. The participants lacking experience may have gone into the experience more open-minded and eager to learn, resulting in increased self-efficacy after the HIV HFS. Participants with experience may have felt that they already had patient experience, not taking the HFS as seriously, inhibiting their learning, and resulting in no changes to their perceived self-efficacy levels. These results suggest that the HFS did cause participants who lacked experience caring for an HIV patient prior to the HFS to gain more knowledge regarding HIV than the participants who had experience. Conclusions can be drawn that HFS had a positive impact on the participants who lacked past patient experience. These results are comparable to past research findings indicating that HFS does provide students with valuable learning experiences and using it as a teaching strategy can assistant in the linkage of theory to practice and contributes to nursing students' learning processes (McCaughey & Traynor, 2010; Meyer et al., 2014; Shepard et al., 2010). The results of this study confirm that using HFS as a

teaching tool provides students who have no experience with HIV positive patients the opportunity to gain more knowledge and apply theoretical knowledge to replicated patient scenarios. See Figure 3.

Figure 3

Comparison of Pretest Posttest Means and Experience with an HIV Patient



Research question number 2. The second research question asked during this study addressed the impact of HFS as a teaching strategy on BSN students' self-efficacy levels when caring for a simulated HIV positive patient as measured by the General Self-Efficacy Scale (GSES). Several conclusions can be drawn from the results of the GSES pretest and posttest. Two of the 10 scale items of the GSES showed statistical significance, and one of the 10 items showed marginal statistical significance. Item number four on the GSES asked the participants to rate their agreement with the following statement: "I am confident that I can deal with

unexpected events", indicating that the HFS with an HIV positive patient increased student confidence levels with dealing with unexpected events. After completing the HFS with an HIV positive patient, students expressed increased confidence levels when dealing with unexpected events. These findings parallel results of other research studies showing that using HFS as a teaching tool increases student self-confidence (Bambini et al., 2009; Blum et al., 2010; Smith & Roehrs, 2009). An innovative teaching strategy such as HFS not only allows students to gain new experiences and practice skills, but also increases their individual confidence in decision making. This self-confidence is essential in caring for patients with changing health care needs upon graduation and entering practice.

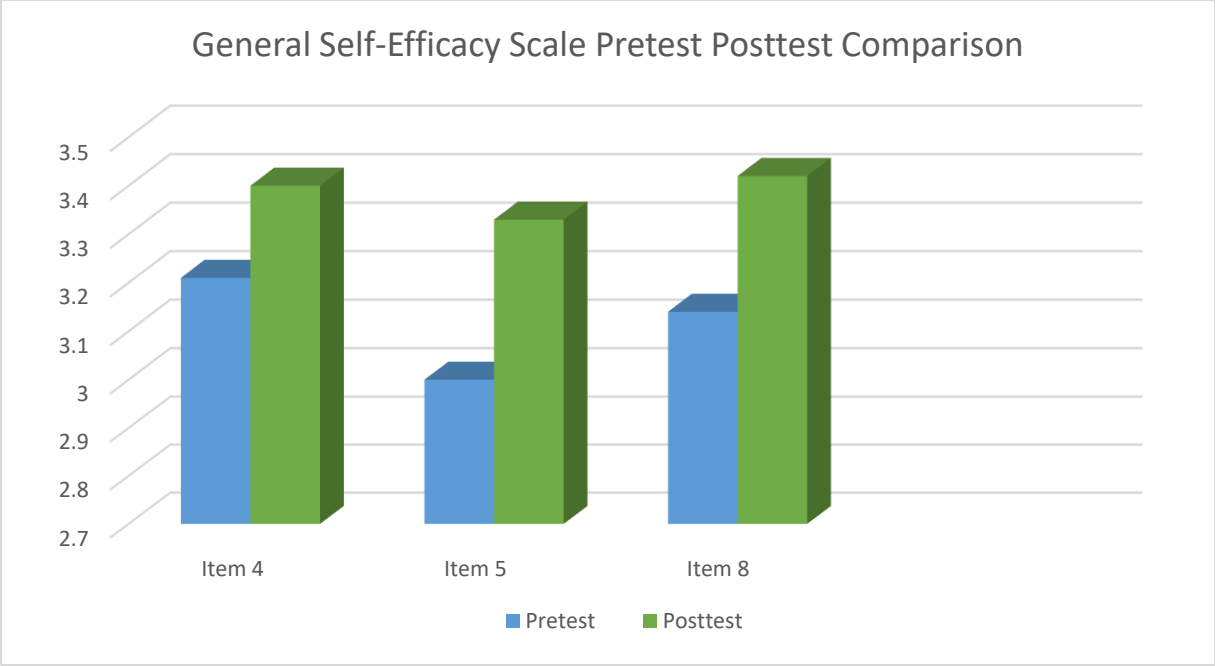
The next item on the GSES that significantly increased was item number eight, "When I am confronted with a problem, I can usually find several solutions". These findings suggest that using HFS as a teaching tool increases nursing students perceived self-efficacy in problem solving. Nursing students' ability to solve problems that arise during patient care is a key component of providing safe care. A key component of the development of clinical judgment is problem solving (Blum et al., 2010). These results support past research findings that show HFS has a positive impact on nursing students' development of clinical judgment (Bambini et al., 2009; Lavoie et al., 2013). Nursing student self-efficacy in problem solving has been found to be essential in the development of clinical judgment. Utilizing HFS is one teaching strategy nursing faculty must continue to integrate across curriculums to foster the development of clinical judgment.

Statistical analysis revealed marginal significance for item number 5 on the GSES, "Thanks to my resourcefulness, I know how to handle unforeseen situations". From these results, the researcher can conclude that HFS increases nursing student self-efficacy regarding

dealing with changing unpredictable patient situations. Findings of this study support the theory found through past research that using a HFS as a teaching strategy increases student self-efficacy levels (Leigh, 2008; Shinnick & Woo, 2014; Sohn et al., 2013). Results highlight that using HFS as a teaching tool increases nursing students' self-efficacy in caring for patients in clinical situations that require them to make decisions based on patients' changing healthcare status, which is needed in the development of their clinical judgment. Figure 4 displays the relationship between student rankings on the GSES items that were marginal to statistically significant.

Figure 4

General Self-Efficacy Scale Comparison of Significant Results



Correlation to Theoretical Framework

As discussed in chapter two, this study confirms Rogers' (1969) *Theory of Learning* which proposed that knowledge obtained from interaction with others is a basis for forming

personal knowledge. Students who already had experience caring for an HIV positive patient prior to the simulation performed significantly better on the HIV knowledge pretest. Nursing students' personal knowledge is cohesive with their nursing knowledge; these two types of knowledge build upon each other as students gain experiences. In addition, the results of this study support Moch's (1990) *Theory of Personal Knowing* regarding experiential learning. Part of this theory is that understanding and knowing comes from life experiences and connections with others (Moch, 1990). Using HFS as a teaching strategy provided nursing students the opportunity for experiential learning, fostering the development of their personal knowledge.

The results of this study show that nursing students learn through life experiences such as caring for HIV positive patients, and develop knowledge from these experiential learning experiences. Interestingly, the participants without experience with an HIV positive patient improved more between the pre-and posttest than the participants who had experience caring for an HIV positive patient. This confirms the need for structured HFS for students who have never cared for an HIV positive patient. The results of this and previous studies demonstrate that simulation as a teaching strategy does significantly increase student self-efficacy in caring for an HIV positive patient, reinforcing Bandura's (1993) social cognitive theory. Bandura (1993) provided a clear definition of self-efficacy and how it develops which is very applicable to college students. Teaching strategies like HFS must be tailored to providing learning opportunities that foster the growth of nursing students' self-efficacy. Faculty need to develop simulations for diseases, such as HIV, that are not commonly seen in all clinical settings. Although results of this study demonstrate that HFS with HIV positive patients does not always increase student knowledge, it does have a significant influence on nursing students' self-efficacy in providing care.

This study suggests that for HFS to be a successful teaching tool, developers of simulation scenarios should utilize Jeffries' (2005) simulation framework as a guide for designing, implementation, and student debriefing. Jeffries' (2005) framework helped guide the researcher in developing an organized, creative simulation that promoted improvement of students' self-efficacy. For learning to occur successfully, simulations must be designed properly and utilize appropriate organization (Jeffries, 2005). Jeffries' (2005) simulation framework ensures that the educator integrates sound simulation into their curriculum in a sequential manner, delivering quality educational opportunities for nursing students. Using HFS allows nursing students to build self-efficacy and apply nursing knowledge to replicated HIV positive patient experiences.

Implications to Nursing Education

The goal of this study was to determine if using HFS as a teaching tool increases student knowledge and self-efficacy regarding caring for an HIV positive patient. Results showed using HFS as a teaching tool increases student self-efficacy in caring for an HIV positive patient. Integrating HFS using an HIV positive patient allowed students to gain valuable hands on experience. This method of teaching is found in the literature to be effective and more simulations should be integrated into BSN programs. Based on the results of this study, nursing faculty members should ensure that HFS with an HIV positive patient are integrated into their curriculum to provide students the opportunity to care for this type of patient. The reported findings imply that faculty members should invest time, careful organization, and planning prior to integrating HFS into undergraduate nursing courses to ensure successful student learning.

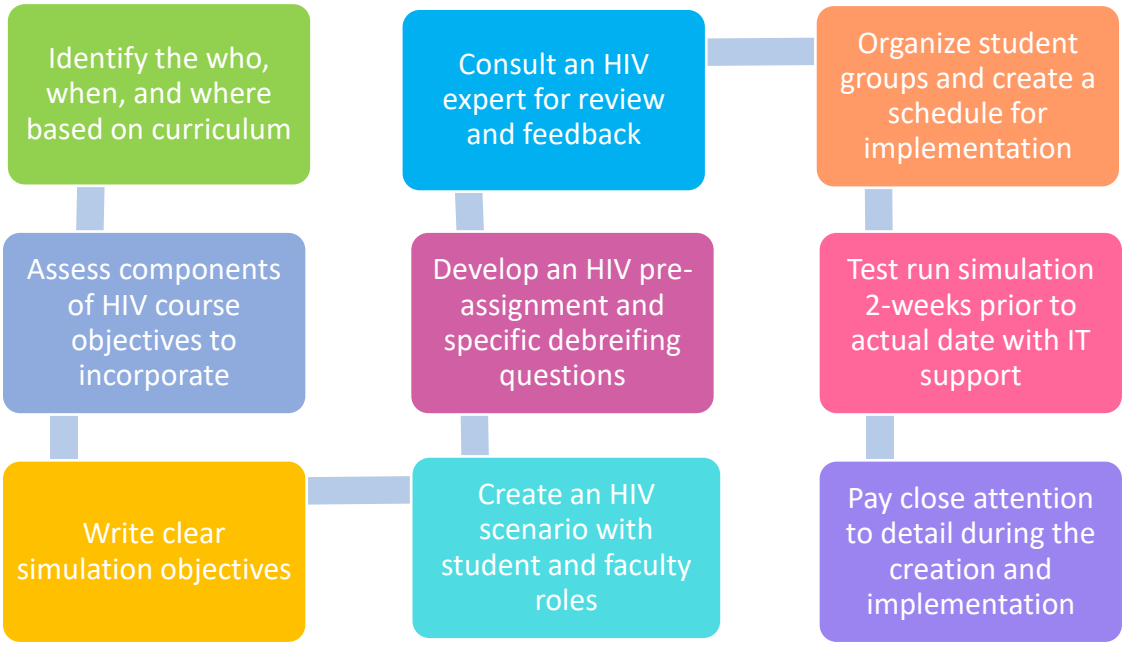
To create the most effective learning experience, Jeffries & Rogers' (2007) simulation framework should be followed closely to design the HFS. Careful consideration of the level of

the program and student, educational practices, and outcomes must be examined to ensure the HIV HFS is integrated into the right place in the curriculum and is appropriate for the level of students. HFS outcomes must focus on the nursing knowledge, skill performance, critical thinking, and self-confidence to ensure students' learning needs are addressed (Jeffries & Rogers, 2007). Careful design of the HFS will ensure that nursing students are provided with quality learning opportunities that facilitate the development of HIV knowledge and allow practical application of skills that increase self-efficacy in caring for HIV positive patients.

Current HIV theoretical knowledge should be included in the HIV simulation to ensure that the most recent evidence based practice guidelines are incorporated into the simulation. Utilization of national standards from the Center for Disease Control is important to ensure the HIV HFS in built on the most up-to-date standards of care. Consulting an HIV expert in the community to review the HFS is important to ensure the most current standards of practice regarding HIV medication administration and teaching are being incorporated into the HFS. It is important for educators to invest time in taking this extra step to ensure high quality HIV HFS are developed and that they are applying evidence-based nursing practice. Figure 5 provides nurse educators a step-by-step guide to creating an effective HIV simulation for their individual nursing program.

Figure 5

Pathway to Implementing a High-Fidelity HIV Simulation



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Limitations of Study

Several limitations for this study were discovered. First, this study was conducted at a single university with a sample size from only senior level BSN students from one course, limiting generalizability. Perspectives from multiple program levels were not part of the study. Investigating the difference of student development of knowledge and self-efficacy regarding HIV from freshman level compared to senior level could have provided more insight to the researcher. Due to the placement of the HIV content in the curriculum and time constraints this was not feasible for the researcher to do. Another limitation of the study was slight variations throughout each of the HFS. The researcher ran all the actual HFS following a sequential script and utilizing cues to maintain consistency between the student groups. Faculty trained in debriefing used a set of questions specific for the study to ensure consistency during debriefing.

Also, simulation roles were randomly assigned utilizing scripts to ensure consistency during each HFS group. The wife of the patient was simulated by a faculty member to ensure uniformity and to avoid inconsistencies during the HFS. Despite efforts of consistency regulation by the researcher and nursing faculty, student reactions and responses during the simulation varied, causing slight variation in each HFS. This is expected and may have allowed for different learning experiences during the simulation impacting results of the study.

Another limitation identified during the study was unexpected technical difficulty not allowing for video-feedback during debriefing. This may have negatively impacted the learning that occurred during debriefing. Future HFS should ensure that instructional technology support is available on-call to problem solve technical difficulty. Due to conducting the research at a small university, very limited technical support and resources were available due to budgetary reasons. Ideally, a trained simulation specialist would staff the simulation lab to ensure that technical issues could be resolved.

A final limitation identified by the researcher is that the study only looked at the perceptions of pre-licensure senior level nursing students, not analyzing perceptions of licensed nurses, patients or faculty members. Only the perceptions of pre-licensure nursing students were obtained during the study, limiting the results to students enrolled in one level of nursing education. Including perceptions from other healthcare professionals could provide further insight into how using HFS with an HIV positive patient impacts other healthcare professionals' knowledge and self-efficacy.

Future Research

Future research should include replicating this study at multiple universities, which would increase sample sizes and variation of participants. A control group with an experimental

design should be incorporated in future replications of this study to ensure the most reliable evidence regarding the cause and effect of the HFS (Polit & Beck, 2017). Future replications of this study should include adapting the GSES to allow for the measurement of nursing student self-efficacy specific to caring for an HIV patient. This will allow for more specific measurement of self-efficacy in relationship to student perceptions regarding caring for a patient with HIV. In addition, student evaluations of the HFS could be administered at the end of the study to gain further insight into student likes, dislikes, and recommended changes for future simulations. This would allow for changes to be made to the HIV HFS based on direct student feedback.

Based on common nursing student misconceptions and fear regarding HIV, future research studies should focus on measuring nursing student attitudes and perceptions regarding caring for HIV positive patients. These measurements could be conducted before and after delivery of an HFS simulation to see if student perceptions for caring for this type of patient did, in fact, change. Additional research exploring student perceptions is needed based upon past studies indicating that nursing students who have no experience with HIV patients tend to have negative perceptions and fear contracting the disease due to lack of knowledge and misconceptions (Lui et al., 2014; Nazik et al., 2012; Ouzouni & Nakakis, 2012). Using the *AIDS Attitudes Scale* (AAS) may be one option of implementing this. The AAS is a 15-item instrument developed to explore nursing and medical students' perceptions regarding fear of contagion, negative emotions, and professional resistance (Nazik et al., 2012). Exploring student perceptions and attitudes regarding caring for HIV positive patients could help identify specific gaps in nursing student knowledge that need to be included in future HIV simulations.

In addition, future research studies should utilize standardized tools to assess student knowledge levels regarding HIV. Examples of these tools include the *AIDS Education Information Questionnaire,* which assesses how the disease is transmitted, testing measures, and treatment interventions. In addition, the *AIDS Education Questionnaire* measures competency, and attitudes about caring for HIV-positive patients (Earl, 2010). The HIV knowledge questionnaire is another valid tool that measures knowledge over transmission and prevention of the disease (Lui et al., 2012). Utilizing one of these standardized tools to test nursing students' HIV knowledge in future studies will ensure all key HIV education concepts are measured and will allow the researcher to easily compare results to other studies. Utilizing a standardized tool to measure nursing student knowledge will enable the researcher to compare nursing student knowledge of HIV to other disciplines within healthcare such as occupational therapy and physician assistant students. These results will help identify the need for development of interdisciplinary HIV simulations with nursing students and students from other medical fields.

Lastly, future research studies should explore how HFS influences nursing students' clinical judgment in caring for HIV positive patients utilizing HFS or standardized patients as a teaching tool. More research needs to be conducted focusing on how HFS with an HIV positive patient affects nursing students' clinical judgment. Research could focus on assessing student clinical judgment during the actual HFS with an HIV positive patient utilizing Lasater's (2007) *Clinical Judgment Rubric* to evaluate their performance. Lasater's (2007) rubric would allow the researcher to evaluate each individual student's clinical judgment based on their behaviors and responses during the simulation. The rubric would allow the researcher to measure how the student interprets patient data, seeks information, and prioritizes patient needs (Lasater, 2007). Components of the rubric also rank student confidence, communication, and skill level, allowing

for a thorough formative assessment of student clinical judgment and gaps in learning (Lasater, 2007). The development of nursing students' clinical judgment in caring for an HIV positive patient is important to ensure students graduate nursing school prepared to effectively and safely care for this type of patient.

Summary

This quasi-experimental study provided further insight into how HFS impacts senior level nursing student knowledge and self-efficacy regarding HIV. Results of this study have added to past research supporting the use of HFS as a teaching method that is effective in increasing nursing student self-efficacy. Furthermore, results of this study have highlighted the need for HFS with HIV patients to be implemented into nursing curriculums to provide experience to students who have never cared for this type of patient, directly increasing student knowledge. It is apparent that nurse educators are faced with the challenge of preparing nursing students to care for patients with complex medical needs such as HIV, and using HFS as a teaching strategy has been found to be one effective modality of teaching to help with this challenge.

Future replications of this study need to be done to further explore the value of HFS as a teaching method to increase nursing student knowledge and self-efficacy in caring for HIV positive patients. Utilization of standardized tools to measure nursing students' HIV knowledge should be incorporated into future studies to enable comparison of nursing students' knowledge of HIV with other healthcare professions. This key research will provide insight into the need for development of interdisciplinary HIV simulations in the future. Exploring how HFS impacts nursing students' clinical judgment during HFS with an HIV positive patient is another area of need in future research. This research will help identify nursing students' clinical judgment responses during HFS, identifying needs for further teaching.

Nurse educators should spend time identifying where an HIV simulation would best fit into their individual program curriculum. Simulation would be created based on course objectives and individual program resources available. The *Pathway to Implementing an HIV Simulation* (Figure 5) will provide educators with the basic steps needed in this development. HFS needs to be integrated throughout nursing programs to facilitate the development of nursing student self-efficacy and foster connections of theoretical HIV knowledge to practice, while providing valuable learning experiences.

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Appendix A: Pretest-Posttest 25-item Multiple Choice Questions

1. An HIV positive patient is not adhering to the prescribed medication therapy. Which of the following actions by the nurse will best improve patient compliance and long-term treatment of the disease process?
A) Confront the patient about the noncompliant behavior.
B) Explore with the patient about not adhering to the medication schedule.
C) Suggest that the patient take the medication at bedtime to prevent nausea.
D) Refer the patient to a social worker so that lower-cost medications can be obtained.

2. A primary reason the immune response fails to contain HIV infection is that:
A) CD8+ T cells are stimulated and suppress B lymphocyte activity.
B) B lymphocytes are inactivated, so there are no HIV antibodies.
C) activated CD4+ T cells are infected and support HIV replication.
D) monocytes ingest infected cells, then shed the virus in tissues.

3. By which routes can HIV be transmitted? **(Select all that apply).**
A) Vector
B) Sexual
C) Parenteral
D) Airborne
E) Perinatal

4. A patient asks why they have to take multiple antiretroviral agents. They best nurse response would be?
A) "I wouldn't' complain too much, the doctor could prescribe more".
B)" The best way to suppress the virus is to take multiple types of medications".
C)" Drug companies really like to make you pay more and take unnecessary medications".
D)" The goal of the antiretroviral agents is to increase your viral load and multiple types are needed".

5. Which population of people has the highest incidence of HIV?
A) Caucasian females
B) African American males
C) Hispanic females
D) Asian males

6. A nurse is aware that standard precautions include which of the following? **(Select all that apply)**

A) Washing hands immediately after contact with blood or body fluids.
B) Use "needless" IV systems whenever possible.
C) Wear sterile gloves to protect hands.
D) Always recap needles after usage.
E) Don gown upon entering patient rooms.

7. A nurse should instruct a distraught wife of a recently diagnosed HIV positive patient to do which of the following?

A) Attend a medication teaching session to ensure that they can help their husband with meds.
B) Make an appointment with an HIV counselor so they have someone to talk to.
C) Get tested for the HIV virus immediately and begin pre-exposure treatment.
D) Attend a support group for spouses at the local HIV outreach program.

8. Which of the following side-effects of antiretroviral drugs is important to teach patients to report to their health care provider?

A) Periodic nausea
B) Increased tiredness
C) Increased headaches
D) Yellowing of the skin

9. You are teaching a patient regarding the evaluation of therapy. After beginning antiretroviral therapy when will they need to have their viral load measured again?
A) 4- 6 months
B) 6-8 weeks
C) 1-2 weeks
D) 6- 8 months

10. Opportunistic diseases develop in AIDS because these disorders are

A) Side effects of drug treatment of AIDS.
B) Sexually transmitted to individuals during exposure to HIV.
C) Characteristic in individuals with stimulated B and T lymphocytes.
D) Infections or tumors that rarely occur with a competent immune system.

11. The nurse is describing the HIV virus to a client who has been told he is HIV positive. Which information regarding the virus is important to teach?

A) The HIV virus can be eradicated from the host body with the correct medical regimen.
B) The HIV virus is a retrovirus, which means it never dies as long as it has a host to live in.
C) It is difficult for the HIV virus to replicate in humans because it is often found in animals.
D) The HIV virus uses the client's own red blood cells to reproduce the virus in the body.

12. The nurse is teaching a group of students about HIV infections. In discussing the "window period", the nurse explains it is the time between:
A) Starting antiretroviral therapy and an increased CD4 count.
B) Antiviral vaccine and the development of immunity.
C) Exposure to the virus and start of post exposure prophylaxis.
D) Contraction of the virus and seroconversion.

13. Four years after seroconversion, an HIV-infected patient has a CD4 T cell count of 800/mm3 and a low viral load. The nurse recognizes that at this time:

A) The patient is at risk for development of opportunistic infections because of CD4 T cell destruction.
B) Anti-HIV antibodies by B-cells enter CD4 T cells and stop replication of viruses in the cells.
C) An adequate number of CD4-T cells are produced to have a normal immune response to infections.
D) The patient is in a critical period during which very few virus cells are being replicated.

14. A patient who is HIV positive asks the nurse, "Will I be capable of transmitting the virus to others?" What is the nurse's best response?
A) "If your CD4 T-cells drop below 200/mm3 you would be considered infectious."
B) "At this stage, you can only transmit the virus through donation of blood or blood products."
C) "It is highly unlikely to transmit the virus as long as you take your medications and the virus is undetectable".
D) "The virus can be only be transmitted in the early stage and late stage of HIV."

15. You are teaching a newly diagnosed HIV patient regarding their medication regimen. What is the most important thing to teach them?
A) Take medications the same time daily
B) Times can fluctuate due activities of daily living
C) Ensure that all health care providers know what medications you are currently taking
D) Medications work effectively no matter what time they are taken

16. Which of the following would be considered a significant exposure from a patient with HIV?
A) Your intact skin comes in contact with blood.
B) You touch a large amount of fecal matter.
C) Your clothing becomes soiled with a large amount of vomitus.
D) You splash serosanguinous fluid in your eye from a jackson-pratt drain.

17. The nurse is teaching an HIV positive client regarding Epzicom. Which of the following adverse effects should they include in their teaching plans?
A) fast irregular heartrate
B) Decreased blood glucose levels
C) Increased thirst at night
D) Increased muscle relation

18. Which suggestion would the nurse give to a HIV patient to alleviate nausea?

A) Drink liquids with meals
B) Eat a high-fat diet
C) Eat small, frequent meals
D) Lying flat after eating

19. The nurse looks for results of which laboratory measure that provide a reliable indicator of lymphocyte status in a client with HIV infection?

A) B lymphocytes
B) T-helper cells (CD4)
C) Natural killer cells (NK)
D) T-cytotoxic cells

20. An HIV positive patient asks what drug resistance is. The best response by nurse would be:

A) The ability of medications to resist strong disease pathogens in the blood stream.
B) Pathogens can withstand the effects of medications that should be toxic to them.
C) Genetic mutation of the disease due to exposure to other pathogens.
D) Drug resistance is when drugs become toxic to patients with HIV.

21. The nurse is assessing a 36-year-old man with HIV who has been admitted with pneumonia. In assessing the patient, which of the following observations takes immediate priority?
A) Oral temperature of 102°F
B) HR of 118 and restlessness
C) Frequent loose stools
D) BP 172/80 with SP02 of 92%

22. The nurse is caring for a patient with HIV. Which activity by the nurse should be reported to occupational health as an exposure for the nurse?
A) The nurse does not wear a mask when entering the room.
B) During the bath, the nurse removed gloves when giving a back rub.
C) The nurse has a needle poke when using a sterile syringe to draw up the patient's medications.
D) During irrigation of a wound, fluids splash in the nurse's eye.

23. The patient with HIV developed a reddened blister due to frequent episodes of diarrhea. Identify the appropriate nursing intervention.
A) Rub the skin directly over the blister to enhance circulation.
B) Open and drain blister.
C) Apply heat to the area three times daily until healed.
D) Encourage ambulation to increase circulation and maintain muscle tone.

24. An at-risk patient who was recently exposed to HIV, tested negative for the HIV antibodies asks why the doctor instructed to repeat the test in 3 months if she is negative. The nurse's best response is:

A) During initial infection of HIV, the body will not produce antibodies and results will be negative.
B) The first antibody test often is inaccurate and a second test is needed for confirmation.
C) The virus is very slow to replicate in the beginning and cannot be found in the blood.
D) Antibodies are not released into the blood stream until 3 months after initial exposure.

25. A patient is newly diagnosed with early HIV infection. The family is very concerned about his care and risk for infection to other family members. What is the most appropriate action by the nurse to promote coping at this time?

A) Show the family how to wash their hands appropriately.
B) Explain the side effects of prophylactic medications that will prevent the virus.
C) Demonstrate positive acceptance of the patient with each contact.
D) Clearly explain the pathophysiology of the disease to the family.

Appendix B: Generalized Self-Efficacy Scale

1 = Not at all true 2 = Hardly true 3 = moderately true 4 = exactly true Answer

1. I can always manage to solve difficult problems if I try hard enough. _____
2. If someone opposes me, I can find the means and ways to get what I want. _____
3. It is easy for me to stick to my aims and accomplish my goals. _____
4. I am confident that I could deal efficiently with unexpected events. _____
5. Thanks to my resourcefulness, I know how to handle unforeseen situations. _____
6. I can solve most problems if I invest the necessary effort. _____
7. I can remain calm when facing difficulties because I can rely on my coping abilities. _____
8. When I am confronted with a problem, I can usually find several solutions. _____
9. If I am in trouble, I can usually think of a solution. _____
10. I can usually handle whatever comes my way. _____

Schwarzer, R., & Jeruselam, M. (2016). Generalized Self-Efficacy scale. Retrieved from http://userpage.fu-berlin.de/~health/engscal.htm

Appendix C: Permission to Use General Self-Efficacy Scale

Freie Universität Berlin

Fachbereich Erziehungs-
wissenschaft und Psychologie
- Gesundheitspsychologie -

Freie Universität Berlin, Gesundheitspsychologie (PF 10),
Habelschwerdter Allee 45, 14195 Berlin, Germany

Professor Dr. Ralf Schwarzer
Habelschwerdter Allee 45
14195 Berlin, Germany

Fax +49 30 838 55634
health@zedat.fu-berlin.de
www.fu-berlin.de/gesund

Permission granted

to use the General Self-Efficacy Scale for non-commercial reseach and development purposes. The scale may be shortened and/or modified to meet the particular requirements of the research context.

http://userpage.fu-berlin.de/~health/selfscal.htm

You may print an unlimited number of copies on paper for distribution to research participants. Or the scale may be used in online survey research if the user group is limited to certified users who enter the website with a password.

There is no permission to publish the scale in the Internet, or to print it in publications (except 1 sample item).

The source needs to be cited, the URL mentioned above as well as the book publication:

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp.35-37). Windsor, UK: NFER-NELSON.

Professor Dr. Ralf Schwarzer
www.ralfschwarzer.de

Appendix D: Recruitment letter

(To be given to in person)

Dear senior level nursing student,

As you may or may not know I am a doctoral student at the College of Saint Mary perusing my Ed.D. Degree with an emphasis in Health Profession Education. I am currently beginning my research towards my dissertation. My dissertation study is a quasi-experimental research design using tools that measure knowledge and self-efficacy before and after a simulation with an HIV patient. My purpose is to determine if using simulation as a teaching tool increases nursing student knowledge and self-efficacy with caring for an HIV positive patient.

I am writing you to participate in this study. I believe you would be an excellent fit for this study. My goal is to improve nursing education for future students. I would like to review the requirements and time commitments for this study with you. After obtaining written consent from you, you will be asked to complete several pretests. Next, after your scheduled simulation you will complete several posttests. You will receive a $5 gift card to Christina's once you have completed the study. I am willing to meet with you to provide more details regarding the study and answer any questions you may have.

Sincerely,

Jamie L. Hilderbrand Ed.D (C), RN

7000 Mercy Road Walsh 461

Omaha, NE 68106

(402) 399-2604

Attachment E: Informed Consent

ADULT CONSENT FORM

Title of this Research Study. IMPACT OF SIMIULATION ON NURSING STUDENTS' KNOWLEDGE AND SELF EFFICACY RELATED TO HIV

You are invited to take part in this research study. The information in this form is meant to help you decide whether to take part. If you have any questions, please ask.

Why are you being asked to be in this research study? You are being asked to be in this study because you are a senior level student in the Bachelor of Science in nursing program that is enrolled in the Multisystem nursing course at a Midwestern private Catholic University.

What is the reason for doing this research study?

Student self-efficacy has been closely linked with clinical judgment and nursing student success within the clinical setting and research has shown that high fidelity simulation (HFS) as a teaching tool increases student self-efficacy and nursing knowledge. The purpose of this research study is to identify if using HFS as a nursing education teaching strategy improves senior level nursing students' knowledge of HIV and self-efficacy by asking the following questions (1). What is the impact of HFS on BSN student's ability to answer knowledge based NCLEX style questions regarding HIV and (2). What is the impact of HFS as a teaching strategy on BSN student's self-efficacy levels when caring for a simulated HIV positive patient as measured by the General Self-Efficacy Scale (GSES)?

What will be done during this research study?

The researcher will collect informed consent and deliver *The Rights of Research Participants* to you. After addressing any concerns and collecting appropriate signatures, the following will occur:

- Participants will complete a 25-item NCLEX style exam and the *General Self-Efficacy Scale.*
- Following debriefing during the scheduled simulation day, participants will be administered the same 25-item multiple choice exam and the *General Self-Efficacy Scale.* Upon completion, you will be finished with the study.

Participant Initials _____

ADULT Consent Form - PAGE TWO

What are the possible risks of being in this research study?
There are no known risks to you from being in this research study.

What are the possible benefits to you?
The benefits of this study may be increased knowledge and self-efficacy regarding caring for HIV patients. However, you may not get any direct benefit from being in this research study.

What are the possible benefits to other people?
Possible future benefits include improving nursing education methods using simulation as a teaching tool. Also, the possibility of improving future nursing student's knowledge and self-efficacy based on the results of this study.

What are the alternatives to being in this research study?
Instead of being in this research study you can choose not to participate.

What will being in this research study cost you?
There is no cost to you to be in this research study.

Will you be paid for being in this research study?
You will not be paid or compensated for being in this research study.

What should you do if you have a concern during this research study?
Your well-being is the major focus of every member of the research team. If you have a concern as a direct result of being in this study, you should immediately contact one of the people listed at the end of this consent form.

How will information about you be protected?
Reasonable steps will be taken to protect your privacy and the confidentiality of your study data. The participants in this research study will be known to the researcher, but to ensure anonymity all data collected will be collected anonymously and kept confidential.

All electronic materials related to the study will be kept on the researcher's password protected computer. All other documents and any external computer drives will be kept in a locked filing cabinet in the researcher's office; only assessable to the researcher. All simulation video recordings will be deleted after each data analysis is completed. Any discussions with the participants regarding the study will be kept confidential by the researcher. Upon completion of the study all materials will be kept secure, as described above, for three years and then destroyed by the researcher. The only persons who will have access to your research records are the study personnel, the Institutional Review Board (IRB), and any other person or agency required by law. The information from this study may be published in scientific journals or presented at scientific meetings but your identity will be kept strictly confidential.

Participant Initials _____

ADULT Consent Form - PAGE THREE

What are your rights as a research participant?

You have rights as a research participant. These rights have been explained in this consent form and in *The Rights of Research Participants* that you have been given. If you have any questions concerning your rights, talk to the investigator or call the Institutional Review Board (IRB), telephone (402)-399-2400.

What will happen if you decide not to be in this research study or decide to stop participating once you start?

You can decide not to be in this research study, or you can stop being in this research study ("withdraw") at any time before, during, or after the research begins. Deciding not to be in this research study or deciding to withdraw will not affect your relationship with the investigator, or with the College of Saint Mary.

If the research team gets any new information during this research study that may affect whether you would want to continue being in the study, you will be informed promptly.

Documentation of informed consent.

You are freely making a decision whether to be in this research study. Signing this form means that (1) you have read and understood this consent form, (2) you have had the consent form explained to you, (3) you have had your questions answered, and (4) you have decided to be in the research study.

If you have any questions during the study, you should talk to one of the investigators listed below. You will be given a copy of this consent form to keep.

If you are 19 years of age or older and agree with the above, please sign below.

Signature of Participant: _____Date:_____Time:_____

Participant Initials _____

ADULT Consent Form - PAGE FOUR

My signature certifies that all the elements of informed consent described on this consent form have been explained fully to the participant. In my judgment, the participant possesses the legal capacity to give informed consent to participate in this research and is voluntarily and knowingly giving informed consent to participate.

Signature of Investigator: _____Date:_____

Authorized Study Personnel.

Principal Investigator: Jamie Hilderbrand Ed.D. (C), RN, Phone: (402) 641-2534
Secondary Investigator: Virginia Tufano Ed.D., RN, Phone: (402) 384-5299
7000 Mercy Road • Omaha, NE 68106-2606 • 402.399.2400 • FAX 402.399.2341 • www.csm.edu

Appendix F: Rights of Research Participants

COLLEGE OF SAINT MARY

THE RIGHTS OF RESEARCH PARTICIPANTS*

AS A RESEARCH PARTICIPANT AT COLLEGE OF SAINT MARY

YOU HAVE THE RIGHT:

1. TO BE TOLD EVERYTHING YOU NEED TO KNOW ABOUT THE RESEARCH BEFORE YOU ARE ASKED TO DECIDE WHETHER OR NOT TO TAKE PART IN THE RESEARCH STUDY. The research will be explained to you in a way that assures you understand enough to decide whether or not to take part.
2. TO FREELY DECIDE WHETHER OR NOT TO TAKE PART IN THE RESEARCH.
3. TO DECIDE NOT TO BE IN THE RESEARCH, OR TO STOP PARTICIPATING IN THE RESEARCH AT ANY TIME. This will not affect your relationship with the investigator or College of Saint Mary.
4. TO ASK QUESTIONS ABOUT THE RESEARCH AT ANY TIME. The investigator will answer your questions honestly and completely.
5. TO KNOW THAT YOURE SAFETY AND WELFARE WILL ALWAYS COME FIRST. The investigator will display the highest possible degree of skill and care throughout this research. Any risks or discomforts will be minimized as much as possible.
6. TO PRIVACY AND CONFIDENTIALITY. The investigator will treat information about you carefully and will respect your privacy.
7. TO KEEP ALL THE LEGAL RIGHTS THAT YOU HAVE NOW. You are not giving up any of your legal rights by taking part in this research study.
8. TO BE TREATED WITH DIGNITY AND RESPECT AT ALL TIMES.

THE INSTITUTIONAL REVIEW BOARD IS RESPONSIBLE FOR ASSURING THAT YOUR RIGHTS AND WELFARE ARE PROTECTED. IF YOU HAVE ANY QUESTIONS ABOUT YOUR RIGHTS, CONTACT THE INSTITUTIONAL REVIEW BOARD CHAIR AT (402) 399-2400. *ADAPTED FROM THE UNIVERSITY OF NEBRASKA MEDICAL CENTER, IRB WITH PERMISSION.

Appendix G: Pre-Simulation Assignment

Learning objectives of Simulation:

- Demonstrate correct assessment techniques for an HIV positive patient
- Provide appropriate teaching to a patient regarding the modes of transmission of HIV
- Demonstrate appropriate use of equipment and safety devices
- Demonstrate effective therapeutic and professional communication techniques when interacting with the patients, family members, and healthcare team
- Incorporate family into the care of a HIV positive patient
- Recognize appropriate tasks to delegate to unlicensed personnel for effective management of patient care
- Utilize appropriate standard precautions while caring for a simulated HIV positive patient
- Provide appropriate teaching regarding new medication to a simulated HIV positive patient.

Pre-Simulation Assignment

1. Utilizing your text book and lecture material from class review the following content areas:
    a. Pathophysiology of the HIV virus
    b. Modes of transmission of the HIV
    c. Nursing care of the HIV positive patient
    d. Medications used to treat HIV
        i. Epzicom
        ii. Tivicay
        iii. Lamivudine (3TC) 300 mg

    e. Laboratory tests related to the disease

2. Plan to arrive at your simulation session 5 minutes early and dressed in your clinical uniform.
3. Items to bring:
    a. Pen
    b. Stethoscope
    c. Drug Guide
    d. Lab Book

Appendix H: Demographic Questions

1. What is your current age?
2. Have you ever cared for a HIV positive patient?

Appendix I: Debriefing Questions

1. How did you feel throughout the HIV simulation?
2. What did you learn from the HIV simulation?
3. What did the group do well?
4. Which parts of the simulation could have gone better?
5. Identify some of the safety issues you recognized in the simulation in regard to HIV?
6. What populations of people are at greatest risk for HIV?
7. When do patients need to have their labs re-checked after starting antiretroviral therapy?
8. What are some opportunistic diseases that this patient may be at risk for in the future?
9. How do you feel regarding your ability to care for patients with HIV in the future?
10. Do you think this simulation will help you to successfully care for an HIV positive patient in the future?
11. Did you meet the objectives of the simulation?
12. Where there any objectives that you did not meet?

Adapted from Jeffries, P. R., & Rogers, K.J. (2007). Reflective thinking and debriefing questions. In P. Jeffries (Ed.) *Simulation in nursing education* (p. 30). New York: National League for Nursing.

Appendix J: HIV Simulation Scenario

Level of Learner: Senior Level Nursing Students

Learning Objectives:

1. Demonstrate correct assessment techniques for an HIV positive patient
2. Provide appropriate teaching to a patient regarding the modes of transmission of HIV
3. Demonstrate appropriate use of equipment and safety devices
4. Demonstrate effective therapeutic and professional communication techniques when interacting with the patients, family members, and healthcare team
5. Incorporate family into the care of a HIV positive patient
6. Recognize appropriate tasks to delegate to unlicensed personnel for effective management of patient care
7. Utilize appropriate standard precautions while caring for a simulated HIV positive patient
8. Provide appropriate teaching regarding new medication and pathophysiology to a simulated HIV positive patient.

What pre-requisite knowledge is essential to this experience?

a. Pathophysiology of the HIV virus
b. Modes of transmission of the HIV
c. Nursing care of the HIV positive patient
d. Medications used to treat HIV
e. Laboratory tests related to the disease

Equipment needed:
IV pump
IV fluids NACL
Dressing and burn wound on left leg
Clothes for wife
Phone
HIV teaching material packet
Patient Chart
Epzicom (Abacavir 600 mg/Lamivudine 300 mg) PO
Dolutegravir 50 mg PO daily
Atorvastatin 40 mg PO daily
Lamivudine (3TC) 300 mg PO daily

HIV Patient Situation:

Patient is a 47-year-old male admitted to the hospital after a motorcycle accident and has a large-pavement burn on his left leg. Patient reported on admission to the Emergency Department of having a past history of IV drug use. He states, "I got clean 2 years ago when I met my wife". CBC, BMP, UA, and an HIV antibody screening was completed upon admission. Results indicate that the patient is HIV positive. The MD delivered the news to the patient and ordered a genotype before starting medications. It is 0800 and you're beginning your shift. A referral is made to infectious disease consult from Dr. Theodore and will be visiting the patient, as well, this morning. In the meantime, labs were sent over to Dr. Theodore's office and he will be calling back with orders.

Frame 1: (0700)
Students arrive for shift report and get report from night nurse
Nurse Report:
S- Pt diagnosed with HIV last week. Continues to deal with pain in his right leg due to wound. Dressing clean, dry and intact. VSS. Just pressed call light for pain medication.
B-Last pain med at 0355
A-Pain assessment needed
R-Needs f/u regarding pain medication

What does the Patient look like?
0800 Patient remains distraught and in total disbelief of his new diagnosis. He anxiously waits to hear what medications he will have to start taking. He has severe pain in his right leg, secondary to his burn. His wife is very scared and cries at the bedside. His wife has not left his side since admission. His leg dressing is saturated and needs changed.

Nursing Actions Expected:
Introduction to patient and wife
Begin head to toe assessment
Take VS
Assess pain level and provide pain management
Change leg dressing, as ordered
Review plan of care with patient

VS: BP 189/98
HR 102
R 24
T 36.6
O2 stats 97% RA

Abnormal Lab or Other Diagnostic Results:

CD 4+ 300 cells/mm3
HIV RNA 110,000 copies/mL
HIV Genotype (In chart)
Total Cholesterol 239 mg/dL
LDL 159 mg/dL
HDL 62 mg/dL
Triglycerides 488 mg/dL
HBsAg negative
anti-HBc negative

Frame 2: Patient and wife sit quietly in the room.
VS: BP 168/72
HR 98
R 22
T 36.6
02 stats 98% RA
Pain level: 5/10 In Left Leg
Lung sounds: Clear
Bowel Sounds: Active

Nursing Actions Expected:
Complete head to assessment
Utilize universal precautions
Further Assess pain level and provide pain management
Utilize therapeutic communication with patient and family
Student encourages wife to be tested for HIV

Dr. Theodore calls with new orders.
Infectious Disease Orders per telephone:
Abacavir (ABC) 600 mg PO daily
Lamivudine (3TC) 300 mg PO daily
Dolutegravir 50mg PO daily
Atorvastatin 40 mg PO daily
Teaching regarding HIV disease, medications, and modes of transmission

Frame 3: Patient asks nurse questions regarding HIV and how much time he has to live. Questions focus on the HIV virus and medications.

VS: BP 152/77
HR 88
R 18
T 36.6
02 stats 97% RA
Pain Level: 3/10 in L leg

Nursing Actions Expected:
Reassess patient's pain level
Prepare to administer new medications
Administer medications, as ordered
Continue teaching regarding the HIV virus
(Teaching Materials at Bedside)
Teach patient and wife regarding new medication regimen

Frame 4: Patient education is complete and nurses leave the room. Patient is left reading over materials with wife.

VS: BP 140/76
HR 78
R 20
T 36.6
O2 stats: 98% RA
Pain Level: 2/10 in L leg

Nursing Action Expected:
Ask patient and wife if they have any further questions
Ensure that the call light is in reach of patient and all safety needs are addressed

How many facilitators are required for this experience: 3-4

What are their roles?
Orientation to SIM room
Assign roles to students
Run simulation
Role of wife
Debrief after simulation complete

How long should the scenario last? 20-30 minutes

How long should the debriefing last? 30 minutes

What is the maximum number of learners that can participate in each group: 8

Will there be observers: Yes

Student Roles:

Primary Nurse
New Graduate Nurse
Documentation Nurse
Wife of Patient (Faculty)
Medication Nurse
Observer of Primary Nurse
Observer of New Graduate Nurse
Observer of the Medication Nurse
Observer of the Documentation Nurse

Appendix K: Letter Requesting Permission to Nursing Program Director

Jamie L. Hilderbrand Ed.D (C), MSN, RN
1149 Bemis Drive
David City, NE
68632

July 15, 2016

Dr. Christi Glessman
College of Saint Mary
7000 Mercy Rd.
Omaha, NE
68632

Dear Dr. Glesmann,

I am writing you this letter to request permission to contact students enrolled in the NUR 303 during spring 2017 for completion of my dissertation work. Students will be asked to participate in a pre-posttest quasi-experimental research study including a simulation with an HIV positive patient. During the study I will measure nursing students' self-efficacy using the *Generalized Self-Efficacy Scale* and nursing knowledge regarding HIV using a 25-item NCLEX style tool. I have included with this letter my research proposal for you to review and find out more information regarding my study. Please feel free to contact me if you have any questions. Thank you for your consideration.

Sincerely,

Jamie Hilderbrand

Jamie L. Hilderbrand Ed.D (C), MSN, RN

Appendix L: Letter of Permission from Program Director:

COLLEGE OF SAINT MARY

July 20, 2016

Jamie Hilderbrand
1149 Bemis Drive
David City, NE 68632

Dear Ms. Hilderbrand,

Please consider this letter as documentation of my approval of your request to conduct research in the Bachelor of Science in Nursing program at College of Saint Mary. Your project topic of self-efficacy in nursing students sounds like a very interesting and helpful study and I wish you the best as you complete this study. If there are any questions, I am glad to respond to them.

Sincerely,

Dr. Christi Glesmann

Christi Glesmann, EdD, MSN, RN
Program Director, Undergraduate Nursing

7000 MERCY ROAD | OMAHA, NEBRASKA 68106
T 402-399-2400 | F 402-399-2341 | CSM.EDU

Appendix M: IRB Approval Letter

November 18, 2016

Dear Ms. Hilderbrand,

Congratulations! The Institutional Review Board at College of Saint Mary has granted approval of your study titled *Impact of Simulation on Nursing Students' Knowledge and Self Efficacy Related to HIV***.**

Your CSM research approval number is **CSM 1614**. It is important that you include this research number on all correspondence regarding your study. Approval for your study is effective through December 31, 2017. If your research extends beyond that date, please submit a "Change of Protocol/Extension" form which can be found in Appendix B at the end of the College of Saint Mary Application Guidelines posted on the IRB Community site.

Please submit a closing the study form (Appendix C of the IRB Guidebook) when you have completed your study.

Good luck with your research! If you have any questions or I can assist in any way, please feel free to contact me.

Sincerely,

Vicky Morgan

Dr. Vicky Morgan
Director of Teaching and Learning Center
Chair, Institutional Review Board * irb@csm.edu