

Comparing Teaching Strategies Utilized to Enhance Self-Confidence Among
Novice Nursing Students

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Abstract

Faculty play a considerable role in positively impacting the development of a novice nursing student's self-confidence through contemporary, innovative, and meaningful teaching practices that are data-driven. Employing effective confidence-building teaching strategies early in the curriculum supports the development of confidence as a professional attribute and is critical to student success, patient safety, and patient comfort (Blum et al., 2010; Bulfone et al., 2016; Lundberg, 2008; White, 2009). This prospective, cross-sectional, quantitative, comparison pilot study compared the effectiveness of a role-play (RP) physical assessment simulation with a new teaching strategy, an individual high-fidelity physical assessment simulation (HFS), to determine the impact on beginning associate degree nursing students' self-confidence. Grundy's (1993) Confidence Scale was utilized to measure student perceived levels of self-confidence prior to the simulation and one week later prior to engaging in their first patient care experience. An independent samples *t*-test ($p = .11$) revealed there was no statistically significant difference in post-intervention levels of total self-confidence between the simulation groups. However, paired samples *t*-tests within groups revealed statistically significant changes in total levels of confidence from Time 1 ($M= 18.4, SD= 2.70$) to Time 2 ($M= 20.3; SD= 2.30$), $t(15) = -3.50, p = .003$ (two-tailed) in the RP group. The mean change in confidence levels was 1.90 with a 95% *CI* ranging from -3.02 to -.73, with a large effect size (0.45). Limitations included a small, homogenous, convenience sample ($n =16$ per simulation group). Further exploration of both teaching strategies at this research site is recommended.

Keywords: beginning, nursing student, confidence level, role-play, high-fidelity simulation

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SECTION I: INTRODUCTION

Adult learners come into nursing programs with previous life experiences that can influence their future success. For educators working with these students early in the nursing program, one of the greatest challenges can be in addressing students' self-confidence. Self-confidence can be promoted through self-efficacy or a belief in one's own ability to accomplish certain tasks and achieve specific goals (Bulfone et al., 2016; Van Horn & Christman, 2017). This concept has been identified in education as a "factor promoting learning, motivation, performance, and success, as well as a factor in preventing stress and health-related problems" (Bulfone et al., 2016, p. E1). High levels of self-confidence in students have also been associated with academic success and an ability to persevere when faced with academic challenges (Bulfone et al., 2016). Nurse educators may identify a lack of self-confidence as a determinant for a 'high-risk' student; it is imperative that these educators employ effective confidence-building teaching strategies early to increase the likelihood for student success (Lundberg, 2008). Lundberg also asserts that clinical confidence cannot be learned in the classroom, but rather confidence builds when mastery of skills or success is experienced (Lundberg, 2008).

Patient safety is of utmost importance in nursing education. Teaching nursing skills to assist students in integrating the cognitive, affective, and psychomotor skills is a complex process (O'Brien, Talbot & Santevecchi, 2015). The overall goal of prelicensure nursing programs is to graduate confident students prepared to provide safe, competent patient care. Finding ways to create opportunities for students to translate the knowledge and skills learned in the classroom and skills laboratory to the clinical setting is critical (Goodstone et al., 2013).

Failure to create these learning opportunities can have negative implications for patient safety while students are working in the clinical setting and in the student's future practice.

According to Owen, Coburn, Garbett, and Amar (2017), simulation is known to be an effective teaching strategy in prelicensure nursing programs. When innovative teaching strategies are used, students feel greater motivation to perform at a higher level as compared to traditional teaching methods (Owen et al., 2017). Nursing faculty must investigate these innovative teaching strategies to determine its usefulness within their own nursing program as the potential for increasing the self-confidence of students can positively impact both student and patient outcomes.

The purpose of this prospective, cross-sectional quantitative comparative Doctor of Nursing Practice (DNP) study was to determine which confidence-building teaching strategy ~~is~~ was most effective in enhancing novice nursing students' confidence levels. Role-play simulation with learner/learner student pairs and high-fidelity simulation using a human patient simulator (HPS) were the teaching/learning strategies used for this project. Levels of confidence were measured using the Confidence Scale pre and post-simulation activity. The content contained in Section I will elucidate the background of the problem, provide review and summary of relevant literature, statement of the problem, and purpose of the project. Significance, nature, scope, and limitations of the project along with the theoretical framework, the definition of terms, and summary will be addressed. In Section II, the methodology is discussed to include project design, sample and setting, and instrumentation. Data collection, data analysis, data management methods, ethical considerations, internal and external validity, and summary will also be provided. This manuscript concludes with Section III which includes a

summation of the methods and procedures utilized during this study. Additional sample and setting characteristics along with the major findings are also included. The section closes with a discussion of the implications for nursing practice, recommendations, conclusions, and contributions to the profession of nursing.

Background of the Problem

Self-efficacy and self-confidence are terms that are difficult to separate due to their interchangeable use in the review of literature. Self-efficacy is a task-specific and goal-oriented belief in one's ability to successfully produce a desired outcome (Zulkosky, 2009). Self-efficacy creates a situational feeling of self-confidence and may be viewed as an antecedent for self-confidence to develop (Bandura, 1994; National Research Council, 1994). Self-confidence becomes an attribute that is sensed more globally and develops when the mastery of experiences and repeated successes occur (White, 2009). For novice nursing students, self-efficacy develops with each new skill or task learned and builds confidence with the accumulation of repeated successes. Self-confidence as a concept is important in nursing education as once it is acquired by a nursing student, outcomes such as student success and patient safety are more favorable.

According to Blum, Borglund, and Parcells (2010), self-confidence and competence are professional nursing attributes that help shape the growth of clinical decision-making and safe practice. Self-confidence and competence of the nurse can also have a positive impact on the trusting relationship between the nurse and patient. Clinical competence is formed by a nurse's ability to apply knowledge and skills needed for the given patient care situation and is influenced by the nurse's level of confidence (Blum, Borglund, & Parcells, 2010). Many factors

influence the confidence levels of nursing students. Previous life experiences to include academic experiences shape students' level of self-confidence and competence in dealing with everyday situations. However, for new nursing students entering health care, the complexities of the patient care environment present new situations and challenges that entry-level nursing students may find ill-equipped to handle (Blum et al., 2010). Internal and external influences of nursing students' confidence can be addressed by nursing faculty with careful planning. Nurse educators must work towards finding, employing, and then testing teaching-learning strategies that encourage the development of confidence and competence among nursing students (Blum et al., 2010). Confidence-building teaching strategies such as simulation and deliberate practice will be discussed.

Teaching Strategies

Evaluating teaching strategies or interventions used to increase students' self-confidence is important. Nurse educators are obligated to employ effective teaching strategies to improve students' abilities to meet course objectives, student learning outcomes (SLOs), program outcomes, and, ultimately, ensure students can provide safe, competent nursing care. Nurse educators teaching students early in the nursing program can help to instill confidence and develop a foundation for the attainment of knowledge and successful application of newly acquired skills (Lundberg, 2008).

According to Franklin, Gubrud-Howe, Sideras, and Lee (2015), "self-efficacy is a temporary and easy-to-influence belief that is situation specific" (p. 325). Recreating these easily influenced situations as a teaching strategy can help in the development of students' confidence. While having a high level of self-confidence does not always ensure learning or

behavior changes, utilizing confidence-building teaching strategies that allow for faculty to provide immediate feedback, opportunities for students to have deliberate practice of a skill or observe others perform a skill, and giving meaning to the context of the student's learning can lead to positive behavior changes in the student (Christian & Krumwiede, 2013; Franklin et al., 2015; Lundberg, 2008).

Traditional teaching methods involving lecture are passive in nature, not allowing students to truly engage in the learning process nor does it take into consideration the students' preference for learning (Thomas & Mackey, 2012). While this teaching strategy has been the mainstay in higher education, students are not able to achieve a deeper, more meaningful understanding of critical content needed to successfully meet course objectives (Hill, 2017). Active learning requires students to not only hear about key content but truly digest it and demonstrate application of the new knowledge, skills, and abilities (Hill, 2017). This requires higher order thinking skills to be put into action. Various types of simulation offer opportunities for students to become active in their learning.

Determining whether there is a measurable difference in elevating a students' self-confidence by utilizing an individual HFS experience or deliberate practice through role-play in learner/learner pairs prior to encountering their first patient care experience is important. Identifying clinical confidence early in the clinical rotation allows for educators to adjust the clinical experience to better fit the students' learning needs (Lundberg, 2008). Simulation provides an individualized learning experience that allows students to learn with confidence, cope with any outcomes that may arise, develop autonomy in clinical practice, and refine their skill set in a safe laboratory setting prior to entering a patient care setting (Peteani, 2004). The

exploration of determining which simulation activity is most effective in enhancing student self-confidence is a proactive approach in using the best teaching methods for instruction (Peteani, 2004).

Learning Strategy

Nursing faculty must learn to embrace innovation through simulation to better meet the learning needs and preferences of students. At the same time, students need to exert some control and actively engage in their learning experiences. Simulation provides full immersion into learning and has been identified as a learning strategy that appeals to students who prefer active learning rather than passive learning (Alfes, 2011). Active learning requires students to be fully engaged in the learning process, actively participate in the educational activity, and “respond to the learning situation” (Scheckel, 2012, p. 172). In contrast, passive learning tends to occur in the classroom environment whereby students learn by observing, listening to lectures, reading assignments, and viewing slideshow presentations (Scheckel, 2012). While observational learning can aid in learning, it is passive in nature (Thomas & Mackey, 2012).

Simulation appeals especially to students that are digital natives (Alfes, 2011). Digital natives are those students born between 1980 and 2000 who have always embraced technology as a way of life. Students that embrace simulation, often a technology-driven learning strategy, find enjoyment in learning, experience success in the simulation activity, and may find their level of confidence increases when encountering a similar patient care experience (Alfes, 2011). At this site for the proposed research study, more than 82% of new students enrolled would be classified as digital natives (Ivy Tech Community College, 2016).

Based upon their age classification as digital natives, these students are more likely to find the appeal to learning with simulation as the teaching strategy.

Stress, Anxiety, and Student Success. Prelicensure nursing students, especially those preparing for their first clinical experience, report lack of self-confidence and fear about their ability to meet performance expectations in the clinical rotation (Dearmon et al., 2013). This lack of self-confidence can negatively impact a student's ability to learn the role of the professional nurse, meet personal learning goals, and lead to attrition in the nursing program (Dearmon et al., 2013; Williams, 2010). High levels of stress and anxiety along with decreased self-confidence can lead to students experiencing failure and an inability to apply knowledge and skills into practice.

Students with an increased level of self-confidence are more likely to find success in meeting clinical goals (Lundberg, 2008). As repeated exposure to a situation occurs or experience is gained from a clinical experience, so does self-confidence (Thomas & Mackey, 2012). Nursing students require self-confidence in the acquisition of new skills, in developing autonomy in clinical decision-making, and forming clinical judgment, and should exude self-confidence with each patient encounter (White, 2009). Confidence in novice nursing students may help them to initiate patient care, engage in new learning experiences, attempt to employ new nursing skills, or try to connect new knowledge acquired in the classroom into the clinical practice setting. Experiencing early success in nursing programs improves retention in the nursing program, and enhances self-confidence among nursing students (Williams, 2010).

Nursing Program

Currently, nursing programs across the United States and at this research site are challenged on several fronts. While declining enrollment at institutions for higher education creates budgetary constraints, nursing programs are turning qualified applicants away due to nursing faculty shortages, limitations in clinical site availability, and regulations from state boards of nursing that mandate the faculty to student ratio. Additionally, nursing programs continue to be forced to develop innovative teaching strategies in place of the clinical learning opportunities that were traditionally done at the clinical facility due to restrictions in the types of nursing skills a nursing student may provide. These increasing restrictions on clinical learning opportunities can impair the ability of nursing programs to develop the self-confidence needed in nursing students to provide safe patient care and to successfully transition as nursing graduates into clinical practice.

Creating opportunities to enhance a nursing student's self-confidence can have positive effects on both the student and the nursing program. Nursing graduates with higher levels of self-confidence enter professional practice with "better clinical performance, the ability to effect change, the power to take on challenges, professional collaboration, and the aptitude to motivate others" (White, 2009, p. 112). Autonomy in clinical practice is formed and those at the receiving end of the nurse's care perceive the nurse to be confident and competent in the care provided (White, 2009). The use of simulation activities can assist nursing programs, such as this research site, in growing enrollment to meet society's needs for a growing nursing workforce of qualified, confident, competent nurses prepared to provide safe patient care.

Regulatory Bodies, Best Practices, and Simulation

Nursing programs are guided in their activities by regulatory bodies such as the Board of Nursing and programmatic accrediting organizations such as the National League for Nursing Commission for Nursing Education (CNEA). All regulatory bodies have a say in the use of simulation in nursing programs as part of their regulatory oversight. Another regulatory body, the National Council for State Boards of Nursing (NCSBN), created guidelines for prelicensure nursing programs to use as schools of nursing begin to implement simulation as a teaching technique (NCSBN, 2016). The NCSBN acknowledged in their guidelines that evidence supports the use of simulation as a pedagogy that can be integrated across prelicensure curriculum (NCSBN, 2016). While the State Board of Nursing for this research institution has yet to release guidelines outlining the use of simulation in prelicensure programs, speculation of regulations for its use are anticipated. The research site has identified the need to be proactive and to integrate more effective use of simulation throughout the nursing program to be in line with best practices.

Another influence for the development of this study includes accreditation. Accreditation shows a commitment to pursuing excellence and continuous quality improvement in nursing education. At this research institution, the nursing program is accredited by the CNEA through the National League for Nursing (NLN). Faculty are responsible for infusing the curriculum with contemporary, best practices both in the teaching pedagogies utilized as well as the clinical professional practice standards taught within the program. Faculty must create a learning environment that meets the diverse needs of learners, promotes student success, employs best practices, and assists students in acclimating into their role as

the professional nurse (CNEA, 2016). The use of simulation as a teaching technique can assist faculty in creating a culture for excellence by implementing curricula which provides current evidence-based best practices for teaching/learning and competencies which promote safe nursing practice.

At this research site, graduate competencies are strongly tied to prelicensure competencies developed by the Quality and Safety Education for Nurses (QSEN) Institute and the NLN competencies for graduates of nursing programs. All course objectives and student learning outcomes for the nursing program must show a link to both sets of competencies. The development of this DNP study was also influenced by the potential for simulation as a teaching strategy to assist novice students to begin to develop these competencies needed to become the professional nurse. The use of simulation can promote knowledge, skills, abilities, and attitudes such as self-confidence needed to become a professional nurse and incorporates the QSEN competencies of patient safety, evidence-based practice, teamwork and collaboration, and patient-centered care needed to provide quality care (QSEN Institute, 2017). High-fidelity simulation has been proven to be an effective teaching strategy for integrating the QSEN competencies needed for safe nursing care (Schaar, Ostendorf, & Kinner, 2013). The research site faculty believe the NLN competencies of “nursing judgment, spirit for inquiry, human flourishing, professional identity” (NLN, 2017, para 1) may also be met with the use of simulation as a teaching strategy.

Patients

Patients must feel comfortable and confident in the care they are receiving; therefore, nurses and nursing students that display self-confidence promote patient comfort (White,

2009). Lack of self-confidence can interfere with a nursing student's ability to create a rapport with patients and may raise patients' concerns about the student's competence in providing safe nursing care (Blum et al., 2010). Additionally, lack of confidence may further jeopardize the safety of patients if students are unable to identify a patient's deteriorating health status, feel confident in reporting concerns to clinical faculty or nursing staff, or confident in monitoring for changes in the plan of care.

Review and Summary of Relevant Literature

Finding innovative ways to employ confidence-building teaching strategies early in a nursing curriculum may increase the likelihood of student success (Lundberg, 2008). Simulation offers a teaching strategy that can enhance the confidence levels of nursing students. Simulation provides experiential learning that may assist learners in transferring newly acquired knowledge, skills, and attitudes into a clinical practice setting in a safe, more confident, and competent way. Novice nursing students often enter their first clinical rotation with limited experience in patient care. Fear of harming patients, transferring newly acquired knowledge and skills, and concerns for meeting clinical course expectations can lead to decreased levels of confidence, an increase in anxiety, and overwhelming concerns for student success. Simulation has been shown to aid novice nursing students to prepare for their first clinical rotation and enhances confidence levels (Bremner, Aduddell, Bennett, & VanGeest, 2006). However, determining which type of simulation, low-fidelity or high-fidelity, is most effective in enhancing student self-confidence levels must be evaluated in the review of literature to determine best practices and practical approaches given the considerable cost differences between the types of simulation nursing programs can utilize.

The review of relevant literature explored teaching strategies related to simulation and its impact on enhancing the confidence levels of beginning nursing students. Simulation as an innovative teaching strategy was reviewed. Low-fidelity simulation through role-play and high-fidelity simulation with the use of a human patient simulator were evaluated as well with the hope to identify a link between the relationship among each type of simulation and the ability to enhance self-confidence of nursing students. The literature review looked for support of these modalities in beginning nursing students preparing for their first clinical rotation. Articles related to the selected theoretical framework, the theory of self-efficacy, as well as the instrumentation for this proposed study, the Confidence Scale (C-Scale), have been presented. A summary of the major themes, strengths, weaknesses, gaps in research methodology and in the literature have been presented.

The ProQuest, Cumulative Index to Allied Health Literature (CINAHL), EBSCO, and OVID databases were utilized to identify scholarly, peer-reviewed, English only, full-text research articles. In addition, searches were conducted using the same parameters with the Organization for Associate Degree Nursing's journal, *Teaching and Learning in Nursing*, as well as the International Nursing Association for Clinical Simulation and Learning's journal, *Clinical Simulation in Nursing*. While the most current and relevant literature was sought, no timeframe was utilized to incorporate all potential sources of relevant research including older articles that may be viewed as seminal research relevant to a robust review of literature. Keywords included: *beginning, nursing student, high-fidelity simulation, role-play patient simulation, and confidence level*. The keywords were used separately and in Boolean phrase

combinations. The implementation of the search strategy resulted in over three hundred articles discovered.

History of Simulation

Simulation is “a technique rather than a technology that is able to provide realistic environments or practice proxies for the purpose of learning, training, and practice” (Sanko, 2017, p. 21). Simulation use dates back several centuries, with some of the earliest uses documented in the 6th century, where simulation was used in the game of chess to strategize for war (Bradley, 2006; McDonald, 2016). In the 18th century, pelvic models and dead fetuses were used to train midwives (Sanko, 2017). The use of simulation crossed industries as the aviation industry developed flight simulation cockpit training in the early 1920s (Bradley, 2006; McDonald, 2016).

Simulation in Medical Education

Simulation entered the discipline of medical education in the 1950s with the introduction of ‘Resusci-Anne,’ a task-trainer mannequin created by a Norwegian toy maker by the name of Laerdal, to use for resuscitation training (Bradley, 2006). In the late 1960s, Sim One was developed by Abrahamson and Denson, with the most sophisticated technology of that time (Bradley, 2006). Sim One was the first human patient simulator (HPS) operated by a computer program and it was capable of simulating heart sounds, lung sounds, the ability to blink and respond to medications in response to the care provided (Bradley, 2006). Bradley (2006) noted Sim One failed to gain popularity because the cost of this technology in the 1960s limited the ability for companies to replicate this model. Low task trainers, static mannequins,

and role-play have been used over the years for low fidelity simulation both for their cost-effectiveness and convenience.

Today, high-fidelity human patient simulators (HPS), such as Sim Man 3G[®], provide realism with life-like qualities. The HPS can have conversations with students while they are assessing vital signs or auscultating heart, lung, and bowel sounds. Students can also converse with the HPS while performing more advanced nursing skills such as watching the heart monitor to determine electrical heart activity, initiating appropriate care while administering medications, inserting a catheter, or performing a blood transfusion. This is all controlled by an operator using a laptop or tablet in a simulation setting that can be designed to imitate an actual practice care setting. While HPS aims to provide realism to enhance the learning experience, it comes at a great cost. HPS and creating the simulated environment can cost hundreds of thousands of dollars for the purchase of equipment, initial and ongoing training of staff, maintenance of equipment, and the physical space required to house the simulation center.

Simulation in Nursing Education

Traditionally, nursing education has been grounded in theory and clinical practice experience to prepare nursing students for the role of the professional nurse. Methods such as lecturing, demonstrations, return demonstrations, and practicing psychomotor skills in supervised settings have been the mainstay. New educational modalities and training approaches are emerging to stimulate higher-level thinking, autonomy in decision-making skills, confidence in nursing skills, and experiences that simulate real-world experiences in a safe, controlled environment where students and patients cannot be harmed (Bremner et al., 2006).

These modalities provide opportunities for students to provide care in situations that are not always seen or experienced in the traditional clinical setting which assists students in decreasing their levels of anxiety with regards to encountering new patient care situations (Bremner et al. 2006; Dearmon et al., 2013).

Simulation in nursing education both as a modality and pedagogy can be dated back over 150 years with Florence Nightingale, a historical nursing leader, using simulation to demonstrate infection control measures (Sanko, 2017). Mrs. Chase, an adult-sized mannequin, was created in 1910 in Rhode Island and used into the 1950s to train nurses about physical assessment skills (Sanko, 2017). Indiana University was the first school of nursing in the 1930s to publish their use of a simulation laboratory and defined this space as an area to teach nursing students how to give injections (Sanko, 2017). Low-task trainers, such as injection pads or static mannequins have been used for years, and the use of role-playing as a low-fidelity simulation has as well.

Role-play. Role-play, as an active and cooperative learning teaching strategy, is a low-fidelity simulation. Fidelity refers to the level of realism within the context of simulating a real patient care experience (Galloway, 2009). Nursing faculty place students in learner/learner pairs and assign roles such as patient, nurse, or family member. Nursing faculty can create clinical scenarios for students to role-play, such as performing an assessment on the first day of clinical, as a means of practicing the psychomotor skills necessary to provide safe care. This also allows students to develop their confidence, clinical competency, affective skills such as communication and learning to develop patient rapport on an initial patient encounter, all while in a safe, controlled environment. Role-play also facilitates reflective thinking (Christiaens

& Baldwin, 2002). Advantages to role-play include students recognizing immediately any personal deficiencies in playing the role of the nurse, opportunities to ask clarifying questions or reflect on attitudes and values that students must address before entering the patient care environment (Christiaens & Baldwin, 2002). Not all students see the realism in this activity which can affect their ability to make this a teachable moment that can be transferred into their practice. If this strategy is employed, Comer (2005) suggests that role-playing patient care simulations should reflect the level of the learner and will provide the educator opportunities to address the various learning style needs of the students.

According to Sanko (2017), the use of simulation became much more accepted as a teaching strategy in response to the Institute of Medicine's (IOM) 1999 landmark report, *To Err is Human*, where the IOM stated almost 100,000 deaths occurred annually because of preventable medical errors. Recognizing the value in "crisis management and team-based training" as the aviation industry had demonstrated previously, medical and nursing education responded by employing the use of more simulation (Sanko, 2017, p. 25). Practicing clinical skills on real patients is not always ideal for new nursing students due to increased patient acuity or limited clinical site availability (Yuan, Williams & Fang, 2011). Nursing students are increasingly limited in the types of nursing skills they are permitted to perform while at the traditional clinical site setting. Additionally, the lack of clinical educators presents challenges in nursing programs and, as a result, increases in the use of simulation are evident (Kimhi et al., 2016).

With the increase in simulation use, several Boards of Nursing (BON) sought permission from the National Council of State Boards of Nursing (NCSBN) to use high-fidelity simulation

(HFS) in place of some of the required traditional clinical experiences for prelicensure nursing students. However, a gap in literature existed in studies determining if high-fidelity simulation had enough rigor to replace a high quality traditional clinical experience, and, if so, what percentage of time in simulation could replace students being at the traditional clinical site (Hayden, Smiley, Alexander, Kardong-Edgren & Jeffries, 2014). In 2014, the NCSBN responded to this request by publishing *The NCSBN National Simulation Study*; a large, longitudinal, randomized control trial. This landmark research study determined that high-quality simulation could be used as a substitution for up to fifty percent of traditional clinical experiences without compromising end-of-program outcomes and producing nursing graduates ready for clinical practice (Hayden et al., 2014; Ochylski, Aebersold, & Kuebric, 2017). This powerful research study, and the endorsement of the NCSBN, further emphasized the acceptance of high-quality simulation in nursing education and gave validity to the use of high-quality simulation in nursing education.

Simulation provides an innovative, realistic active learning experience that assists the student in making connections in their cognitive knowledge and clinical practice (Alfes, 2011; Goodstone et al., 2013). Integrating simulation early in the nursing curriculum and in a meaningful way can increase confidence when introduced prior to the clinical rotation (Kimhi et al., 2016). Students can make mistakes, learn how to correct their performance, experiment, ask questions, repeat clinical care scenarios, and develop efficiency in providing care without fear of harming the patient or repercussions for poor clinical performance in the clinical learning experience.

High-fidelity simulation. High-fidelity simulation (HFS) gives context to learning through experiential learning. Demonstrating competency in psychomotor skills is an integral component of professional practice. Development of psychomotor skills should occur as students' progress through the nursing curriculum. High-fidelity simulation for novice nursing students helps give context to learning by allowing students to assess aspects of the patient care situation that may alter the way nursing care is given whereas mastery of psychomotor skills in a skills laboratory setting cannot always provide the same context (Bambini, Washburn, & Perkins, 2009). Students need to find value in their learning and feeling success in performing a skill can lead to an increase in self-confidence. High-fidelity simulation provides rich experiential learning for practicing skills in a safe, realistic, and controlled environment (Jarvill et al., 2017; Jeffries, 2016). Learning with real patients is not always possible given the level of patient acuity, and skill training on real patients can raise concerns for patient safety (Yuan et al., 2011). Limited opportunities for learning in the clinical environment hampers the potential for students to develop clinical confidence and competence. Simulation provides an opportunity to develop both aspects of the professional nurse.

According to the extensive literature review performed by Yuan et al. (2011), qualitative studies regarding HFS have shown positive outcomes in developing self-confidence, however, insufficient data in quantitative studies have shown evidence that this occurs. Yuan et al. (2011) suggested that evaluating confidence levels after students have encountered patient scenarios like the HFS may be a better way of determining the effectiveness of this teaching modality in influencing students' confidence levels in providing care. Smith and Roehrs (2009)

identified in their quantitative study that the use of HFS in preparing students for their first clinical experience enhanced self-confidence.

Given the potential to grow student self-confidence by using simulation, limitations to this teaching strategy may still exist. While simulation aims to create a realistic patient care environment, it is not totally realistic. Students are still aware that the environment is controlled, and a real-life patient will not be harmed by the nursing student providing care. This may inadvertently elevate a student's level of confidence and make it difficult for faculty to truly evaluate the clinical competence a student possesses (Yuan et al., 2011). Students may still have difficulty in transferring their self-confidence and competence from the simulation laboratory setting to the clinical setting, showing only the ability to focus on components of care rather than being able to see the entire picture (Yuan et al., 2011).

Deliberate practice

In either confidence building teaching strategy, role-play (low-fidelity simulation) or high-fidelity simulation, incorporating opportunities for deliberate practice is key, especially for the novice nursing student. Deliberate practice is defined as "the repetition of a structured activity with the goal of improving performance" (Owen et al., 2017, p. 1). Providing feedback to the learner gives this activity an expert performance approach which supports that over time mastery of skills when coupled with repetitive practice and opportunities for immediate feedback can lead to mastery (Owen et al., 2017).

Students

For novice nursing students, the development of their self-confidence through the nursing program is critical to advancement (Franklin et al., 2015). False beliefs about one's

abilities to perform with procedural competence, such as with physical assessment, may lead to error and potential harm to the patient (Cason, Atz, & Horton, 2017). Students who lack confidence may experience a fear of harming a patient or making a mistake which may prevent them from initiating patient care (Van Horn & Christman, 2017). Students with higher levels of self-confidence are more likely to put their clinical skills to practice and have a stronger likelihood of meeting their clinical goals (Franklin et al., 2015). Exposure to activities that create experiential learning and are led by nursing faculty that show care, trust, and respect for the nursing students and the ability to meet the learner where they are at in the development of professional nursing abilities, has been linked to increases in student retention and empowerment in their ability to persist and succeed in the nursing program (Williams, 2010). Empowerment and retention reflect levels of confidence for nursing students as well.

Associate degree nursing students (ADN) are the largest population of prelicensure students taking the National Council Licensure Exam (NCLEX) annually (Rice, 2015). This population of nursing students, in contrast to other prelicensure programs such as the Bachelor of Science in Nursing (BSN), is required to quickly demonstrate theoretical knowledge, psychomotor skills, and abilities to be prepared to provide care in a complex patient care setting early in the program, and within an accelerated time frame to graduation as compared to the BSN. Lack of self-confidence can hinder the ability to learn, grow in performance, and be successful in real-life care settings (Lundberg, 2008). The mastery of newly developed skills and feeling success when demonstrating these skills builds confidence that can carry over to similar patient care experiences (Lundberg, 2008). Van Horn and Christman (2017) noted confidence is a predictor of how students will handle difficult situations.

PICOT Question

In first-semester Associate of Science (ASN) nursing students, how does integrating an individual high-fidelity physical assessment simulation compared to role-play patient simulation using learner/learner student pairs affect self-confidence levels prior to their first patient care experience? The population was represented by nursing students in their first semester of an ASN program accredited by the National League for Nursing Commission for Nursing Education Accreditation (CNEA) at a small community college in a Midwestern state. A high-fidelity physical assessment simulation (HFS) was integrated into orientation activities during the first medical-surgical clinical rotation for half of the first-semester ASN cohort. The HFS was completed one week prior to students caring for their first clinical patient. The remaining half of first-semester ASN students participated in a low-fidelity simulation involving role-play of the same simulation scenario during the first week as well. Confidence levels were measured among both groups pre- and post-simulation activities prior to the first patient care experience in week two of the clinical rotation.

Population: Prelicensure Nursing Students

The population for this DNP project focused on the first-semester ASN nursing student. However, research for this population and the impact of simulation on enhancing confidence levels was difficult to find. Blum et al. (2010) noted the sparse amount of quantitative research available for entry-level nursing students for this topic. Qualitative research is limited as well. A large majority of studies have evaluated the impact of simulation on confidence levels in Bachelor of Science (BSN) nursing students at various levels of the prelicensure program or advanced practice nursing students who are already licensed as registered nurses.

With the goal to implement confidence-building teaching strategies, Blum et al. (2010) added to the limited research for entry-level prelicensure nursing students and evaluated the impact of HFS on student perceived self-confidence and faculty perceived clinical competence. A quasi-experimental, quantitative study was conducted with a final sample of 53 BSN nursing students in a health and skills assessment laboratory course for beginning nursing students participating in their first clinical rotation. Students were randomly divided into groups either in a traditional skills laboratory course which utilized classic teaching modalities such as task trainers and student role-play or the interventional group which used HFS to demonstrate nursing skills competency. Each group met weekly during the semester for the seven-hour skills lab receiving lecture and opportunities to practice skills to gain confidence and competency within the defined course objectives. All students completed the associated theory course together. Blum et al. (2010) utilized the Lasater Clinical Judgment Rubric (LCJR) and had students and faculty complete the LCJR during midterm and finals weeks of their first clinical course independently. The LCJR had been noted previously for its inter-rater reliability ($\alpha = .87$), internal consistency (Cronbach's α ranging .886 to .931) and validity making it an appropriate instrument for this study (Blum et al., 2010).

Findings of the study revealed independent samples *t*-tests which showed no statistically significant differences between mean self-confidence scores in either lab setting at midterm or final (Paired-samples *t*-test: $t = 5.10$; $p = .00$) (Blum et al., 2010). However, Blum et al. (2010) noted a trend for more change in self-confidence in the traditional lab setting (within-group change 1.61 compared to 1.18 in simulation setting). Additionally, faculty identified a greater trend in clinical competence in this group as well using sample *t*-tests (within-group

change of 2.25 compared to 2.16 in simulation setting). While perceived self-confidence increased over the course of this semester, interestingly, clinical competence measured by faculty rather than student perceived self-confidence showed more improvement regardless of group. Traditional teaching strategies were validated indicating the continued use of task trainers, static mannequins, role-play with student volunteers, and return demonstrations among entry-level nursing students as an effective confidence-building teaching/learning strategy.

While the sample size was limited in determining the power of the study conducted by Blum et al. (2010), findings suggested further study among other populations such as ASN nursing students and across the various programs' curriculum were warranted. Best practices require faculty to explore teaching strategies which are most effective in assisting students to achieve desired learning outcomes, enhancing self-confidence and clinical competence in order to deliver safe patient care. Blum et al. (2010) indicated that traditional approaches are more cost-effective than HFS and are validated in their ability to elevate student confidence levels of novice nursing students. Pre-licensure nursing students in a foundations course may be better served with traditional teaching strategies (Blum et al., 2010). High-fidelity simulation may be more appropriate later in the progression of the program with advanced skills and increased knowledge.

In contrast to the findings of the study completed by Blum et al. (2010), Bremner et al. (2006) wished to determine if HFS with a human patient simulator (HPS) was an effective teaching tool from the perspective of 41 BSN novice nursing students performing a head-to-toe physical assessment in simulation. The mixed methods study evaluated perceptions of novice

nursing students in their first clinical rotation in the realm of simulation as a teaching/learning modality, limitations to the teaching/learning modality, and student confidence and comfort in performing assessment skills during simulation (Bremner et al., 2006). Students completed surveys after the simulation activity.

Students cited value in four realms of teaching/learning and in meeting their educational goals to include areas of utility, realism, confidence/comfort, and limitations (Bremner et al., 2006). Ninety-five percent of the novice students rated the simulation activity in the range of good to excellent; 68% stated simulation should be mandatory; 61% stated they felt more confidence in performing assessments; and 42% stated the teaching/learning method decreased anxiety associated with the first day of clinical as a new nursing student (Bremner et al., 2006). Qualitative data revealed that students saw value in simulation as a teaching modality as it made students realize where deficiencies existed in skill sets needed to be prepared for clinical practice. Twenty-six percent felt HFS using a human patient simulator provided realism (Bremner et al., 2006). Two students noted increased confidence in preparing for clinical (Bremner et al., 2006).

Some limitations of simulation as a teaching modality were noted by students. Twenty-two percent reported not having enough time with the simulator as a limitation, and two students noted a preference to completing the HFS alone rather than in groups of four (Bremner et al., 2006). These limitations suggest the importance of careful planning with regards to time for activity and consideration in making the modality for novice nursing students an individual simulation experience rather than group activity.

This study validated that simulation provides a way to diminish anxiety for students in new situations from the novice nursing students' perspective. As a result, in a review of literature and findings of their study, Bremner et al. (2006) developed best practices for Human Patient Simulator (HPS) use with novice nursing students. Best practices included: expressing clear learning objectives for the HPS activity; showing students clear linkage to course objectives and clinical objectives with the prescribed HPS scenario; ensuring faculty and students receive ongoing training on the use of HPS; working with students to receive feedback after each simulation as a quality improvement measure; and ensuring that a debriefing session occurs after each simulation (Bremner et al., 2006).

Stroup (2014) performed an integrative literature review to evaluate current evidence of the effectiveness of simulation in fundamental nursing courses. Stroup (2014) identified a lack of studies that possessed quality in the research methodology regarding rigor, an adequate sample size, design, or generalizability. Of the 15 studies reviewed, two themes emerged; simulation's effects on student learning and its application within nursing curricula.

The use of simulation within fundamental nursing courses in prelicensure programs has been identified as an effective teaching/learning strategy in enhancing confidence levels of nursing students; however, determining which type of simulation is best has been ill-defined (Stroup, 2014). Stroup notes the usefulness of both low-fidelity and high-fidelity simulation in foundational courses as these novice students lack experience, critical thinking skills, and knowledge. Students are anxious about providing patient care in a clinical setting and are just beginning to learn psychomotor skills. While simulation can address these deficiencies in novice nursing students which may enhance confidence levels after experiencing simulated

learning experiences (Dearmon et al., 2013), it is possible that any targeted active learning activities focused on developing psychomotor skills, experience, critical thinking, and knowledge may also benefit this population. With the repetition of learning experiences, confidence may be enhanced. Stroup (2014) notes the use of low-fidelity simulation may be more beneficial to schools of nursing regarding cost-effectiveness.

Intervention: High-fidelity Simulation

Simulation provides an innovative opportunity to meet the growing needs of schools of nursing to find creative ways for students to learn how to integrate acquired knowledge and skills into clinical practice, develop critical thinking skills, form reflective thinking, and enhance self-confidence without fear of harming 'real' patients (Kimhi et al., 2016; Woodruff, O'Neil, & Walton-Moss, 2017). While traditional clinical experiences in hospitals, long-term and outpatient-care settings have been the mainstay, high-fidelity simulation has recently been shown in a longitudinal, randomized, controlled study to be a valid alternative to replacing up to 50% of traditional clinical time without compromising on prelicensure students' abilities to meet learning outcomes or be prepared to enter professional nursing practice (Hayden et al., 2014). This is important as it is becoming increasingly difficult to locate clinical space for schools of nursing challenged to grow enrollment. Faculty shortages and increased patient acuity add to the dilemma of how to provide clinical experiences to prelicensure nursing students in a safe learning environment.

Using a convenience sample of 63 first-semester BSN students, Alfes (2011) performed a quasi-experimental study to evaluate the effectiveness of simulation as a learning strategy compared to traditional teaching methods used to teach new nursing students basic nursing

skills in a skills laboratory. Students in a foundations course were assigned to a group and asked how confident they felt in providing basic care for a patient experiencing pain. Students were then placed into the control group or the simulation group. The students in the control group were instructed on how to perform interventions, given opportunities to watch demonstrations and practice with low-fidelity mannequins, and then perform return demonstrations. Students in the simulation group were shown a brief video portraying a patient experiencing post-operative pain and then role-play providing care for the patient using a human patient simulator. In both groups, debriefing sessions occurred immediately after the sessions to provide feedback to students on their knowledge, skills, and abilities.

The National League for Nursing's Student Satisfaction and Self-Confidence in Learning questionnaire was used for the Alfes study. The reliability of this questionnaire had been validated previously showing Cronbach's alpha coefficients of 0.94 and 0.87 for the two subscales of student self-confidence and student satisfaction with learning respectively (Alfes, 2011). Findings of the study revealed students experiencing simulation reported higher levels of self-confidence ($M = 32.48$) in comparison to students instructed in the traditional skills laboratory ($M = 30.74$). Both groups showed statistically significant increases in levels of confidence following their learning activity (traditional group $t(33) = 3.70, p < 0.01$; simulation group $t(28) = 3.29, p < 0.01$).

While students were more confident after experiencing the simulation, both active learning activities enhanced beginning nursing students' levels of self-confidence. In addition, both activities also provided students with the opportunity to learn and perform basic nursing skills in a safe learning environment. Students were also provided immediate feedback

regarding their performance. Nurse educators that utilize either teaching strategy must ensure that leveling of the activity occurs (Alfes, 2011).

Cardoza and Hood (2012) completed a two-year study using a descriptive correlational design to evaluate the integration of using a new teaching modality, high-fidelity simulation and examined the impact this teaching modality had on the self-efficacy levels of senior BSN students when providing family-centered care in a pediatric and maternal/child clinical rotation. The researchers utilized Bandura's theory of self-efficacy as their theoretical framework with the belief that integrating simulation into the curriculum can build self-efficacy and confidence in students working in various healthcare settings (Cardoza & Hood, 2012). Using a convenience sample of 52 BSN students in their final semester of the program, Cardoza and Hood (2012) created two high-fidelity pediatric simulation scenarios to use on the first day of the clinical rotation and again during week seven which was the last week of the course. These students had not yet experienced HFS but had three previous semesters of knowledge and clinical experience. To increase the fidelity of these simulations, the researchers also incorporated actors to play the role of family members.

Students completed the self-reported survey, the General Self-Efficacy (GSE) scale, on the first day of the rotation, before (T1) and after (T2) the two simulation scenarios. Students completed the same survey again in the same fashion (T3 and T4) during the last week of the course after weeks of classroom and clinical experiences. The GSE measured the belief students had in their ability to provide family-centered care. The GSE is a 10-item, 4-point Likert-type scale that has been tested for reliability showing a Cronbach's α value ranging from

.76 to .90 from samples in more than 20 nations (Cardoza & Hood, 2012). Comparative data was used with two previous senior nursing classes.

The findings of the study indicated that students have difficulty transferring previously acquired knowledge and skills and may be unaware of this deficit. Students indicated in both simulation groups a higher level of self-efficacy at T1 (Group 1 $M = 31.39$; Group 2 $M = 31.29$) which significantly decreased at T2 (Group 1 $M = 31.19$; Group 2 $M = 24.76$). However, after several weeks of classroom and clinical experience, along with a self-awareness of deficiencies identified during the first high-fidelity simulation experiences, students' self-efficacy improved in the last week of the course (T 3 Group 1 $M = 32.84$; Group 2 $M = 26.76$; T4 Group 1 $M = 34.0$; Group 2 $M = 29.0$).

As Bandura's theory postulates, a self-awareness of deficiencies coupled with opportunities for mastery can improve one's self-efficacy (Cardoza & Hood, 2012). The researcher's framework also allowed them to identify that for both groups, identifying self-efficacy in providing family-centered care can be "predictive as well as prescriptive and that belief in oneself can either enhance or impede performance based on the individual's capacity to perform the task" (Cardoza & Hood, 2012, p. 146). The study revealed findings which suggest that the use of high-fidelity simulation can be an effective teaching modality to assist students in identifying any deficiencies in providing patient care. By repeating this activity several weeks later, it allowed the researchers to also see the potential for HFS to allow faculty and students to measure learning outcomes by transferring knowledge and skills gained over the course of a clinical rotation. Given the small sample size of this study, repeating this study on a larger scale is warranted.

In further support of the results found by Cardoza and Hood regarding benefits of HFS, Roh (2014) also identified measuring prelicensure nursing students' levels of self-efficacy when performing specific tasks during a high-fidelity simulation may predict student behaviors that can impact patient outcomes. Roh (2014) explored the effects of high-fidelity simulation as compared to medium-fidelity simulation and its impact on self-efficacy when performing resuscitation skills. Roh (2014) used a pretest-posttest nonequivalent control group design using a convenience sample of 163 second-year diploma nursing students. The Resuscitation Self-Efficacy Scale, a 5-point Likert-type scale, was used to measure the students' beliefs in their ability to initiate and perform the specific skills needed for patients experiencing a cardiac arrest. The scale has been identified as valid and reliable with a Cronbach's α of .91 in previous studies (Roh, 2014).

In Roh's study, two groups of students in the clinical rotation rotated through the 2-week clinical placement in an emergency department and were either provided medium-fidelity cardiopulmonary resuscitation (CPR) training or high-fidelity simulation training. All students had previous CPR training prior to this clinical rotation. Students completed the Resuscitation Self-Efficacy Scale before and after the simulation experience. Findings of the study revealed that while both types of simulation can positively impact resuscitation self-efficacy, high-fidelity simulation showed a stronger impact than medium-fidelity simulation (HFS $t=9.327$, $p < .001$; LFS $t = 6.568$, $p < .001$) (Roh, 2014).

Roh (2014) stressed the need to provide opportunities for mastery of resuscitation skills to build confidence. Mastery of this skill can impact patient outcomes; therefore, nursing faculty should provide opportunities to enhance the confidence levels of prelicensure nursing

students performing this critical skill. Limitations of this study include the applicability of these findings as this study was conducted in South Korea and educational preparation and preexisting confidence levels may vary with students in the United States.

A comparative, quasi-experimental study was conducted to evaluate the difference in medium-fidelity simulation versus high-fidelity simulation in terms of student outcomes (Wang, Fitzpatrick, & Petrini, 2013). A convenience sample of 59 junior BSN students in China was assigned simulation groups. One group completed a simulation scenario using the human patient simulator in a high-fidelity simulation and the other experienced the same patient scenario but used a computer-based simulation.

The participants were asked to complete the Students' Satisfaction and Self-Confidence Scale, the Simulation Design Scale (SDS), and the Educational Practices in Simulation Scale (EPSS). The Cronbach's α for satisfaction (.94), self-confidence (.87), simulation design (.92), and educational practices (.86) were previously identified and determined to be valid and reliable (Wang et al., 2013). The participants attended clinical two days per week during the 16-week course before completing the one-hour simulation session during week 14. One week prior to the simulation, all students received a lecture on coronary heart disease which was the focus of the simulation scenario. After the lecture, students were provided objectives for the upcoming simulation.

While all students reported feelings of satisfaction and confidence in learning for both simulation activities, the medium-fidelity simulation group noted higher levels satisfaction ($M = 4.50$) and confidence ($M = 4.08$) in their learning than the high-fidelity simulation group (satisfaction $M = 4.23$; confidence $M = 3.79$) (Wang et al., 2013). All students reported in their

EPSS that both simulation activities encouraged active learning, diverse ways of thinking, collaboration, and high expectations (Wang et al., 2013). Higher fidelity experiences simulate more realistic patient care experiences. The findings would suggest, in this case, that higher fidelity did not necessarily create a more effective teaching method in this study. However, it is surprising given that the participants were junior nursing students that their preference was not for the HFS.

These findings may suggest that the students were less confident in their abilities to perform both psychomotor skills and critical thinking skills for the HFS in comparison to just critical thinking skills alone using the computer-based simulation. The students may have more time for decision-making during the medium-fidelity simulation as compared to HFS. This may enhance their confidence level. Limitations of this study include the small convenience sample and a lack of diversity in the sample population. While medium-fidelity may have appeared to be more effective, it is important for nursing faculty to see both teaching methods were well received by the participants.

High-fidelity simulation requires careful planning and effective implementation to be an effective confidence-building teaching strategy (Woodruff et al., 2017). The two-year descriptive correlational, single-group post-test design completed by Woodruff et al. (2017) evaluated the use of HFS with advanced practice nursing students. The most important finding from this study highlighted that for advanced practice nursing students, realism added to the validity of the learning activity and only fidelity was significantly associated with self-confidence. While the researchers note that some of the students in this study lacked registered nurse (RN) experience, a majority did which may account for why realism affected

the outcome. Taking the pearls learned from this study, educators in prelicensure nursing programs must understand the importance of fidelity when utilizing HFS as a learning tool. Novice nursing students may not yet fully identify the fidelity of the simulation scenario but certainly, as HFS is incorporated throughout a nursing program, fidelity will be key in giving context to the learners' experience. Experiential learning may enhance the potential simulation has to increase students' self-confidence levels.

Comparison: Role-Play Simulation

A gap in knowledge exists in directly comparing role-play, a low-fidelity simulation, versus high-fidelity simulation using a human patient simulator in the ability to determine which teaching modality better enhances self-confidence levels of novice nursing students. However, the literature search for low-fidelity simulation compared to HFS led to the discovery of Goodstone and colleagues' (2013) research, a two-group quasi-experimental design study which evaluated the effects of simulation on the development of critical thinking among novice students in an associate degree nursing (ADN) program. Goodstone et al. (2013) noted that HFS has increasingly become the standard as a teaching/learning modality. Simulation imitates a real patient care experience in a safe way and assists the learners in translating newly acquired knowledge and skills into clinical practice. Development of critical thinking skills in the simulation laboratory may lead to enhanced self-confidence levels (Goodstone et al., 2013).

In Goodstone et al.'s (2013) quasi-experimental study, case studies created by faculty were used as the comparator for low-fidelity simulation. Samples consisted of 42 ADN students in two sections of a health assessment course. The course included one-hour lecture and a three-hour lab that ran concurrently with the fundamentals course over a semester. Groups

completed weekly case studies or HFS related to course objectives for the semester. Both groups had an hour of video/demonstration, one hour of partner practice, and then either an hour of case study or HFS. Students completed the Health Studies Reasoning Test (HSRT); a health-specific critical thinking test that is appropriate for new nursing students (Goodstone et al., 2013).

Simulation, either low or high-fidelity, as a teaching modality can promote critical thinking; yet one type of simulation doesn't outweigh the other (Goodstone et al., 2013). Analysis of the results indicated that both modalities increased critical thinking in either group; no statistical difference existed among the modalities for this study (Goodstone et al., 2013). The HSRT pretest composite scores for simulation ($M = 19.65$) and case study group ($M = 19.23$) showed little difference as compared to the posttest composite scores for simulation ($M = 19.65$) and case study group ($M = 19.24$). While the sample size limited the power of this study, other limitations included that ethically the study could not provide for a control group and prevent a cohort of students from the opportunity to improve critical thinking (Goodstone et al., 2013). Further research with a larger sample size across multisite locations is warranted to identify which critical components of either simulation may be more beneficial to achieve positive education outcomes (Goodstone et al., 2013).

Using a randomized, two-group experimental design, Butler and Brady (2009) explored the use of a pediatric fluid and electrolyte scenario using low-fidelity simulation and high-fidelity simulation over a 2-day period. A convenience sample of 31 associate degree nursing students who had successfully completed the pediatric course was included in the study. Students were randomly assigned to groups. Neither type of simulation had previously been

used in the curriculum nor experienced by these students. Following the simulation, students completed surveys developed by the National League for Nursing that addressed simulation design and satisfaction and self-confidence in learning.

Three major findings were revealed in this study. One major difference in design between low-fidelity simulation (LFS) using static mannequins versus high-fidelity simulation (HFS) rests on the level of fidelity or realism. Students showed a preference for HFS in its ability to create a more realistic learning experience (Butler & Brady, 2012). Both groups noted simulation as an active learning strategy which enhances problem-solving abilities and was a good use of their learning time. The most significant finding was HFS generated higher levels of student satisfaction and confidence in learning (LFS $M = 55.33$; HFS $M = 61.86$, $t = -3.362$, $p = .004$) (Butler & Brady, 2012).

While the study shows value in both types of simulation, HFS may have had a greater impact on this population of students. Limitations of this study include not only a small sample size but also the fact that both teaching/learning strategies were new to this population. Butler and Brady (2012) suggest that using these new active learning strategies may have garnered higher scores for favorability due to the newness of the activities. Regardless, the study demonstrates the importance of identifying both forms of simulation as valid learning strategies, and preference for greater fidelity is achievable through HFS. Given that these students were in a pediatric course and had previous medical-surgical clinical experience, it is also plausible to consider that the level of realism may not have been a preference if the activity had been completed using novice nursing students in a lower level nursing course.

In a study conducted by Dunn and Riley-Doucet (2017), student-led role-play simulation scenarios that mimicked real-world clinical experiences were evaluated for this teaching modality's effectiveness in enhancing prelicensure nursing student self-confidence. The focus for these researchers was to develop scenarios that integrated medical-surgical and mental health nursing into the design of the scenarios to better reflect the complexity of patient care and comorbidity often seen in the acute care setting. The researchers hoped to evaluate if such scenarios could enhance self-confidence in senior-level BSN students regarding their skills in assessment and management of these patients.

A convenience sample of 194 senior-level BSN students was recruited for this study. The role-play simulations occurred at the end of the semester after students had completed their didactic coursework for both mental health nursing and medical-surgical nursing. The researchers designed the scenarios to integrate objectives from both courses, and each scenario required a student to role-play both mental and physical health symptoms while other students role-played the role of the nurse, communicating appropriately and responding with the appropriate knowledge and skills to properly assess and manage the patient's care. Students worked in either dyad, simulating patient-nurse encounters, or triads, simulating nurse-patient-family member encounters. The students were also given the opportunity to observe these simulation scenarios and use reflective thinking in their observation to identify ways to improve their own performances or identify gaps in their own knowledge either about the disease processes or the appropriate nursing responses.

Self-confidence levels were measured pre- and post-activity using the Mental Health Nursing Clinical Confidence Scale (Mental Health NCCS) and the Medical-Surgical Clinical

Confidence Scale (Med Surg NCCS). The Mental Health NCCS had been selected as it was previously identified as reliable through a test-retest reliability of 0.86 and a Cronbach's α of .92 (Dunn & Riley-Doucet, 2017). The Student Perception of Effective Teaching in Clinical Simulation Scale (SPETCSS) was also selected due to its validity and reliability to evaluate how students perceived this teaching strategy as being useful in meeting their learning outcomes ($\alpha = .95$) and the importance of student-led simulations through role-play ($\alpha = .96$) (Dunn & Riley-Doucet, 2017).

The findings of this study revealed that students' self-confidence levels rose significantly after role-playing and observing these scenarios (Mental Health NCSS $t = -1.74$, $df = 193$, $p < .01$; Med Surg NCSS $t = -14.12$, $df = 193$; $p < .01$) (Dunn & Riley-Doucet, 2017). The SPETCSS scores indicated that simulation was an effective learning strategy (before: $M = 3.20$; after: $M = 3.75$) (Dunn & Riley-Doucet, 2017). While this study did not compare the teaching strategy to another methodology, findings did reveal the value in role-play simulation as an effective learning strategy that allowed students to integrate their knowledge of disease processes along with their ability to think like a nurse and respond to the patient's needs in a simulated environment. Additionally, the use of observation also allowed for experiential learning through reflection. Debriefing sessions following these scenarios aided in solidifying the students' knowledge, skills, and abilities which positively affected their perceived level of confidence in caring for a patient with comorbidities.

The outcome of the study also validated the use of role-play as an effective teaching modality in that students identified the value in this mode of teaching/learning. The researchers' study findings suggest that role-play, a more cost-effective teaching/learning

strategy as compared to high-fidelity simulation, can positively impact students' self-confidence levels. Limitations of this study, however, do exist. This study utilized a non-random sample whereby all students were required to complete this activity for their course. In addition, students acknowledged that some students were not as skilled in role-play and that the realism of the scenario may have been impacted. Further research at another institution using the design of this integrative role-play simulation would be warranted to validate the findings of the study.

Sharpnack and Madigan (2012) developed a pilot program using low-fidelity simulation for sophomore nursing students completing their first medical-surgical theory and clinical courses. In the pilot program, faculty-developed low-fidelity simulation scenarios using role-play that incorporated the use of static mannequins and computer-assisted instruction was used as an evaluation tool in the final two weeks of the course. Simulation strategies were evaluated by students with regard to simulation design, satisfaction in learning, and self-confidence.

Students reported that the low-fidelity simulation scenarios were realistic and emphasized that the activity provided an opportunity to experience success in clinical competencies (Sharpnack & Madigan, 2012). Moderately high levels of confidence in learning through simulation and mastery of the content were reported ($M = 4.30$) on a Likert scale of 1 to 5 with 5 being the greatest level of confidence. Sharpnack and Madigan (2012) stated low-fidelity simulation is an effective strategy for novice nursing students and the addition of computer-assisted learning to the low-fidelity simulation allowed for further synthesis and application of knowledge learned over the course of the semester. Because beginning nursing

students reported the simulation experience was realistic and appropriate to their level of knowledge, Sharpnack and Madigan (2012) identified this level of simulation as an effective evaluation strategy. Low-fidelity simulation can promote student learning and confidence while keeping costs low in comparison to higher-fidelity simulation technology (Sharpnack & Madigan, 2012).

Outcome: Confidence Level

To measure the outcome of self-confidence in novice nursing students, an understanding of its meaning as a concept was required. Self-confidence is the belief in one's self to be successful in performing a task, encountering a new situation, or acting in the appropriate way (White, 2009). According to White (2009), before confidence can build, some degree of learning of knowledge and skills must take place. To survey one's level of self-confidence, first, the individual must take an inventory of the knowledge and skill needed to complete the task (White, 2009). After this assessment has occurred, the individual forms a belief about the potential for experiencing success (White, 2009).

Faculty and nursing students must understand what shapes self-confidence so that conditions that foster its development can be created for the nursing student (White, 2009). Past experiences to include successes and failures, internal motivation, and resiliency help shape self-confidence (White, 2009). Goal-setting, optimism, and self-awareness are also important in forming one's confidence (White, 2009). Self-awareness can help control levels of anxiety or motivate one to ask for help. However, any amount of self-doubt can also diminish self-confidence (White, 2009). While social support can help one develop confidence, positive self-talk can as well (White, 2009). Opportunities to repeat an experience, observe others

perform procedures, interact with peers and faculty, and feel success can enhance self-confidence (White, 2009).

Brown et al. (2003) conducted a qualitative study to evaluate the meaning and impact of professional confidence as perceived by BSN nursing students. Student confidence was cited as a desired outcome as these students were more likely to be effective nurses (Brown et al., 2003). The study resulted in three discoveries. First, nursing students perceived professional confidence as “feeling, knowing, accepting, doing, looking, becoming and evolving” (Brown et al., 2003, p. 165). Secondly, childhood and other life experiences which occurred before entering nursing school and personality traits shape confidence (Brown et al., 2003). Lastly, experiences while in nursing school also shape one’s professional confidence (Brown et al., 2003). While the study provided a better understanding of the student’s perspective of developing the confidence needed to transition into the role of the professional nurse, the study did not identify the most effective ways for faculty to enhance self-confidence in their nursing students.

Thomas and Mackey’s (2012) quasi-experimental study attempted to evaluate the influence HFS has on increasing student self-confidence. A pretest and posttest survey design was implemented. With a sample size of 24 BSN students, researchers evaluated the Clinical Decision-Making Self-Confidence Scale results between perceived confidence levels of BSN and second-degree nursing students in traditional clinical alone or those also taking a clinical simulation elective course. Independent samples *t*-tests were used, and post-semester scores were subtracted from pre-semester scores. Levels of confidence at the beginning of the course were lower in the simulation course group versus the traditional group (Thomas & Mackey,

2012). However, at the end of the semester, the simulation course group ($M = 4.14$) demonstrated a higher level of change or more confidence in skills than the control group ($M = 0.70$) (Thomas & Mackey, 2012).

While the intervention group showed a more significant difference in levels of confidence, self-perception may have influenced the change in levels of confidence. Students taking the elective may have done so because they lacked confidence going into the traditional clinical rotation (Thomas & Mackey, 2012). Further research is warranted with a larger sample size, and to determine which aspects of the elective simulation course are most effective for learners. Researchers assert that levels of confidence in abilities may be impacted more when simulation is done in more advanced courses as an understanding of theory aids in making clinical decisions (Blum et al., 2010; Thomas & Mackey, 2012).

Students struggle with transferring theory into clinical practice (Bambini et al., 2009). Students' perceived abilities to master clinical skills, apply new knowledge, and adapt to clinical situations are influenced by their level of confidence and has the potential to affect patient safety. Repetitive practice and opportunities for experiential learning through simulation allows for confidence levels to potentially grow. Bambini et al. (2009) evaluated simulation as a teaching/learning strategy to increase levels of self-efficacy in clinical skills needed in preparation for the first clinical course in a BSN program. Bambini et al. (2009) noted that simulation promotes self-confidence in patient care through higher levels of self-efficacy gained in situational practice. One hundred twelve BSN students participated in the integrated, quasi-experimental repeated measures design with pretest and posttest surveys. Results provided

support for the use of simulation in enhancing confidence levels of students in preparing for the clinical experience especially with psychomotor assessment skills (Bambini et al., 2009).

The qualitative results allowed for three themes to emerge: communication; confidence and clinical judgment (Bambini et al., 2009). Students reported having a better understanding of communication styles and learned the importance of communicating effectively with the patient and their significant others (Bambini et al., 2009). Experiential learning assisted students in developing problem-solving skills, refining assessment skills, and increasing confidence levels (Bambini et al., 2009). Finally, clinical judgment emerged as a theme for students and allowed students to identify and understand the importance of prioritizing abnormal assessment findings and evaluating how and when to intervene (Bambini et al., 2009). These themes may not have been realized by nursing students or necessarily emerged in a traditional clinical care setting.

Utilizing the Nursing Student Self-Efficacy Scale (NSSES) pre-simulation and post-simulation among junior BSN students, Dunn, Osborne, and Link (2014) evaluated the use of HFS as a new teaching modality within their school of nursing. Dunn et al. (2014) studied the influence of this teaching approach in terms of impacting the students' self-efficacy for providing patient care and in communicating with their patient. The NSSES had been previously validated with prelicensure students attending a community college ($n = 149$) or BSN program ($n = 272$). The scale is a 20-question, 1 (low confidence) to 5 (high confidence) Likert-type scale addressing both psychomotor skills and communication skills (Dunn et al., 2014). Cronbach's alpha measured internal consistency for psychomotor skills ($\alpha = 0.94$) and communication skills

($\alpha = 0.95$). The NSSES was administered before simulation training and again after eight weeks of students participating in HFS twice a week.

Findings of this study demonstrated statistically significant changes in the level of self-confidence among these participants in both communication (pre-simulation $M = 4.08$; post-simulation $M = 4.44$) and psychomotor skills (pre-simulation $M = 1.81$; post-simulation $M = 2.64$) (Dunn et al., 2014). The use of high-fidelity simulation can positively impact student self-confidence with specific aspects needed to provide patient care. However, like the study performed by Bambini et al. (2009), the repetition of the activity may have been a contributing factor for the increase in self-confidence as efficacy develops with repeated experiences and feelings of success. Limitations of this study included the small convenience sample ($n = 26$) and lack of generalizability. Repeating this study at multiple study sites with a larger sample would be helpful.

Time: Intervention Prior to First Patient Care Experience

For nursing faculty, determining the most effective time to implement a new teaching/learning strategy within prelicensure curriculum is important. Faculty must ensure leveling of the activity so that it meets the learners' needs. Evaluating the response of students in perceiving a positive benefit after completing the activity as well as faculty's ability to see if the teaching/learning strategy assisted learners in meeting course objectives assists nurse educators in determining the continued use of the activity. While this literature review identified studies that implemented simulation at various levels of nursing programs, the element of timing for simulation activities into entry-level courses either prior to the students' first patient care experience or alongside the first clinical rotation to ameliorate the stress

levels associated with entry-level nursing students encountering their first patient care experience (Dearmon et al., 2013) should be considered. High stress levels may affect the new nursing student's ability to successfully perform tasks, gain new knowledge, communicate effectively, think critically or make clinical decisions appropriate to the patient encounter; further decreasing levels of perceived self-confidence in the skills required to provide safe, competent nursing care (Dearmon et al., 2013).

Dearmon et al. (2013) created a two-day simulation-based orientation for BSN students preparing to start their first patient care experience. Levels of anxiety and confidence in performing skills were measured. The study sought to evaluate if a simulation-based orientation could assist new students in decreasing levels of anxiety, increase knowledge acquisition, and enhance self-confidence. Additionally, Dearmon et al. (2013) hoped to discern the relationship between anxiety and self-confidence. Using a mixed-method, quasi-experimental approach, the study included 50 BSN (novice) nursing students in a foundations course preparing to begin their first clinical rotation. Students completed a two-day simulation based-orientation using scenarios with standardized patients (SPs) to simulate the first patient encounter at clinical. Students completed a Knowledge Assessment (KA) and Self-Confidence Assessment (SCA) developed by research faculty at their institution along with the well-established psychosocial instruments: State-Trait Anxiety Inventory for Adults (STAI) and Perceived Stress Scale (PSS) before and after the simulation activity.

The means and standard deviation of all scores were calculated. Results were considered significant at the level of .05 (Dearmon et al., 2013). Pearson's coefficient and regression analysis were used for PSS and SCA since both surveys were developed by faculty. A

significant negative correlation was identified between PSS and pre-test SCA ($r = -0.41$; $p = 0.00340$) meaning higher levels of stress related to lower levels of confidence (Dearmon et al., 2013). Interestingly, improvement in SCA was not related to PSS ($r = 0.10$) (Dearmon et al., 2013). Paired t -test analysis was used to compare pretest and posttest scores. Additionally, scores were reviewed and compared to demographic data in both focus groups and then analyzed using a two-sample t test. Knowledge acquisition was evidenced in posttest ($p = 0.0007$). More than 50% of students improved their KA score by one to four points (Dearmon et al., 2013). Pretest and posttest comparisons showed anxiety levels for all students decreased after the simulation. STAI scores showed decreased state anxiety after the simulation orientation. Self-confidence in skills performed in simulation improved through the activity for all students.

Analysis of the results found in the study by Dearmon et al. (2013) that using Standardized Patients (SPs) for a 2-day simulation-based orientation increased self-confidence levels in all students preparing to start their first clinical experience and helped to decrease their anxiety levels. Additionally, knowledge acquisition was evident as well. Simulation provides an opportunity for students to practice providing care without fear of harming patients. Simulation also provides an opportunity to create teachable moments and hit the pause button during a simulation to correct nursing skills. Feedback during this activity and within this simulated environment allowed for students to perform reflective thinking. Novice students could transfer knowledge and skills into practice without fear of negative feedback and evaluation from the clinical instructors. The researchers believe careful planning of the teaching-learning activity led to the success of this study (Dearmon et al., 2013).

Kimhi et al. (2016) performed a randomized, double-crossover design evaluating the impact of simulation and clinical experience among BSN students' self-confidence/self-efficacy for nursing process in a fundamentals nursing course. The authors acknowledged the overlap in the concepts of self-confidence and self-efficacy and chose to use the collective term *self-confidence/self-efficacy* in their study. The study focused particularly on the timing of simulation, whether it be provided at the beginning of the clinical rotation or at the end of the rotation. Kimhi et al. (2016) used the Self-confidence/Self-Efficacy for the Nursing Process Scale, a 21-item Likert-type scale, and allowed self-efficacy to be measured three times during the study. Fifty-six BSN students completed the surveys before the course began and then before and after simulation. One group had simulation before the clinical rotation and the other finished the rotation with the simulation activity.

Paired *t*-tests were used to evaluate the difference between self-confidence/self-efficacy between clinical experience and simulation groups. Both groups demonstrated a significant increase in self-confidence from beginning to end of the course ($p < .01$) (Kimhi et al., 2016). The timing of each activity, whether simulation occurred before clinical or vice versa, showed no significant difference in the level of self-confidence/self-efficacy. Findings show simulation and clinical experience have a positive effect on increasing self-confidence/self-efficacy levels in new nursing students. However, the timing of either teaching/learning strategy did not show a significant difference. Rather, the study findings suggest that adding simulation to a clinical rotation can have added effects in enhancing self-confidence/self-efficacy. However, the study warrants further replication with a larger sample size.

Burns, O'Donnell, and Artman (2010) performed a prospective design study using pre-simulation and post-simulation surveys to evaluate the knowledge and attitudes of first-year prelicensure BSN students participating in high-fidelity simulation as an adjunct to didactic instruction when learning the nursing process. Burns et al. (2010) wished to see if adding HFS as an active learning activity would aid novice students in developing problem-solving skills through the application of the nursing process. The researchers also noted the uniqueness of the timing of their study as limited data is available on evaluating the use of HFS in novice nursing students early in the nursing curricula (Burns et al., 2010). The convenience sample of students participating in the study was in an introductory nursing course and had no previous clinical experience.

While the researchers' findings supported their hypothesis that HFS along with traditional lecture would increase students' knowledge of the nursing process as a method to problem-solve (knowledge attainment $p < .001$), the pre- and post-survey findings revealed more significant changes in the attitudes of these novice students ($n = 114$) after participating in the activity. The students showed improvement in confidence in nursing skills ($p < .0001$), specific skills in caring for specific patients ($p = .0003$), communication with patients ($p = .04$) and other team members ($p < .0001$) (Burns et al., 2010). Limitations in this study exist. Repeating this study with a more rigorous methodology and larger sample size would add to the generalizability of the study. The findings suggest that adding HFS to traditional pedagogy early in the curricula can be effective for this population and faculty should consider adding HFS to supplement didactic course concepts rather than solely tying the modality to use in the clinical setting.

Theoretical Framework

The review of literature revealed several studies related to self-confidence, high-fidelity simulation, and prelicensure nursing students which utilized Bandura's theory of self-efficacy (1994) as their theoretical framework (Bambini et al., 2009; Bulfone et al., 2016; Cardoza & Hood, 2012; Christian & Krumwiede, 2013; Dunn et al., 2014; Kimhi et al., 2015; Lundberg, 2008; Oetker-Black et al., 2014; Rice, 2015; Roh, 2014; Thomas & Mackey, 2012; Van Horn & Christman, 2017). In each study, the researchers indicated that Bandura's theory of self-efficacy aligns well with high-fidelity simulation as a teaching/learning strategy. Additionally, the studies highlighted how mastery of skills through active participation in simulated experiences can enhance self-confidence among prelicensure nursing students.

Self-efficacy is the belief one has in their ability to successfully accomplish a specific task (Lundberg, 2008). The mastery of experiences is the most effective way to develop one's self-confidence (Bandura, 1994). Nurse educators can create a simulated learning experience that creates opportunities for students to experience mastery to enhance student self-confidence. Opportunities to repeat these learning activities in safe learning environments that cannot harm patients or students can be accomplished in simulated settings. Simulation also allows for modeling of desired behaviors through vicarious experiences and verbal persuasion where faculty can provide positive words of encouragement to encourage the promotion of self-confidence. Through the simulated experience, students may also learn to gain control of their physiologic states and find ways to cope with stress and anxiety through the simulated learning experience to provide safe patient care. Students can also self-reflect about their performance.

If students have positive feelings about the simulated experience they may be more likely to perform the task again in the future (Rice, 2015).

The mastery of experiences, vicarious experiences, verbal persuasions, and physiological states as identified in Bandura's theory of self-efficacy all can occur in a simulated learning environment and can influence the confidence level of prelicensure nursing students (Lundberg, 2008). Successes experienced build one's self-confidence. For novice nursing students, developing a mastery of clinical skills through repeated experiences in a simulated environment increases confidence, persistence, and motivation for learning (Van Horn & Christman, 2017). The stronger the level of self-efficacy, the higher one's goals may be for improved performance which can enhance patient care (Bambini et al., 2009).

Other Considered Frameworks

Kolb's experiential learning theory (ELT) has also been used as a theoretical framework in studies which validated the effectiveness of simulation as a teaching/learning strategy to enhance self-confidence in novice nursing students (Alfes, 2011; Dearmon et al., 2013). Experiential learning allows for students with various learning styles to develop their knowledge, skills, and attitudes to gain a deeper understanding (Alfes, 2011). A real-life situation or patient encounter experienced through a simulated learning experience allows for transformative learning to occur (Dearmon et al., 2013).

Four stages of Kolb's experiential learning theory can occur with planning on the part of the nurse educator. Four phases of ELT include do, observe, think and plan. In simulation, students provide hands-on care, reflect on their performance and the observation of others through debriefing, analyze what occurred, and create plans for how to apply their knowledge

from past experiences to future patient encounters. In this way, Dearmon et al. (2013) identify the act of successfully performing the skill and, perhaps more importantly, the opportunities to repeatedly identify alternative nursing actions that could have also been taken, as ways for deeper learning to occur. Experiential learning through a simulated environment allows for students to reflect and devise alternative plans for care whereas traditional clinical experiences do not always allow for students to identify an alternative approach while care is being actively provided.

Instrumentation

Using Bandura's theory of self-efficacy as the theoretical framework, Grundy (1993) developed the Confidence Scale (C-Scale), a 5-question Likert scale questionnaire, to measure an individual's perceived level of confidence associated with a specific task or psychomotor skill such as physical assessment at a specific point in time (Grundy, 1993). Using an instrument such as the C-Scale allows for the evaluation of very specific behavior and the associated efficacy in performing the nursing skill (Christian & Krumwiede, 2013). Experiencing success or mastery in the specific skill at a specific point in time creates opportunities to positively enhance self-confidence. For this DNP study, the C-Scale provided an opportunity to link the level of self-confidence a first-semester nursing student felt when performing a physical assessment pre- and post-simulation activities to correlate the effectiveness of teaching strategies employed to develop a student's level of self-confidence.

Martin (2014) utilized the C-Scale to determine if integrating simulation prior to the first clinical experience for junior level BSN would enhance the students' self-confidence. Using a convenience sample of 20 nursing students, the C-Scale was administered prior to the

simulation activity. Upon completion of a simulation activity that would replicate similar clinical situations students would experience on their first day of clinical, Martin provided a debriefing opportunity for students to reflect on the simulation experience. Students were then asked to complete the C-Scale again to evaluate any change in the level of confidence associated with providing care.

Findings of the quasi-experimental pre-test post-test design study revealed that novice nursing students experienced a statistically significant increase in self-confidence after completing the high-fidelity simulation activity (Martin, 2014). Using a paired samples *t*-test, novice nursing students showed an increase in confidence for each of the 5 questions asked on the C-Scale. The question that asked if students felt confident in their ability to be able to perform the skills correctly showed a statistically significant increase from pre-simulation activity ($M = 2.80$) to post-simulation activity ($M = 3.75$) (Martin, 2014).

Limitations to the use of the C-Scale in evaluating levels of confidence for novice nursing students included the variance of time. Performance of tasks and associated levels of confidence can be time specific. The study's limitation included not only a small convenience sample but also a failure in measuring the novice nursing students' confidence after a period of time. By measuring levels of confidence immediately after the simulation activity, it is difficult to ascertain if the intervention, in this case, the high-fidelity simulation implemented prior to the first clinical experience, would have any carryover effects as novice nursing students initiate care on the first day of the clinical experience.

A randomized trial was completed to evaluate the effect of using simulation as a teaching strategy to enhance the confidence levels of baccalaureate nursing students

performing peripheral venous catheterization in pediatric patients (Valizadeh, Amini, Fathi-Azar, Ghiasvandian, & Akbarzadeh, 2013). Forty-five students were randomly assigned into three groups which included a control group and two intervention groups. A lecture on the procedure was provided to all groups before students were randomly assigned to the three groups. The control group received additional instruction using lecture, powerpoint slides, and images. The demonstration group received instruction and demonstration from the faculty before being allowed to practice the skill for twenty-five minutes on a static mannequin. The simulation group practiced performing the skill on a static mannequin before entering a simulation which required the student to establish a peripheral venous line. In addition, the simulation group received feedback immediately after the simulation and opportunities to ask the faculty member questions. All students completed the C-Scale questionnaire prior to the activity and again two weeks later when all students were asked to perform the skill on a static mannequin while being observed by the faculty member.

The results of this study indicated that using simulation as a teaching strategy significantly enhances the confidence level of prelicensure nursing students in a pediatric clinical rotation (Valizadeh et al., 2013). Changes in the self-confidence level pre- and post-intervention of the control group were 16.57. The changes in the level of confidence for the demonstration group were 23.00. The simulation group showed the most significant change in the level of confidence measuring 29.03. This study proved the effectiveness of simulation as a teaching method to enhance the self-confidence level of nursing students performing peripheral venous catheterizations as compared to more traditional teaching methodologies.

Limitations of this study include the small sample size. In addition, this study was performed in Iran. Replication of this study in the United States may be difficult. This study's use of a control group prevented a portion of students from potentially gaining confidence with regards to performing this psychomotor skill. Any replication of this study would ethically need to offer students in a nursing program the opportunity to experience a teaching strategy that could positively affect their level of confidence and success in performing a skill.

Wilmoth (2016) also utilized the C-Scale in determining the effectiveness of implementing an orientation simulation to enhance the confidence levels of new nursing staff hired and their ability to use a specific intravenous pump utilized within the hospital system to administer Heparin. This quantitative descriptive study included a convenience sample of 18 nurses hired to work on various units within the hospital. New nursing staff were required to participate in a two-day orientation. On day one, nurses were informed of policies and procedures, viewed demonstration of skills, and were given the opportunity to practice skills and receive feedback. On day two, nurses performed a simulation involving the use of hospital equipment to administer Heparin. Nurses completed the C-Scale prior to orientation activities on day one and again after the simulation activities concluded on day two. The study occurred over a period of four months to allow for a larger sample size.

Findings of Wilmoth's (2016) study indicated that incorporating simulation activities into the orientation could increase self-confidence levels for newly hired nursing staff when performing a task of using an intravenous pump to administer Heparin. The mean confidence levels pre-simulation activity was 11.11 and the post-simulation confidence levels were 17.22 (Wilmoth, 2016). Wilmoth's study showed the transferability of the Confidence Scale as an

instrument suitable for a population of nurses at various levels of skill and practice experience. The limitation of this study included the small sample size along with the factor of time. The study failed to demonstrate any carryover effects of confidence in performing this skill while in practice.

While Grundy (1993) suggested that any positive change in a nursing student's or nurse's level of confidence could indicate that there will be a significant impact on the individual's future performance, it is important to note the limitations of this instrument. Brown et al. (2003) provide a caution to the usefulness of this instrument noting that increases in the perceived level of confidence may not necessarily equate to student learning. Further studies may be needed to evaluate the relationship between gained confidence using simulation and increased student learning.

Summary of Literature Review

Several overarching themes from the literature review were discovered. First, confidence is an important nursing attribute and success in mastering the nursing skills needed to provide safe, confident, and competent nursing care at any level of a prelicensure program is vital. Experiential learning through simulation aids in the attainment of self-confidence and decreased anxiety. Another theme was the perceived benefit of simulation regardless of fidelity. Finally, the last theme was the timing of simulation activities was important in terms of improving confidence and decreasing anxiety. The timing of simulation activities within the curriculum and within courses adds value and gives context to learning for novice nursing students; careful planning and design of teaching/modality activities must reflect the level of the learner and provide a degree of fidelity to give context.

The review of literature identified a need to pursue this DNP project, especially because the population of focus, first-semester ASN students, has been underrepresented in the current literature. Additionally, a gap in literature exists in determining the most effective way to assist nursing students in developing confidence (Brown et al., 2003). The unique design of an individual based simulation experience was cited by novice students in a previous study as a potential advantage of a simulation activity to enhance student confidence (Bremner et al., 2006).

The review of literature showed various research methodologies to include quasi-experimental, quantitative pre-test post-test designs (Alfes, 2011; Bambini et al., 2009; Blum et al., 2010), mixed method (Bremner et al., 2006; Dearmon et al., 2013), and descriptive correlational (Cardoza & Hood; 2012; Rice, 2015; Woodruff et al., 2017) studies which sought to evaluate high-fidelity simulation as an effective teaching methodology to enhance the confidence levels of prelicensure nursing students. Limitations of these studies included small sample sizes and limited generalizability in that most of the studies utilized convenience samples. Very few studies focused on the associate degree nursing student (Goodstone et al., 2013; Rice, 2015) or the timing of HFS being integrated at the beginning of nursing curriculum or immediately prior to the first clinical experience (Alfes, 2011; Bambini et al., 2009; Dearmon et al., 2013; Kimhi et al., 2016). In addition, a three-group randomized trial (Valizadeh et al., 2013) and the NCSBN's landmark large, longitudinal, randomized control trial which validated the use of HFS in replacement of up to 50% of the traditional clinical experience (Hayden et al., 2014) were also identified. The lack of large random control trials available in the review of literature showed a significant gap in the literature and a weakness in determining the most

effective teaching methodology to enhance confidence levels among novice prelicensure nursing students, especially in associate degree programs.

High-fidelity simulation can effectively elevate the confidence levels of novice nursing students preparing for their first clinical rotation (Bremner et al., 2006; Dearmon et al, 2013; Goodstone et al., 2013; Smith & Roehrs, 2009). However, Alfes (2011) noted active learning activities that allow for experiential learning, to include both low-fidelity and high-fidelity simulation, can enhance confidence levels as well. Such findings suggest that the integration of active learning activities by the nurse educator can be just as impactful as focusing specifically on the use of high-fidelity simulation, and less costly.

Blum et al. (2010) suggest that traditional teaching methods such as role-play may be just as effective in enhancing novice students' confidence levels. However, Blum et al. (2010) also note in their findings that any teaching method must be leveled to the knowledge level of the learner. Role-play in a foundations course may be better suited to the level of the novice learner (Blum et al., 2010) and integration of higher fidelity simulation through the curriculum may be more effective in enhancing levels of confidence in prelicensure nursing students as their critical thinking, knowledge, and experience increase as well (Goodstone et al., 2013). Thomas and Mackey (2012) also echoed this recommendation that levels of self-confidence in one's abilities to perform nursing care may be more impacted when HFS simulation is utilized in more advanced courses as a better understanding of theory aids in making clinical decisions.

In general, careful planning on the part of the nurse educator in the selection of teaching strategies to enhance levels of students' self-confidence lead to increased opportunities for student success (Dearmon et al., 2013). The suggestions for the timing of

integrating HFS in nursing curriculum varied. Kimhi et al.'s (2016) study found that the timing, integrating simulation before the clinical experience or at the end of the clinical experience, did not make a difference. Both simulation and the traditional clinical experience positively impact the development of confidence of novice nursing students. Rather, the integration of HFS into a clinical rotation provided additive effects in enhancing nursing students' confidence levels (Kimhi et al., 2016). It is important to note that nurse educators that offer deliberate practice and provide immediate feedback after performance in a simulated experience, regardless of the level of fidelity, lead to mastery of performance (Owen et al., 2017). According to Bandura (1994), the mastery of performance is most likely to positively impact the development of self-confidence.

The extensive systematic literature review by Yuan et al. (2011) highlighted that qualitative studies have shown positive outcomes in developing self-confidence when students experience high-fidelity simulation. Yuan et al. (2011) identified a lack of high-quality quantitative evidence to suggest the same. Limitations in the use of HFS as an effective teaching/learning strategy include concerns that novice students may only be able to see specific components for providing patient care rather than seeing the whole picture. Yuan et al. (2011) suggest the need for future research to evaluate the confidence levels of students after they have experienced similar patient encounters to those experienced in the simulation learning environment to determine the effectiveness of HFS.

This DNP project can increase the existing body of knowledge for nurse educators in determining a correlation among teaching strategies utilized and the enhancement of self-confidence among beginning associate degree nursing students developing physical assessment

skills in a community college setting. With budget constraints, limited clinical space availability, and an increasing list of restrictions placed on the skills nursing students may perform while in a traditional clinical setting, evaluating the effectiveness of HFS enhancing levels of confidence as compared to low-fidelity simulation is worth exploring.

Statement of the Problem

Associate degree nursing students at this research institution enter the program with varying levels of self-confidence. Students are quickly immersed within the first eight weeks of the first semester into their first clinical rotation. Clinical experiences cause considerable levels of stress, anxiety, fear, and self-doubt. This decreases levels of self-confidence which threaten student success and patient safety (Bulfone et al., 2016; Moscaritolo, 2009; Payne, Ziegler, Baughman, & Jones, 2015). Nursing faculty at this site are aware of the impact these negative feelings have on developing self-confidence. Faculty have utilized role-play using learner/learner student pairs during the first week of clinical to aid in decreasing levels of anxiety, stress, and fear of unknown situations. This activity was designed to enhance student self-confidence levels when performing physical assessments and prepare students for their first patient care experience. Faculty wished to explore if the integration of high-fidelity simulation prior to their first clinical experience offered a better way to enhance the self-confidence of novice students at this research site.

As a nursing program accredited by the National League for Nursing Commission for Nursing Education Accreditation, this research site must critically analyze teaching strategies each semester to determine the effectiveness of their practice. Nurse educators are responsible for employing the most effective teaching strategies to assist students in meeting

personal learning needs, student learning outcomes (SLOs), and in developing the necessary skills to provide safe patient care. Comparing the effectiveness of role-play versus high-fidelity simulation to enhance self-confidence in this student population helped faculty to determine which teaching strategy was the best practice approach. Creating a safe learning environment that supports students' developing mastery of their new knowledge, psychomotor skills such as physical assessment, and abilities, enhances self-confidence, facilitates student success, increases retention, and improves patient outcomes (Lundberg, 2008; Moscaritolo, 2009). Given the considerable cost differences between these teaching strategies and this research institution's budgetary constraints, it was imperative to determine which is most effective in enhancing student self-confidence.

Purpose of the Project

The purpose of this prospective cross-sectional quantitative comparative study was to measure the outcome of perceived self-confidence among novice nursing students in an Associate of Science in Nursing (ASN) program participating in an individual high-fidelity physical assessment simulation as compared to role-play prior to beginning their first clinical experience. The study used a quasi-experimental design with the aim to determine which confidence-building teaching strategy was most effective in enhancing novice nursing students' self-confidence levels. The development of self-confidence early in the nursing program is important as it assists the learners' development into the role of the professional nurse. Self-confidence is required to develop "strong clinical practice, with reference to skill acquisition, clinical decision-making, professional socialization, collaboration, and autonomy" (White, 2009, p. 106) all of which are desirable attributes of the professional nurse. Self-reflection and

knowing when to ask for help are two critical components students must have in developing their self-confidence, and the nurse educator must create a learning environment that assists the learners in performing these behaviors (White, 2009).

Nursing faculty at this small Midwestern community college have historically provided a low-fidelity simulation experience during orientation activities in the first week of the nursing students' first clinical rotation. This clinical experience, comprised of approximately 60 ASN nursing students, begins after students have successfully completed an eight-week fundamentals didactic course and separate nursing skills lab. Using role-play, a low-fidelity simulation, first-semester ASN students form learner/learner student pairs and role-play completing a physical assessment to simulate the first morning of clinical. Physical assessment is a critical nursing skill that is developed in the first semester and builds throughout the nursing program. As a key component in the nursing process, physical assessment provides nurses and nursing students the opportunity to continuously monitor the patient's health status, which helps promote patient safety. The goals of this simulation were to create a meaningful experience that prepared students for their first patient encounter by increasing self-confidence, decreasing stress and anxiety, and diminishing self-doubt or fears of harming patients. Additionally, nursing clinical faculty were given the opportunity to identify learner needs, answer questions, and provide immediate feedback to improve student performance.

While this school of nursing owns a high-fidelity human patient simulator, a 3G SimMan®, traditionally the ASN students have been introduced to high-fidelity simulation in the second semester of the nursing program. The first-semester nursing faculty wished to measure the level of the ASN students' self-confidence when using a high-fidelity human patient

simulator as compared to continuing the traditional low-fidelity simulation activity. As identified in research and stated previously, nursing faculty must critique teaching practices to determine the effectiveness of the strategy in its ability to positively influence student success through increased levels of perceived self-confidence. The research question for this study was the following: Does integrating an individual high-fidelity physical assessment simulation experience compared to role-play patient simulation using learner/learner student pairs affect the confidence levels of novice nursing students prior to their first patient care experience? The PICOT was stated: In first-semester Associate of Science (ASN) nursing students (P), how does integrating an individual high-fidelity physical assessment simulation (I) compared to role-play patient simulation using learner/learner student pairs (C) affect self-confidence levels (O) prior to their first patient care experience(T)?

Significance of the Project

Determining which teaching and learning strategy is most effective promotes best practice in nursing education. Students have different learning styles and it is incumbent upon the nurse educator to utilize strategies to meet various learner needs. Nursing faculty working with novice nursing students play a significant role in creating opportunities for learning and for students experiencing success in translating newly acquired knowledge, psychomotor skills and abilities into safe, competent clinical practice. These experiences for the nursing student can enhance self-confidence and improve student outcomes. Lack of self-confidence has been related to poor student outcomes, attrition, and concerns for patient safety.

The student learning outcomes (SLO) for this ASN nursing program are based on the Quality and Safety for Education in Nursing (QSEN) and National League for Nursing (NLN)

graduate competencies (Ivy Tech Community College, 2017). The nursing program uses the SLOs “to organize the curriculum, guide the delivery of instruction, direct learning activities and evaluate student progress” (Ivy Tech Community College, 2017, p. 9). Patient safety, as a competency, requires that students’ performance in providing care minimizes the risk of harm to patients; developing clinical reasoning and judgment assists the student in doing so (QSEN, 2017; NLN, 2013).

Faculty desire to incorporate simulation throughout the curriculum to aid in developing the nursing student into the role of a professional nurse. Several motivations for this exist. Faculty recognize that student success drives the success of the nursing program and, more importantly, contributes to the addition of safe, competent nursing graduates practicing within the community. Faculty understand the outcomes of the National Council for State Boards of Nursing (NCSBN) National Simulation study’s recommendations that quality simulation can replace up to 50% of a students’ clinical experience (Hayden et al., 2014). In addition, the National League for Nursing’s vision statement, “Teaching with Simulation,” supports the use of simulation and calls for nurse educators to utilize this as a teaching modality to develop the professional nurse (NLN, 2015a). To maintain accreditation, the school of nursing must meet the accrediting body’s standards as demonstrated by the achievement of SLOs and program outcomes; both are marks for quality.

While there was much research available on prelicensure BSN nursing students, self-confidence, and various types of simulation, there was limited research in determining if integrating individual high-fidelity simulation experiences as compared to role-play focused on physical assessment with ASN nursing students can enhance self-confidence. The timing of this

study was also unique in that it was conducted one week prior to the ASN students' first patient care experience. Little research was available for this timeframe in BSN or ASN nursing students. There is also little evidence on how to best teach prelicensure nursing students nursing skills (O'Brien et al., 2015). This knowledge gap supported the need for further study to determine which teaching and learning strategy was most effective in promoting self-confidence for the first-semester ASN nursing student.

Developing the knowledge, skills, and attitudes of novice nursing students is critical to academic progression and in promoting patient safety in the clinical setting (Lundberg, 2008). Nursing faculty have an opportunity to utilize teaching strategies to enhance nursing students' self-confidence and to intervene early on when students lack self-confidence. Students experiencing an increased level of self-confidence after completing physical assessment simulation activities may be more likely to meet course objectives, student learning outcomes, and program completion. Concerns for patient safety may be minimized as both students and faculty feel more confident in the student's abilities to complete accurate physical assessments and identify changes in the patient's health status. An increased level of self-confidence has been noted to increase the likelihood of a nursing student to initiate care or seek guidance from others in meeting the patient's needs (White, 2009).

While academic success, persistence, and progression are associated with high levels of self-confidence in first-semester associate degree nursing students, low self-confidence is associated with attrition and academic failure (Peterson-Graziose, Bryer, & Nikolaidou, 2013). Academic failure in schools of nursing is defined as students failing to progress or graduate within the maximum timeframe allotted for program completion (Dante, Fabris, & Palese,

2015). The cost of academic failure is multidimensional; it may be emotionally felt not only by the nursing student but also the invested faculty members; financially felt by the educational institutions, local, state, and federal government; and the impact of fewer nursing graduates entering the workforce will likely impact societal needs (Dante et al., 2015; Peterson-Grazioplene et al., 2013). The fear of academic failure among first-year nursing students has been noted to be just as costly in its ability to undermine the self-confidence levels of nursing students (Bowden, 2008).

Several benefits may exist because of the implementation of this DNP project. Each benefit directly leads to another allowing multiple stakeholders to be positively impacted. Identifying which confidence-building teaching strategy is most effective in this target population will allow faculty to intervene early on and assist the students in developing a stronger sense of confidence. The nursing program benefits from having students graduate on time and prepared to confidently and competently provide safe patient care. Graduates of this program with higher levels of self-confidence may transition more successfully into nursing practice and help fill the nursing workforce needs. The community is more confident in the quality of graduates produced by this school of nursing. Patient safety outcomes are more favorable when cared for by a confident nurse. Finally, these findings may fill the gap in the literature and prove helpful for other associate degree nursing programs to integrate the more effective confidence-building teaching strategy within their own school.

Nature, Scope, and Limitations of the Project

The nature of this project was a prospective, cross-sectional quantitative, comparison study. According to Creswell (2012), comparison studies allow the researcher to evaluate how

two groups will differ in the outcome to be measured. The intervention consisted of integrating an individual high-fidelity simulation-based experience compared to the traditional low-fidelity role-play simulation activity focused on physical assessment. The outcome was to measure levels of confidence among first-semester ASN students pre- and post-simulation activity using the Confidence Scale (C-Scale).

A quasi-experimental research design was selected for this DNP study. Quasi-experimental designs are often used in educational settings as convenience samples are available but must remain intact so as not to disrupt the classroom setting (Creswell, 2012). The study aimed to identify which confidence-building teaching strategy, role-play or high-fidelity simulation, was most effective in enhancing beginning nursing students' confidence levels. Non-random sampling was used in the first-semester associate degree nursing student cohort. All students completed the activity as a course requirement, however, participation in this study was voluntary. The independent variables included the integration of individual high-fidelity physical assessment simulation or role-play simulation while the dependent variable was the perceived self-confidence levels of the nursing students.

Once Institutional Review Board approval was received from American Sentinel University and the research institution, data collection took place. Students were asked by a designated college staff member serving as a proxy to participate in this study and complete a survey regarding their confidence in performing a physical assessment on the first day of their first medical-surgical clinical rotation prior to the assigned simulation activity. Students were asked again to complete the same survey at the start of week two prior to engaging in the care for their first assigned patient in the clinical setting.

The Confidence Scale (C-Scale) was selected as the instrument for this DNP project. Permission was obtained to utilize this instrument (S. E. Grundy, personal communication, November 29, 2017). The C-Scale is a 5-question, Likert survey and was developed to focus on one specific skill at a specific point in time. This instrument was selected due to its reliability, validity, and internal consistency in its ability to measure confidence levels of nursing students associated with performing physical assessments (Grundy, 1993). Grundy (1993) noted self-efficacy and confidence as terms used interchangeably, and the conceptual framework for the C-Scale. Grundy (1993) identified the theory of self-efficacy as the theoretical framework for this instrument.

The IBM SPSS Statistics software system was used for statistical analysis and interpretation of data. The independent samples *t*-test was used to compare the cohort using role-play to perform a physical assessment versus those using high-fidelity simulation. According to Tappen (2016), this inferential statistical analysis allows for comparison of the outcome of the perceived level of self-confidence associated with performing a physical assessment to be measured. A paired *t*-test was also performed for each subsample to compare perceived levels of self-confidence pre-simulation and post-simulation activity. Tappen (2016) states that when the same subjects are being compared at two separate times this test is appropriate. The researcher planned to use the Mann-Whitney U in place of the independent samples *t*-test and the Wilcoxon-Signed Rank test in place of the paired *t*-test if the assumptions for normality were violated.

Data was analyzed by the investigator. The information was stored on a password-protected computer and kept in a locked office. A backup copy was saved on a password-

protected thumb drive and locked in a cabinet in a separate secured location. The paper survey forms are in a locked cabinet in a locked office. Data will be kept for 5 years and then properly destroyed.

Scope

The students selected for this project were a convenience sample comprised of first-semester ASN students in a small community college in a Midwestern state preparing to begin their first Medical-Surgical clinical rotation in a long-term care setting. This accessible population was enrolled in this clinical course and required to participate in simulation activities as a course requirement for clinical orientation during week one of the rotation. While the cohort at the time of this study was anticipated to be approximately 60 first-semester nursing students, the accessible population of ASN students was much smaller than expected. Only 50 first-semester nursing students entered this clinical rotation and the accessible population included 32 ASN students that were invited to participate in this study. At this community college, ASN students and practical nursing (PN) students are enrolled in the same first-semester didactic, skills lab, and clinical courses. However, the ASN students have one additional admissions requirement of completing college-level math before entry into the nursing program whereas this course is not required for PN students. This admission criterion is the only known characteristic variance between ASN and PN students at this time and is the reason for only selecting ASN students as the target population. ASN students that were repeating this clinical course were excluded from data analysis as these students have had previous experience in providing patient care in this clinical course and their failure in this nursing course may affect their measured level of confidence. Practical nursing students were

also excluded from data collection but invited to complete the Confidence Scale (C-Scale) on the first day of clinical when the group met on campus for orientation activities prior to the simulation activity. Students were asked to complete a second survey measuring their confidence at the start of week two. This survey was distributed at the beginning of their clinical day at the clinical facility before initiating patient care and performing their first physical assessment on an assigned patient.

Limitations

No control group for this study was utilized as all students were required to participate in simulation activities as part of their clinical orientation. With that said, some ASN students may choose not to participate in the study or fail to complete both surveys which will decrease the overall sample size. Another limitation of this study is that it will be unknown until the time of this study as to the mix of this cohort; there may be an unequal number of students between the groups and within the groups there may be more PN students in one section than the other which will create an uneven number of ASN students in each simulation group. This factor may potentially decrease the statistical power or increase the sampling error of this quantitative study (Creswell, 2012; Tappen, 2016).

Several other limitations could exist. Community colleges tend to have a diverse population of students regarding age, race, gender, and previous employment. Nursing students may have previous patient care experience as a nursing assistant, patient care associate, emergency medical technician, paramedic, or medic in the Armed Forces. While the scope of practice is different, students may have confidence in the interaction with patients in new situations. Conversely, this may not be a variable of concern in that these students may

feel a lack of confidence in their new nursing skills and responsibilities. The diversity of this cohort or lack thereof will not be known until the project receives Institutional Review Board (IRB) approval to be conducted, and students enroll in the course. Past life experience such as previous life events or academic failures may also impact the various levels of self-confidence students report.

While orientation to the new simulation equipment was provided to the cohort using the high-fidelity human patient simulator, using new technology may affect the student's confidence in performing an assessment. Some students dislike role-play may affect the quality of the simulation. The first-semester nursing faculty teaching the fundamentals theory courses and previous nursing skills lab are the same faculty teaching the clinical course. However, because course enrollment is based on the day students register, it is possible that students were assigned a faculty member that they did not work closely with during previous courses. This can affect their confidence level given that working with faculty that students are less familiar with may cause additional stress, anxiety, and decreased self-confidence.

Delimitations

An area of interest that was not measured in this study includes the self-confidence level of ASN students that were repeating the course. Because confidence levels can be negatively impacted by academic failure, it would be interesting to see what the student's confidence level is at the beginning of the clinical course and how integrating an individual high-fidelity simulation-based experience may impact self-confidence since the traditional approach has been to use role-play. Additionally, practical nursing students' self-confidence levels were not measured. This is a population, however, that is worth exploring due to limited existing

research on the impact of simulation and developing self-confidence in performing physical assessments on a student's first assigned clinical patient. The self-confidence of nursing faculty utilizing this new teaching modality was also not included in this study.

The feasibility of the project follows. The Dean for the School of Nursing gave permission for this project (see Appendix A). Additionally, permission was received from the researcher who developed the Confidence Scale (C-Scale) measurement tool that was selected for this project (S. E. Grundy, personal communication, November 29, 2017) (see Appendix B). The study received IRB approval from both American Sentinel University and the community college where the study took place. No funding was required for this study.

Four full-time first-semester faculty were dedicated to teaching this course. However, time was a considerable factor in this project. Training was required for the first-semester clinical faculty in running both the role-play and high-fidelity simulation. Training was needed to prevent any technical difficulties that may arise when using the human patient simulator. Faculty planning was also required the semester prior to running the study to develop a schedule that would allow for half of the cohort to experience an individual high-fidelity simulation during week one of this course. Students needed to be oriented the day of the activity to new equipment and each student needed at least 30 minutes of time allotted to complete their physical assessment, receive feedback from faculty, and an opportunity to have reflective, deliberate practice time to correct any errors that arose. Students did not require any training to participate in role-play as the previous nursing skills lab has already used this teaching strategy.

While this convenience sample did not allow for confidence in generalizing to the target population, information gained from this study may help to answer the research question to determine which confidence-building teaching strategy is most effective in enhancing first-semester ASN students' confidence levels associated with performing physical assessments at this research site (Creswell, 2012; Trochim, 2006). First-semester faculty must make every effort to implement teaching strategies early on that may enhance students' confidence as this may positively affect student success. Ultimately, teaching strategies utilized and the development of students' confidence, knowledge, skills, and abilities along with their success achieved in the nursing program will impact patient safety.

Theoretical Framework

The theory of self-efficacy, developed by Albert Bandura, provided the theoretical framework for this DNP study. "Self-efficacy beliefs determine how people feel, think, motivate themselves and behave" (Bandura, 1994, p. 2). Self-efficacy has been shown to be a predictor for behavior which develops into self-confidence. An individual's belief or confidence in one's abilities to successfully perform a specific task can be the impetus for performing the behavior required; it can also be the deterrent in performing the behavior (Oetker-Black, Kreye, Underwood, Price, DeMetro, 2014). The concept of self-efficacy emerged from Bandura's social cognitive theory, formerly called social learning theory, which acknowledged a strong relationship between person, behavior, and environment (Christian & Krumwiede, 2013). Bandura's theory hypothesized that for performance of the behavior to occur four antecedents to self-efficacy, or self-confidence, are required (see Figure 1): mastery experiences or performance accomplishments, vicarious experiences such as modeling by others, verbal

persuasion such as coaching, and an emotional arousal or physiologic state such as stress (Burke & Mancuso, 2012; VanHorn & Christman, 2017).

Performance accomplishments are the most important antecedents to developing and enhancing self-efficacy and promoting self-confidence. This happens by having repeated opportunities to practice a skill and experience successes or a feeling of mastery (van der Bijl & Shortridge-Baggett, 2001). For some students with a high level of self-confidence, one failure does not interfere with their motivation to accomplish a goal; however, for others not yet established in their confidence, it may affect their ability to learn, grow, be persistent, and attempt the task again (van der Bijl & Shortridge-Baggett, 2001). Vicarious experience involves students observing others perform a skill or complete a task and perceiving they can be successful when comparing their own abilities to others performing the skill (van der Bijl & Shortridge-Baggett, 2001). This modeling or even role-modeling can affect self-efficacy, but it is a passive form of learning; active learning is more powerful in developing a student's sense of efficacy (van der Bijl & Shortridge-Baggett, 2001). Verbal persuasion involves convincing someone of their abilities to be successful. Nurse educators can participate in verbal persuasion by using words of encouragement, giving instructions, and providing meaningful feedback. However, verbal persuasion may not help students if students did not believe they could be successful in the first place (van der Bijl & Shortridge-Baggett, 2001). Emotional arousal or having a physiologic response to a situation such as feelings of excitement or stress and worry can affect confidence and the likelihood a student would engage in performing the task. These feelings are strongly related to previous experiences. Feelings of stress impact success, decrease the ability to learn and affect self-confidence (Bandura, 1994; van der Bijl &

Shortridge-Baggett, 2001). Additionally, stress hampers the internal motivation a student may have in achieving a goal or engaging in an opportunity to perform a skill.

Along with the sources of self-efficacy, decisions in behavior, effort, and persistence of motivation, thoughts, and emotions all impact the development of confidence. Reflective thinking about one's knowledge, skills, and abilities coupled with repeated successes in challenging tasks and the effectiveness of the types of performance strategies that utilized the student's skills act as an internal motivation to perform a behavior. Coping abilities can lower emotional arousal and help control perceived threats when encountering new situations or when confronted by opportunities to perform a task (van der Bijl & Shortridge-Baggett, 2001). The effort required and the persistence in repeating a skill to become successful is affected by the student's level of confidence. Again, a low sense of self-efficacy is likely to deter students from attempting a skill (Bandura, 1994). Students with higher goals for themselves tend to rise to confronting challenges, visualize how to be successful, and use critical thinking to process failures and ways to improve (van der Bijl & Shortridge-Baggett, 2001). Thus, both person and behavior lead to an outcome as seen in Figure 2 (van der Bijl & Shortridge-Baggett, 2001).

The theory of self-efficacy aligned well with this study in that "students who are able to successfully develop clinical skills through experience and observation in a low-stress environment can gain self-efficacy and strive towards mastery of clinical skills" (Van Horn & Christman, 2017, p. 1). It is especially important for novice nursing students to achieve these successes early on to gain the confidence needed to progress through the nursing program and develop into the role of the professional nurse. Educators can create these positive learning situations that help students experience successful performance outcomes. Successes build

confidence; failures undermine confidence especially if the experience occurs before the nursing student has a firm sense in their abilities to provide safe patient care (Bandura, 1994). Both types of simulation in this study, role-play and high-fidelity simulation, provide an opportunity for the mastery of experiences, deliberate practice, feedback to enhance performance, and elevations in the student's self-confidence to occur. However, nurse educators need to determine which type of simulation experience correlates most with enhancing students' self-confidence in being successful when performing their first physical assessment during their first patient care experience. This will allow the educators to utilize the strategy that may have the most potential to impact future nursing students and their beliefs in being successful.

While success is the hope for students in translating new knowledge and skills into safe, clinical practice, failures can have consequences; both for the patient and nursing student. This makes it critically important for nurse educators to create opportunities for students to experience success in a safe learning environment by employing confidence-building teaching strategies such as simulation. Opportunities for performance accomplishments, vicarious learning, verbal persuasion, and emotional arousal are created through simulation experiences.

Other Considered Learning Theories

Several learning theories lend themselves to developing the framework for simulation. Experiential learning theory supports simulation as a learning strategy as students can reflect on their experiences and teachable moments may arise whereby the faculty member can assist the learner by answering questions, correcting behaviors, and linking theory to practice (Jarvill, Jenkins, Jacobs, Astroth, & Pohl, 2017). According to Jarvill et al. (2017), adult learners prefer a

hands-on approach to learning and “prefer learning in non-linear ways” (p. 2). Simulation opportunities become experiential opportunities for learning.

Like the experiential learning theory, transformative learning theory is also related to the student’s experience. Parker and Myrick (2010) stated the underlying theme of transformative learning theory for adult learners is the student’s need to develop the ability to think autonomously. Through lived experience, students develop their understanding of what will likely occur in certain situations. Knowledge, skills, and attitudes can be shaped in simulation based on the transformative learning theory; experiencing a patient care experience even in simulation provides a frame of reference that helps prepare nursing students for the role of the professional nurse (Parker & Myrick, 2010). The critical reflection that occurs in the simulation experience may develop the critical thinking skills needed to provide safe, confident and competent nursing care.

Constructivism theory asserts that learning is developed, and assimilation, accommodation, and construction are processes that occur within the context of learning (Candela, 2012). Students build new knowledge by drawing on their previously acquired knowledge through their personal experience. Students actively seek meaning in the new knowledge, and the experiences allow for their understanding to develop and be open to change (Candela, 2012). Constructivism lends itself to simulation in that knowledge, psychomotor skills and critical thinking skills can be challenged in an experience and students may draw upon their previous experiences to problem solve more effectively. The concept of self-efficacy is found in constructivism (Candela, 2012).

Andragogy or adult education centers on the adult learning theory and is a form of constructivism. This theory acknowledges that adult learners need to find meaning in their learning and understand why the learning is important. Motivation to learn is internally driven, adult learners are self-directed, take responsibility for their learning, and draw on past experiences to better problem-solve in future real-life situations (Candela, 2012). Adult learners prefer to be actively engaged in the learning process. Simulation provides an experience whereby the adult learner can take responsibility for their learning and aim towards meeting the student's personal learning goals.

Authentic learning centers on immersing real-world situations into the academic learning environment allowing educators to prepare students for situations in clinical practice that are complex (Candela, 2012). Authentic learning is linked to experiential learning, constructivism, and andragogy in that all theories center on building knowledge, skills, and attitudes from past experiences within the framework of the current situation (Candela, 2012). Again, students value finding meaning in their learning, and this internally motivates the desire to learn and grow skills important to clinical practice. Simulation provides the medium for learners to prepare for real-world situations.

Definition of Terms

To provide clarity in understanding the key terms and concepts that are at the center of this DNP study, the following definitions are offered:

Self-confidence: A belief or trust in one's abilities (White, 2009). Self-confidence is a trait that is specific to a situation (Grundy, 1993). Self-confidence is known to be used interchangeably with self-efficacy in literature (Grundy, 1993; White, 2009)

Self-efficacy: A belief one has in the ability to successfully complete tasks and achieve goals (Bulfone et al., 2016).

Simulation: An event or situation that is designed to reflect clinical practice (Billings & Halstead, 2012).

Novice nursing student: A beginner or inexperienced nursing student (Merriam-Webster Dictionary, 2017). In terms of this study, a novice nursing student is a student in his or her first semester of the prelicensure ASN nursing program.

Associate of Science in Nursing (ASN): A two-year prelicensure nursing degree program for students aspiring to become Registered Nurses (RN). The college program prepares qualified students to take the National Council Licensure Exam (NCLEX). Students that successfully pass the NCLEX-RN may apply for licensure through a state board of nursing to become a licensed Registered Nurse.

Role-Play: A low-fidelity simulation whereby two students work in dyads or learner/learner student pairs to simulate or 'act out' certain roles or situations to develop skills or confidence in dealing with unfamiliar situations that "are momentarily real" (Christiaens & Baldwin, 2002).

High-fidelity human patient simulator: Used as a teaching strategy, this is a whole-body mannequin, or human patient simulator (HPS), operated by an individual using advanced computer software. Patient care treatment and interventions can be practiced in a controlled learning environment allowing the student to practice providing patient care and the HPS simulates a physiological response in real time (Galloway, 2009).

Fidelity: Fidelity in a clinical simulation experience refers to the ability to create an experience that replicates a real-life situation to encourage students to react as they would in a real-life situation (Galloway, 2009).

Summary

Confidence is an important nursing attribute and aids nursing students as they transition into the role of the professional nurse. For nursing students, confidence can be a vital component for student success and is cited as a desired outcome as students with higher levels of confidences are more likely to be effective nurses (Brown et al., 2003). Confidence is the belief in one's ability to be successful in performing a task, and the mastery of nursing skills can be realized when students have opportunities to practice basic skills in a non-threatening environment whereby feedback and support can be offered to students. These opportunities increase the potential for students to experience success which in turn builds student self-confidence. Students with higher levels of self-confidence are more likely to engage in opportunities to provide care, seek help from others when challenges arise, be internally driven to meet personal learning goals and course objectives, and persevere when successes do not come easily. Novice nursing students come into nursing programs with various levels of confidence, and nurse educators play a key role in assisting learners to develop their confidence early in the program as they learn to apply new knowledge, skills and abilities into safe, competent nursing practice in the clinical setting. Entering the clinical practice setting causes considerable levels of anxiety, stress, fear of harming patients or failing to meet the expectations of others, all of which challenges the student's level of confidence, can put the patient's safety in harm's way, and threatens the student's belief that he or she can be

successful. Nurse educators must create meaningful learning opportunities for nursing students to learn and grow in their confidence and clinical competence. These learning opportunities help to shape the growth of autonomy in clinical decision-making skills and minimize risk to patient safety.

Simulation is an innovative teaching strategy that provides a rich, experiential learning opportunity immersing nursing students into a clinical practice experience within a safe, learning environment. Both low and high-fidelity simulation meets various learning style needs of students and have been shown to increase self-confidence levels of students across various levels of prelicensure nursing programs. The use of simulation as an adjunct to traditional clinical practice experience has been validated by the NCSBN's National Simulation study, and the NLN's vision statement, "Teaching with Simulation," challenges nurse educators to embrace this innovative technology as a teaching-learning strategy (Hayden et al., 2014; NLN, 2015a). Simulation provides an opportunity to give students learning experiences that may not be possible in the traditional clinical setting given the higher acuity of patients, the limited space at clinical facilities, or restriction in the types of skills nursing students may perform in the clinical setting. Simulation also assists schools of nursing challenged to increase enrollment while dealing with the realities of limited nursing faculty and budgetary resources.

Given all the benefits that simulation provides for students attempting to gain knowledge, skills, and abilities necessary to provide safe, confident and competent nursing care, gaps in knowledge from research exist. The review of literature has identified that low and high-fidelity simulation can increase confidence levels of nursing students but has failed to identify the most effective confidence-building teaching strategy for nurse educators to utilize

in novice nursing students in an ASN program. The literature review has also failed to identify the best teaching practice for nurse educators to employ to increase levels of confidence for first-semester ASN students entering their first clinical experience. The purpose of this prospective, cross-sectional quantitative comparative Doctor of Nursing Practice (DNP) project was to determine which confidence-building teaching strategy, role-play or high-fidelity simulation, is most effective in enhancing novice nursing students' confidence levels. The theoretical framework for this project was Bandura's theory of self-efficacy. This theory hypothesizes that finding success in practicing skills, observing others perform skills, receiving feedback and words of encouragement, and experiencing emotions that affect one's physiologic state all impact the development of self-confidence. These antecedents to developing self-confidence are supported through learning in a simulation. This project provides nurse educators the opportunity to identify which teaching strategy is most effective for first-semester nursing students in an ASN program preparing to enter clinical practice and focusing the simulation scenario on a key nursing skill of physical assessment has the potential to promote patient safety.

SECTION II: METHODS

Introduction

The purpose of this prospective, cross-sectional, quantitative, comparison study was to determine which confidence-building teaching strategy is most effective in enhancing beginning associate degree nursing students' confidence. Students come into the nursing program with various levels of self-confidence. Creating opportunities to enhance a nursing student's self-confidence early on can have a positive effect on both the student and the nursing program (White, 2009). Patient safety can also be positively affected. A gap in literature exists in determining the most effective way to assist nursing students in enhancing their self-confidence (Brown et al., 2003). While high-fidelity simulation has been shown to affect the development of self-confidence among novice nursing students preparing for their first patient care experience (Bremner et al., 2006; Dearmon et al., 2013; Goodstone et al., 2013; Smith & Roehrs, 2009), traditional active learning strategies have also been suggested as being just as impactful (Alfes, 2011; Blum et al., 2010). Nursing faculty must investigate teaching/learning strategies to determine which has the most impact on their nursing program.

The research question was, "Does integrating an individual high-fidelity physical assessment simulation experience compared to role-play patient simulation affect the confidence levels of novice nursing students prior to their first patient care experience?" The Confidence Scale (C-Scale) was utilized to measure the outcome of interest; the perceived self-confidence levels among first-semester associate degree nursing students in performing a physical assessment. Bandura's theory of self-efficacy served as the theoretical framework for this DNP study. Self-efficacy refers to one's belief in accomplishing a certain task or achieving

specific goals (Bulfone et al., 2016; Van Horn & Christman, 2017). Through the mastery of experiences, such as successfully performing a physical assessment, confidence can be developed. Section II expands upon nature, scope, and limitations described in Section I and addresses methods used for this DNP study in greater detail.

Project Design

While several studies have focused on the BSN nursing student and teaching strategies utilized to enhance self-confidence, a gap in literature exists in determining which confidence-building teaching/learning strategy is most effective in enhancing the self-confidence levels among first-semester associate degree nursing students preparing for their first clinical experience. More specifically, determining which teaching strategy, role-play versus high-fidelity simulation, is most impactful on this specific population remains unclear. The project design and research methods sought to identify which teaching strategy better serves the population of students at this research site and has the potential to add to the existing body of knowledge.

Quasi-Experimental Pre-Test/Post-Test Design

This prospective, cross-sectional, quantitative, comparative DNP study used a quasi-experimental pre-intervention/post-intervention survey design and attempted to identify a relationship between the independent and dependent variables (Creswell, 2012). A comparison study allows the researcher to evaluate how two groups will differ in the outcome to be measured (Creswell, 2012). Non-probability strategies were utilized in this quasi-experimental study as non-random sampling was used (Tappen, 2016). According to Creswell (2012), in educational research random sampling is not always possible. Convenience sampling

was selected due to the accessibility, subject availability, and the potential for nonresponse from the ASN students in this cohort (Tappen, 2016).

A cause and effect relationship may be difficult to determine in that the outcome of measure, self-confidence, can be influenced by other previously experienced life experiences and influenced by situations which cannot always be controlled. A true experiment would allow for a control group to serve as the comparison group to the intervention (Tappen, 2016). All first-semester ASN students were required to participate in one of the assigned simulation orientation activities as a course requirement, therefore, no control group was utilized. However, participation in this DNP study was voluntary.

The intervention for this study included the integration of an individual high-fidelity physical assessment simulation as compared to the traditionally used role-play patient simulation at the research site. Both confidence-building teaching strategies served as the independent variables and their effects on self-confidence, the dependent variable, were measured using the Confidence Scale (C-Scale), an ordinal number scale which measures how confident one's feels regarding their performance of a specific task or within a specific situation. In this case, participants identified their level of confidence in performing a physical assessment using the C-Scale survey prior to the assigned simulation activities and repeated one week later prior to the nursing students initiating their first physical assessment on an assigned patient in their first clinical rotation setting. Repeating the survey allowed the primary investigator (PI) to explore the relationship between variables through the quantitative analysis using the outcomes identified on the C-Scale.

Project Planning

All first-semester nursing faculty were involved in planning the schedule for this orientation activity. The PI worked with the faculty to create a simulation schedule for the first week of the rotation. There were six clinical rotations for the first semester; three rotations participated in the role-play simulation that has been traditionally used and the remaining groups participated in the individual high-fidelity physical assessment simulation. Because the integration of an individual high-fidelity simulation was a new activity for this course, the faculty practiced running through this activity several times to ensure consistency in running the scenario and ability to troubleshoot any problems that may arise in using the equipment for the SimMan 3G®.

The faculty loaded a previously created video into each clinical rotation's learning management system that was available to students prior to the orientation day. This video orients nursing students to the simulation lab, reviews the features of the SimMan 3G®, and shows a faculty member demonstrating an assessment using the human patient simulator. This video was available one week prior to the start of the clinical rotation for all first-semester students to view as an orientation activity. All students have performed role-play simulation in their previous nursing skills lab course and have performed physical assessments on their classmates, so no additional training was warranted.

Prior to the start of the clinical rotation, the PI also provided training to the proxy. The proxy was educated to the purpose of the DNP study as well as the protocol in distributing the invitation to participate, the informed consent, and Confidence Scale surveys on the morning of the simulation activity. The proxy was also given a script to read the informed consent to the

nursing students. The proxy was instructed on how to keep the documents secure until the PI could collect the forms. Finally, the proxy was instructed to repeat the distribution and collection of C-Scale surveys again one week later.

Intervention Procedures

After Institutional Research Board (IRB) approval had been granted by American Sentinel University and the research site and informed consent was obtained, the study began. Because the simulation activity occurred during the first week of the Medical-Surgical I clinical rotation, the PI had very limited opportunities for the timing of this study. This study took place during week 9 of the fall semester, and the timeframe was one week. Prior to the start of the assigned simulation activities, approximately 15 minutes were scheduled for the proxy to invite students to participate in the study, distribute the informed consent, demographic, and C-Scale surveys, and allow for students to complete their paperwork.

Role-play

The traditional role-play simulation using learner/learner student pairs took approximately one hour to complete. Students were randomly assigned to the role of nurse or patient. A faculty member gave both verbal and written instructions to each “patient” as to the medical history and present condition of the patient. The scenario was developed more than 4 years ago by the lead clinical instructor who is also the PI for this study to prepare students for their first day of clinical within a long-term care facility. The “nurses” received a change of shift report for their assigned patient from the faculty acting as the charge nurse. The nurses were instructed to complete a head-to-toe physical assessment and then provide the charge nurse a verbal report. While students have been taught in their previous nursing skills lab course to

complete a head-to-toe physical assessment within 5 minutes, students were allowed up to 10 minutes to complete this simulation scenario. Students were permitted to carry a prompt sheet known as the “5 Minute Assessment” (see Appendix G). This document was created at the research site and has been used for several years.

During the simulation, faculty circulated in the lab to observe the performance of each student in order to provide meaningful feedback to the learners. Faculty had the opportunity to choose to take a time-out at any time during the simulation to immediately correct any actions that may potentially cause harm to a patient. At the end of the simulation, faculty and students playing the role of nurse discussed the students’ performance and answered any questions posed by students. By allowing for debriefing, students may better be able to identify individual areas for improvement prior to completing their first physical assessment the following week at the clinical facility. Students were then paired with a new partner and the simulation was repeated to allow all students the opportunity to play the role of the nurse.

Individual High-Fidelity Simulation

The same simulation scenario used in the role-play was also utilized for the individual high-fidelity physical assessment simulation. Each student received a report from the faculty member prior to entering the simulation lab for their individual simulation experience. Students were not permitted to observe their classmate’s performance or share information about their experiences with each other. Students were also afforded up to 10 minutes to complete the head-to-toe assessment and utilize the “5 Minute Assessment” if needed. The faculty member observed the student’s performance and only provide feedback at the end of

the simulation. At that time, students were given the opportunity to ask questions or repeat an aspect of the assessment if needed.

Sample and Setting

The target population included novice nursing students in a prelicensure associate degree nursing program at a small community college in a Midwestern state. A convenience sample of 50 first-semester nursing students preparing to begin their first medical-surgical clinical rotation in a long-term care facility was the subpopulation. Approximately 30 participants are needed to relate variables using a convenience sample in educational research (Creswell, 2015). The accessible population included 35 associate degree nursing students, and each were invited to participate in this voluntary study. The remaining 15 practical nursing students participated in the educational activity as a course requirement but did not participate in this study.

A power analysis was conducted using *G* Power* software to determine sample size. An *a priori* analysis for *t*-test difference between two independent variable means was completed. The analysis indicated a sample size of 42 participants (21 per simulation group) would be needed with a large effect size of .80, power of 80%, and $\alpha = .05$ (Faul, Erdfelder, Buchner, & Lang, 2009). As a result, this DNP study was converted to a pilot study.

At this research institution, practical nursing students and associate degree nursing students are enrolled in the same theory, skills lab, and clinical rotation during the first semester of the nursing program. Admissions criteria differ for these students, therefore, only the associate degree nursing students were selected as the target population. Only associate degree nursing student data were analyzed for this study. Associate degree nursing students

repeating this clinical course were excluded from the data analysis as these students have had previous experience in completing the role-play simulation activity as well as in providing patient care in the clinical course. Their failure in this nursing course could impact their measured level of confidence. Practical nursing students were also excluded from the data analysis.

Non-traditional students in community college settings differ from the typical population at four-year institutions. Variations in age, work experience, and degrees earned make this population quite unique. As such, these lived experiences can have an impact, either positive or negative, on confidence levels as students enter the nursing program. Demographic data such as age, race, and gender were obtained in a survey given prior to the assigned simulation activity and analyzed using descriptive statistics. Additional data elements included previous healthcare-related work experience (ie. certified nursing assistant, patient care technician, certified medical assistant, emergency medical technician, paramedic, or medic in the Armed Forces) and previous educational experience (ie. hold a technical certificate or college degree). Both confounding variables had the potential to impact the perceived level of confidence prior to beginning nursing school (Brown et al., 2003). However, given the new scope of practice requirements, these variables may not necessarily make a difference.

Sampling Strategy

The first-semester cohort was divided in half and course sections were assigned to either complete the required role-play physical assessment using learner/learner student pairs or the individual high-fidelity simulation based on the availability of the simulation lab. While the student's enrollment into either the Monday/Tuesday section or Wednesday/Thursday

section of the clinical course was randomly assigned, non-random groups were assigned for this study based on their clinical schedule. The Monday/Tuesday section consisting of 24 students completed the role-play simulation activity. The Wednesday/Thursday section consisting of the remaining 26 students completed the intervention for this study; an individual high-fidelity physical assessment simulation using the human patient simulator, SimMan 3G[®]. Students enrolled in the medical-surgical clinical course have successfully completed the first eight weeks of the nursing program and have passed both the Fundamentals theory course and the Nursing Skills Lab.

Characteristics of Research Setting

The research site was located in the Midwest and is one of 19 campuses within the statewide community college system. This school of nursing offers a Practical Nursing (PN) program and an Associate of Science in Nursing (ASN) program which includes a transition track, PN-ASN. There are approximately 175 students in the program. Permission was received by the Dean for the School of Nursing (see Appendix A) as she supports the pursuit of this research study so faculty may be able to identify best practice approaches to promote student success.

The research site has a nursing skills lab suitable for the role-play simulation. The nursing skills lab has eight hospital beds, and each is separated by a privacy curtain which helps create a more realistic patient care environment. The School of Nursing also has one simulation lab which houses a high-fidelity human patient simulator (HPS), the SimMan 3G[®], a headboard, and a computer monitor that displays simulated vital signs responses and electrocardiogram activity of the HPS. The HPS simulates breath sounds, abdominal sounds, heart sounds, pulse

points, blinking, and can respond in real time to the nursing interventions employed by the nursing student. A faculty member controls the HPS with the use of a tablet and has the option of preprogramming a series of physiologic responses. Most excitingly, this HPS can communicate with the nursing students. This creates a higher level of fidelity for the nursing students. A control room and separate debriefing area are also located within this simulation lab. Nursing faculty teaching the clinical courses have been trained in the use of this equipment and facilitate their own simulation experiences.

Instrumentation

The instrument selected to measure the outcome of interest was the Confidence Scale (C-Scale). Permission was obtained to utilize this instrument for this study (see Appendix B) (S. E. Grundy, personal communication, November 29, 2017). The C-Scale, while originally made for use in measuring any psychomotor skill, was tested for its reliability and validity in its ability to measure confidence levels of first-semester baccalaureate nursing students associated with performing physical assessments (Grundy, 1993). Cronbach's α ranged from .84 to .93 (Grundy, 1993). Grundy refers to confidence as a trait that is specific to a situation and, therefore, developed the C-Scale to focus on measuring confidence levels specific to one psychomotor skill at one specific time (Grundy, 1993). According to Grundy's (1993) research findings, the scale can measure the "development of this phenomenon (confidence) in nursing students, the factors that influence the degree of confidence, and the effectiveness of specific strategies aimed at increasing the level of confidence during skill performance" (p. 9).

The instrument consists of five statements that are answered using a Likert-type scale (see Appendix C). The statements in Table 1 reflect the students' confidence in performing an

assessment correctly, without hesitation, convincing others of the students' confidence, with self-assuredness, and feeling satisfied in the performance of the skill (Grundy, 1993). Students will circle the number on the 1 (low confidence) to 5 (high confidence) scale corresponding to their perceived level of confidence. Ordinal level measurement will show the degree of confidence. When grouping several statements together in a Likert-type scale to measure a concept such as confidence, a circled response on one single item is less likely to fully identify the level of confidence being assessed (Sullivan & Artino, 2013). Adding the total of the circled numbers will show levels of confidence ranging from 5 (low confidence) to 25 (high confidence) (Grundy, 1993). To make scores more meaningful, categories for total level of confidence scores will be as follows: 5 – 11 (low confidence), 12 – 18 (moderate confidence), and 19 – 25 (high confidence).

Table 1

Items and Directions for the C-Scale

Directions: Circle the number which best describes how you perceive your current ability to perform a head-to-toe assessment on an adult in the hospital. (NOTE: Make sure the circle encloses just ONE number.)

1. I am certain that my performance is correct:
 1. Not at all certain
 2. Certain for only a few steps
 3. Fairly certain for a good number of steps
 4. Certain for almost all steps
 5. Absolutely certain for all steps

Items without sample responses:

2. I feel that I perform the task without hesitation.
3. My performance would convince an observer that I'm competent at this task.
4. I feel sure of myself as I perform the task.
5. I feel satisfied with my performance.

Note. Adapted from "The Confidence Scale: Development and Psychometric Characteristics," by S. Grundy, 1993, *Nurse Educator*, 18(1), pp. 6-9. Copyright 1993 by Susan E. Grundy.

Data Collection

After Institution Review Board (IRB) approval was received from American Sentinel University and the research site (see Appendix E), the primary investigator (PI) proceeded with the study. Efforts were made by the PI to ensure ethical principles and standards were upheld in the process of this study. The process of gaining consent from participants to final data collection will be described.

Students were not informed about this study until the first day of the clinical rotation. On the morning of the scheduled simulation activity, first-semester faculty were not present while the proxy was performing the assigned duties. The proxy distributed an invitation to participate in the study (see Appendix F), directions for creating a personal identification number, the consent form (see Appendix D), the demographic survey, and the Confidence Scale survey, and read the provided script. The script included information about the purpose of the study, how to contact the PI or the PI's Chair if any questions arise, and how to enroll in the study. The proxy informed the students that participation in the study was voluntary and their course grade would not be affected by their participation in this study.

Students were given the opportunity to complete the consent form (see Appendix D) after the instructions were read. The students were then provided a paper/pencil survey to complete which included demographic information. Completing the consent form, demographic survey, and C-Scale took approximately 10 minutes. Students were asked to create an alphanumeric identification number that would only be known by the student and this number was placed by the student on their pre/post-simulation C-Scale surveys. Students

were instructed to use the first three letters of their mother's maiden name and the last three numbers of a phone number as their alphanumeric identification number (ie. WES123).

The proxy collected all documents and place them into a sealed envelope. The proxy then transported the sealed envelope to the School of Nursing office and locked it in a secured cabinet within a locked office until the PI collected the forms. At that time, the PI kept the documents in a locked cabinet in a locked office within the college. After the surveys had been completed, then the first-semester faculty were asked to enter the simulation lab to begin the assigned role-play or high-fidelity simulation activity.

One week later at the clinical facility, a proxy distributed the paper/pencil survey again and collected the forms. The proxy placed all forms in a sealed envelope and kept them in a secured location until the investigator could retrieve the data. Following the completion of the C-Scale, students then engaged in clinical activities and performed their first physical assessment on an assigned clinical patient.

After data collection was completed, only the PI has had access to the information collected and data analysis began. All efforts were made to keep these items secure and will be further described in the data management. The PI will properly dispose of data five years after the completion of this study.

Data Analysis Methods

A codebook was created for both the categorical and ordinal data (see Appendix H). The analysis of data was carried out using the SPSS software and supported by the assistance of the DNP committee members to ensure the best fit and for accuracy. The methods used for the descriptive statistics and inferential statistics will be described. The null hypothesis and an

alternative hypothesis will also be presented. A post hoc power analysis was not completed when results were analyzed as the final sample size was not powerful enough to determine statistical significance (Sylvia & Terhaar, 2014).

Descriptive Statistics

Demographic data such as age, race, gender, previous healthcare-related work experience, and previous educational degree attainment was obtained from the demographic survey collected. The frequency and percentage of these categorical variables will be reported in Section III. Tests to evaluate the distribution of data for normality will be discussed.

Inferential Statistics

Inferential statistics were used to evaluate the relationship among the independent variables, an individual high-fidelity physical assessment simulation experience and a role-play patient simulation, and its impact upon the dependent variable, perceived level of self-confidence as measured by the C-Scale and the results will be reported in Section III. While nonparametric tests are generally used for a Likert-type, ordinal scale, the use of parametric tests can be used (Sullivan & Artino, 2013; Sylvia & Terhaar, 2014). Use of parametric tests requires a normal distribution of data within the same population (Sylvia & Terhaar, 2014). In contrast, nonparametric tests are “assumption free” (Gilbert & Prion, 2016, p. 96).

To answer the research question, pre-simulation and post-simulation scores within and between groups were evaluated. The paired *t*-test was used to compare the means within simulation groups. This parametric test was used to compare the perceived level of confidence as determined by the C-Scale within each simulation group. A paired *t*-test is used when the sample population is the same group and scores are compared at two separate times; before

the simulation and after the simulation (Adamson & Prion, 2014b). A plan was developed should the assumptions for normality be violated. If the assessment for normality was violated, the nonparametric equivalent for the paired *t*-test, the Wilcoxon-Signed Rank test, would be used. An independent samples *t*-test was used to measure the difference in post-intervention mean Confidence Scale scores between each simulation group. This test allows for sample size and variability within the group to be considered to determine if the difference is statistically significant (Adamson & Prion, 2014a). The nonparametric equivalent to the independent samples *t*-test, the Mann-Whitney U, would be used if the assumptions of normality were violated.

Hypothesis

The null hypothesis stated there would be no difference between an individual high-fidelity simulation experience and the role-play simulation in terms of post-intervention levels of self-confidence when performing a physical assessment in first-semester ASN students. The level of significance used to accept or reject the null hypothesis was set at 95% or a *p*-value of $\leq .05$. The alternative hypothesis was that students who participate in an individual high-fidelity simulation experience will have a change/difference in levels of self-confidence in performing a physical assessment after the intervention as compared to those who participated in the traditional role-play simulation.

Data Management Methods

The primary investigator (PI) took steps to ensure confidentiality was maintained and all data related to the study has been kept secure. Students were instructed by the proxy before the simulation activity to create an alphanumeric identification number and place this private

number on their demographic and C-Scale surveys. Instructions were given to use the first three letters of the student's mother's maiden name along with the last three numbers of a phone number (ie. WES123). By having students create their own personal identification number and place it on the surveys, this helped to create anonymity and reduce bias. This personal information was unknown to the PI, and this simple tracking system allowed the PI to complete the statistical analysis and see if any participants withdrew during the study (Tappen, 2016).

The PI entered the personal identification numbers along with the data collected from the demographic and C-Scale surveys into the primary investigator's personal password-protected computer on the SPSS software. The paper survey forms which included the demographic information, the pre- and post-intervention C-Scales, and the consent forms were kept in a locked cabinet within a locked office. A backup copy was saved on a password-protected thumb drive and locked in a cabinet in a separate secure location (Tappen, 2016). All data will be destroyed 5 years after the completion of the study and either shredded and/or incinerated as directed by American Sentinel University policy and the research institution.

Ethical Considerations

Human Subjects Research Social-Behavioral-Education training through the Collaborative Institutional Training Initiative (CITI) was completed as required by American Sentinel University and the research site. All research involving human subjects requires Institutional Review Board (IRB) approval from both American Sentinel University as well as the research institution. The application for IRB approval may be found in Appendix E. Seeking IRB approval ensures that the study has been identified to be one of minimal risk to human

subjects, the likelihood of causing harm to these subjects is no greater than any events occurring in one's ordinary life, and federal guidelines for rules and regulations that concern ethics are being met (Creswell, 2012; Tappen, 2016). This step is critical to ensure the safety of participants and to prevent legal recourse to the investigator, American Sentinel University and the study site as this process aids in identifying any ethical issues that may arise before the implementation phase of the study. A review of the principles of ethical conduct and the investigator's actions to protect human subjects participating in this study will be discussed.

Principles for ethical conduct in research include autonomy, beneficence, nonmaleficence, and justice (Tappen, 2016). Additionally, veracity is equally important. Nursing students were required to participate in the simulation activity as this was a required clinical course activity. However, students were able to make their own decision to participate once well informed by the proxy and in reading the informed consent. Students could withdraw from the study at any time. There was not a control group for this comparative study as preventing any students from potentially experiencing the benefits of the simulation activity to include growing in their knowledge for safe practice, developing psychomotor skills to aid in the delivery of safe patient care, or enhancing the development of their self-confidence could do harm to the student, their success, and patient safety.

Because this study occurred in a clinical course that the primary investigator taught, ethical considerations were reviewed. Creswell (2012) identifies teachers that play a dual role as the researcher must use caution to prevent students from feeling coerced into participating in these studies. Utilizing a proxy to recruit participants decreases the potential for this to occur. The informed consent emphasized that participation was voluntary and that this activity

would not be graded. Refusal to participate in the study did not affect the student's course grade. Measures for anonymity were taken to ensure that the investigator would not know which students chose to not participate in this activity. Anonymity and confidentiality are two steps researchers can take in the design and implementation of the study to maintain an ethical posture.

Data management was also an ethics-related concern with the implementation of this study. The first-semester faculty did not know which students were participating in this study as the simulation activity was a required course activity. Any participant identifying information was removed before data analysis was performed. The use of a personal identification number created by the participant helped to ensure anonymity and reduce bias. All data has been kept in a secure location.

Internal and External Validity

Using a quasi-experimental design for the prospective, cross-sectional, quantitative, comparison DNP study brings several threats to both internal and external validity (Creswell, 2012; Tappen, 2016). This type of design is necessary for the educational setting of this project. Some of these threats can be identified and controlled while others may be unpredictable or uncontrollable. Reducing internal validity and external validity decreases the level of confidence a researcher has in the inferences that may be made from the data analysis and the generalizability of the findings to a population (Creswell, 2012).

Lacking random assignment for the two treatment groups and choosing to use clinical rotations that are intact and cannot be divided based on the number of students in the rotation or personal characteristics such as age, gender, race, or healthcare-related experience threaten

internal validity and external validity. While these personal factors decrease the generalizability of the study's findings to the population, the findings may provide information that helps faculty at the study site determine which teaching strategy may be more appropriate given the student population. Community college settings tend to have a non-traditional student population varying in age, race, gender, and previous work experience. These variants may be similar within and between the groups as well as for future clinical rotations thus reducing but not eliminating the threat.

Other threats to internal validity exist. Concerns for this study include history, maturation, learner effects, statistical regression, selection bias, mortality, instrumentation, discussion of treatments, compensatory rivalry, and subject effects. Efforts needed to minimize or eliminate these threats will be discussed.

History

Events may occur leading up to the time students participate in the study that may affect the level of perceived confidence students have in completing a physical assessment (Creswell, 2012). Likewise, events may occur in the time between students completing the Confidence Scale again one week later. These confounding variables cannot be controlled. Students may feel more stress and anxiety starting a new class. Some students' personalities may cause them to feel less confident in general. These feelings may cause students to note lower levels of confidence when completing the Confidence Scale pre-intervention. These are issues that will be addressed in the discussion of the findings relayed in Section III of the Capstone project. While these factors cannot be controlled, they do need to be acknowledged.

Because all students participating in this study are beginning nursing students, these feelings of stress and anxiety may be experienced in both treatment groups.

Maturation

Study participants change or mature over time (Tappen, 2016). While it is beneficial that only one week separates the pre-intervention survey and post-intervention survey, confidence levels may grow in that time as students develop their skillset in completing a physical assessment. This is a threat to internal validity. However, with students being provided immediate feedback and time to reflect and grow in their skill set during the simulation to prepare for the first day on the clinical unit, it is expected that all students will experience this maturation.

Learner Effects and Instrumentation

Using the same Confidence Scale survey pre- and post-intervention will help decrease the threat to internal validity (Creswell, 2012). However, since the participants are completing the same Confidence Scale survey pre- and post-intervention, this may influence behaviors as seen through Confidence Scale scores and cause learner effects in the post-intervention survey (Lund Research, 2012b). This may confound the results in that the difference in scores measuring confidence (dependent variable) may be due to testing effects and not the type of simulation activity the students completed (independent variables).

Statistical Regression

Selecting students for the sole purpose of causing extreme scores within the group can cause a regression towards the means when noting the change in confidence levels reported pre- and post-intervention (Creswell, 2012). Creswell (2012) states a marked change on the

post-test will always occur. The investigator will not know which, if any, students would have extremely low confidence at the beginning of this study. This threat cannot be controlled.

Selection Bias

The individual differences among the participants (ie. age, gender, race, previous healthcare-related work experience) can introduce bias and decrease internal validity (Creswell, 2012; Lund Research, 2012b). This cannot be controlled but it is assumed that both treatment groups will have variations in these characteristics. Additionally, faculty for this activity may create a selection bias. To control for this, all full-time first-semester faculty teaching in this course are similarly qualified, have been trained in the study protocol, and have a deep understanding of the objectives for the simulation activities and the expectations for the physical assessment skill set that is expected in these students.

Mortality

Mortality occurs when participants drop out of the study (Lund Research, 2012b). While this is uncontrollable to a certain degree as students may call in sick for the clinical day or withdraw from the clinical course within the first week, this may be minimized as a threat because the study occurs during the first week of the clinical rotation. At this study site, it is a program expectation for students to attend clinical days, as absences cannot be made up per program policy. Students are penalized in their clinical course grade when missing clinical days.

Diffusion of Treatments

Preventing students in each clinical group from talking to each other about the simulation activity may be difficult. There is not a control group for this study as this would not be ethical. Both student groups will experience a simulation activity within two days of each

other. Because this type of learning activity simulates patient care, faculty at this study site tell students participating in the simulation that maintaining privacy is the expectation. This may minimize the threat but not eliminate it entirely.

Compensatory Rivalry

Student groups may become competitive when one group feels that they may have the less exciting intervention (Lund Research, 2012b). Students in the first simulation group will complete a role-play simulation to perform a physical assessment. Because this will occur on Monday of the first clinical week, they will not know what the second group will experience. However, the second group on Wednesday will experience a new type of simulation that has not been experienced before by using the SimMan 3G®.

While this group may try to outperform the other, this group may also have increased stress and anxiety associated with using new equipment and being in a new lab. The investigator will create a video and upload it to the course management system that will show students what the lab looks like, how to use the SimMan 3G®, and address the capabilities of the SimMan 3G® during orientation activities prior to the simulation activity. Hopefully, these activities will help address this threat.

Subject Effects

Students may perform differently knowing they are in the study (Lund Research, 2012b). This activity is a course requirement. Students will be told by a proxy that this activity is not being graded. The aim is for students to complete a physical assessment and for faculty to identify students' starting point in performing this skill to help them grow over the course of

the clinical rotation. Students will be given immediate feedback after simulation to facilitate growth in skill. Knowing this may minimize this threat to internal validity.

Threats to external validity are similar to internal validity and include any factors that can decrease the generalizability of the findings to a wider population (Lund Research, 2012a). Using a convenience sample (non-random assignment) decreases the generalizability of findings to the wider population. History effects and maturation, as noted previously, also create threats to external validity (Lund Research, 2012a). Using the Confidence Scale, which has been noted to be both a valid and reliable tool, decreases the threat to the study's validity (Grundy, 1993; Tappen, 2016). While the findings of this study may not be transferable to wider populations, it is hoped that faculty may see relationships between teaching strategies utilized with new nursing students which may assist in enhancing self-confidence levels associated with performing physical assessments.

Summary

The content in Section II described the methods that were used for this prospective, cross-sectional, quantitative, comparison DNP study. A convenience sample was utilized for this quasi-experimental study. However, the final sample size was insufficient according to the G*Power analysis to achieve a power of 80% ($r=0.8$, $\alpha=0.05$, $\beta=0.8$). This design sought to determine if there is a relationship between the type of confidence-building teaching strategy utilized; and individual high-fidelity physical assessment simulation or role-play simulation, and its impact on the perceived level of confidence among first-semester ASN nursing students. By evaluating confidence levels using the C-Scale pre-intervention and post-intervention, the

researcher hoped to determine which teaching strategy is most useful within this population of students.

The SPSS software was utilized to analyze the descriptive and inferential statistics as well as the hypothesis testing. The paired *t*-test was selected to determine the difference in confidence levels within simulation groups and an independent *t*-test was used to evaluate the difference between groups. As previously described, every effort was made to ensure confidentiality and security of the data. A proxy was utilized to ensure students did not feel coerced to participate in the study where the researcher served dual roles as also one of the clinical instructors.

The results and a discussion of the findings will be presented in Section III. While the small sample size and design of the study lacked power and generalizability, the population in focus may reveal findings that may prove helpful for other members of this large statewide community college system that serve similar student populations. This study may also add to the existing body of knowledge. Given the considerable cost differences among the teaching/learning strategies, this study's findings may also assist the research site in making future budgetary decisions.

SECTION III: RESULTS AND DISCUSSION OF FINDINGS

Introduction

For novice nursing students, self-confidence builds with the accumulation of repeated successes. Self-confidence as a concept is important in nursing education as once it is acquired by a nursing student, outcomes such as student success and patient safety are more favorable. Self-confidence is a professional nursing attribute that helps shape the growth of clinical decision-making and safe practice and can positively impact the trusting relationship between the nurse and patient (Blum et al., 2010). Students come into the nursing program with various levels of self-confidence. Creating opportunities to enhance a nursing student's self-confidence early on can have a positive effect on both the student and the nursing program (White, 2009).

The purpose of this prospective, cross-sectional, quantitative, comparison study was to determine which confidence-building teaching strategy was most effective in enhancing beginning associate degree nursing students' confidence. The research question was, "Does integrating an individual high-fidelity physical assessment simulation experience compared to role-play patient simulation affect the confidence levels of novice nursing students prior to their first patient care experience?" The Confidence Scale (C-Scale) was utilized to measure the perceived self-confidence levels among first-semester associate degree nursing students performing a physical assessment simulation at a Midwestern community college.

While confidence has been identified as a professional attribute that positively impacts student success, patient safety, and the nurse-patient relationship, gaps in literature remain in determining which teaching strategy, role-play or high-fidelity simulation, is most effective in enhancing associate degree first-semester nursing student self-confidence (Blum et al., 2010;

White, 2009). The researcher wished to investigate these teaching/learning strategies to determine which had the most impact on the nursing program at the research site. Section III will discuss the major findings of this DNP study and provide an analysis of the research findings. Implications for nursing education practice, contributions to the nursing education profession, and recommendations for future research will be discussed.

Summary of Methods and Procedures

After receiving Institutional Review Board (IRB) approval from both American Sentinel University and the research institution, data collection and the intervention occurred simultaneously. The Dean for the School of Nursing was asked to serve as the proxy for this study. A paper/pencil survey was distributed by the proxy on the first day of the study to gather demographic data and for participants to complete the pre-intervention Confidence Scale survey after they signed the informed consent. The proxy collected the completed surveys, placed them into a sealed envelope, and kept them in a secured cabinet within her locked office until the primary investigator (PI) was able to retrieve the documents. Students then participated in the assigned simulation activity. One week later, the proxy distributed the post-intervention Confidence Scale survey at the clinical facility for participants to complete prior to the start of their first clinical day on the unit. The proxy collected the completed surveys, placed them into a sealed envelope, transported the documents back to the research site, and kept them in a secured cabinet within her locked office until the PI was able to retrieve the documents.

Data Coding, Data Screening, and Data Manipulation

After the two-week period for data collection commenced, the PI began data analysis. A codebook was created for both the categorical and continuous data (see Appendix H). The PI reviewed the paper/pencil surveys and transferred the data into Excel. After reviewing for outliers or missing data, the PI transferred the data into SPSS 24 to complete the process of data manipulation to create new calculated categorical and continuous variables.

Next, the researcher entered demographic data onto Excel and SPSS 24 allowing the process of screening and cleaning data to begin (Pallant, 2016). The researcher reviewed the data for accuracy by looking for any values that may have fallen outside the range of possible values before total scores for any scale could be calculated (Pallant, 2016). For categorical variables, Pallant encourages researchers to check minimum and maximum values along with valid and missing cases. No outliers or missing data were found. Once this process was completed, then the continuous variables were reviewed for accuracy by evaluating if the means scores made sense (Pallant, 2016). After the process of checking for errors was completed, descriptive statistics were ready for analysis.

Using SPSS 24, the researcher then manipulated the data to create a new calculated continuous variable, the total of scores pre-intervention for Questions 1 – 5, and a second calculated continuous variable, the total of scores post-intervention for Questions 1 – 5; each providing an overall score for the Confidence Scale for Group One and Group Two. The total scores could range from 5 – 25 where higher scores would indicate higher levels of confidence according to the directions of the C-Scale (Grundy, 1993). Using SPSS 24 to calculate the mean of pre-intervention and post-intervention total scores allowed for the levels of confidence to be

evaluated for each simulation group. In addition, the researcher evaluated if there was a statistically significant difference in levels of confidence within each group as well as between each group to determine which, if any, teaching strategies may have positively impacted the confidence levels of first-semester associate degree nursing students.

Total Levels of Self-Confidence

Descriptive analysis of Group One's (Role-Play) Total Confidence Scale Score indicated that pre-intervention scores ranged from 12.0 to 23.0 ($M = 18.4$, $SD = 2.68$) with the median level of self-confidence at $Md = 19.0$. Post-intervention scores ranged from 17.0 to 24.0 ($M = 20.3$, $SD = 2.29$) and $Md = 19.5$ using a 95% CI . The total Confidence Scale scores for participants using Role-Play increased from pre-intervention levels to post-interventions levels of self-confidence (see Figure 3).

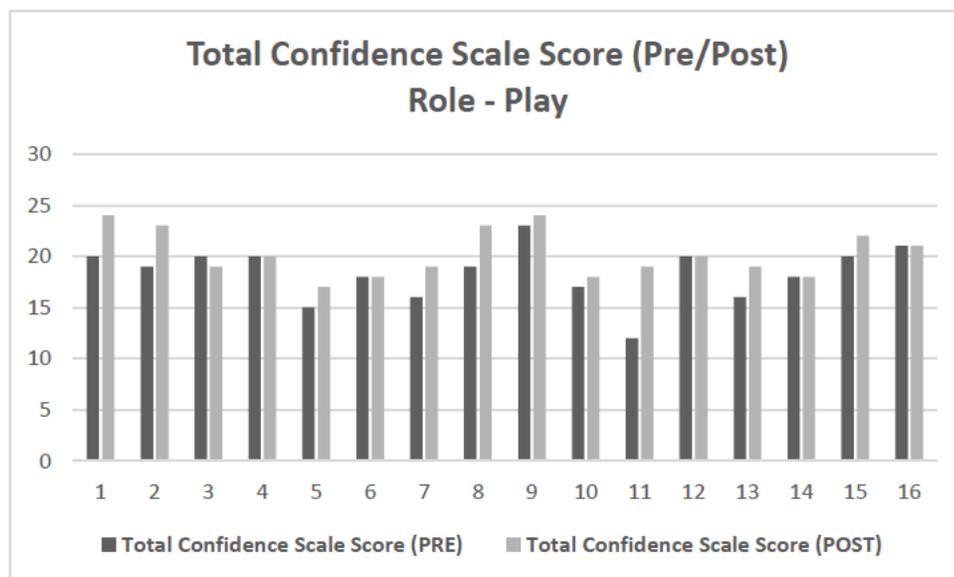


Figure 3. Comparison of Total Confidence Scale scores (pre/post) using Role – Play.

Descriptive analysis of Group Two's (High-Fidelity Simulation) Total Confidence Scale Score indicated that pre-intervention scores ranged from 15.0 – 23.0 ($M = 18.6$, $SD = 2.50$) with

the median level of self-confidence at $Md = 19.5$. Post-intervention scores ranged from 15.0 – 23.0 ($M = 18.8$, $SD = 2.56$) and $Md = 20.0$ using a 95% CI . The Total Confidence Scale Scores for participants using High-Fidelity Simulation essentially remained unchanged from pre-intervention levels to post-intervention levels of self-confidence (see Figure 4).

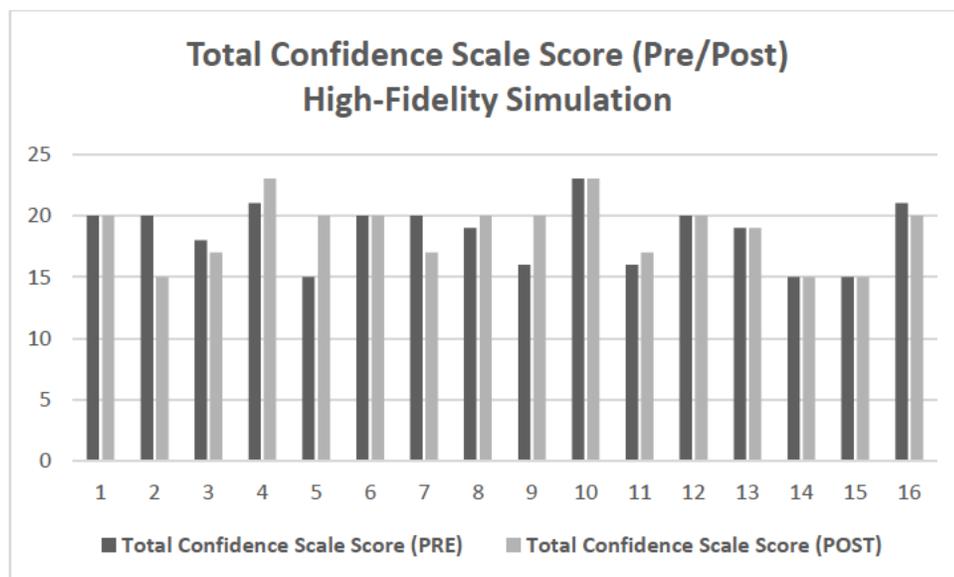


Figure 4. Comparison of Total Confidence Scale scores (pre/post) using High – Fidelity Simulation.

Analysis of Distribution

Preliminary analyses (see Table 2) were performed to assess the distribution of Total Confidence Scale scores within each group. Determining if the distribution of scores were normal for both simulation groups was needed to decide if assumptions of normality were violated (Pallant, 2016). This step allowed the researcher to determine if parametric or non-parametric tests were needed to conduct further inferential statistical analysis.

Role-Play. Analysis revealed that there were no outliers or extreme values on the Total Confidence Scale according to the Boxplot. The pre-intervention original mean ($M = 18.4$, $SD = 2.68$) and the 5% Trimmed Mean (18.5) as well as the post-intervention original mean ($M =$

20.3, $SD = 2.29$) and the 5% Trimmed Mean (20.2) suggested no extreme scores were influencing the mean. As a result, all cases were retained in this data file (Pallant, 2016). Negative skewness (pre-intervention $-.744$, Std. Error = $.564$; post-intervention $.482$, Std. Error = $.564$) was evident with scores clustering at the high-end or to the right of the mean. Pre-intervention scores showed positive kurtosis ($.904$, Std. Error = 1.09) meaning scores were relatively peaked in the center while post-intervention scores showed negative kurtosis (-1.13 , Std. Error = 1.09) meaning scores were relatively flat.

According to Pallant (2016), the Kolmogorov-Smirnov may be used to test for normality for non-parametric statistical analysis. A non-significant result of the Kolmogorov-Smirnov with a Sig. value greater than $.05$ indicates scores are normally distributed (Pallant, 2016). In this sample, the Sig. value for pre-intervention ($.200$) and post-intervention ($.065$) suggested a normal distribution. The Shapiro-Wilk, a test used to determine normality for parametric statistical analysis, revealed pre-intervention ($p = .373$) and post-intervention ($p = .098$) scores came from normally distributed samples as both scores were greater than $.05$. Further evaluation by histogram revealed a peaked distribution which also suggests normal distribution. This was further supported after inspection of the Q-Q plot as scores remained close to the straight line and the Detrended Normal Q-Q Plot showed scores also collecting near the zero line.

High-Fidelity Simulation. Analysis revealed that there were no outliers or extreme values on this scale according to the Boxplot. The pre-intervention original mean ($M = 18.6$, $SD = 2.50$) and the 5% Trimmed Mean (18.6) and post-intervention original mean ($M = 18.8$, $SD = 2.56$) and the 5% Trimmed Mean (18.8) suggested no extreme scores were influencing the mean. As a

result, all cases were retained in this data file (Pallant, 2016). Negative skewness (pre-intervention $-.272$, Std. Error = $.564$; post-intervention $-.116$, Std. Error = $.564$) was evident with scores clustering at the high-end or to the right of the mean and negative kurtosis (pre-intervention -1.002 , Std. Error = 1.09 ; post-intervention $.713$, Std. Error = 1.09) showed scores to be relatively flat.

In this sample, the Kolmogorov-Smirnov Sig. values pre-intervention ($.060$) and post-intervention ($.014$) suggested a change from a normal distribution to non-normal distribution. The Shapiro-Wilk for pre-intervention ($p = .069$) and post-intervention ($p = .041$) scores revealed similar findings of the sample moving from normal to non-normal distribution. Further evaluation by histogram, Q-Q plot, and the Detrended Normal Q-Q Plot supported this change in distribution.

Parametric and Non-parametric Tests

While parametric tests such as the Paired Samples t-test and Independent Samples t-tests tend to be more robust than their non-parametric alternatives (Kim & Mallory, 2014; Pallant, 2016), the Wilcoxon Signed Rank test and the Mann-Whitney U, the researcher decided to include the statistical analysis of both types of tests since all points in time for data collection showed normal distribution except for the post-intervention high-fidelity simulation group. The variation in the post-intervention tests for normality in this group changed from normal to slightly non-normal distribution or $p = .069$ to $p = .041$.

Paired Samples t-test. A paired samples t-test was conducted to evaluate the impact of the role-play physical assessment simulation on students' total Confidence Scale scores. There was a statistically significant increase in the total Confidence Scale scores from pre-intervention (M

= 18.4, $SD = 2.70$) to post-intervention ($M = 20.3$; $SD = 2.30$), $t(15) = -3.50$, $p = .003$ (two-tailed). The mean increase in total Confidence Scale scores was 1.90 with a 95% *CI* ranging from -3.02 to -.73. The eta squared statistic (0.45) indicated a large effect size.

A paired samples t-test was conducted to evaluate the impact of an individual high-fidelity physical assessment simulation on students' total Confidence Scale scores. There was no statistically significant change in the total Confidence Scale scores from pre-intervention ($M = 18.7$, $SD = 2.50$) to post-intervention ($M = 18.6$, $SD = 2.56$), $t(15) = -.320$, $p = .753$ (two-tailed). The mean change in Total Confidence Scale scores was a decrease of 0.1 with a 95% Confidence Interval.

Wilcoxon Signed Rank Test (Non-Parametric Alternative). The Wilcoxon Signed Rank Test revealed a statistically significant increase in total level of confidence following role-play physical assessment simulation, $z = -2.77$, $p = .006$, with a large effect size ($r = .49$). The median score on the Total Confidence Scale increased from pre-intervention ($Md = 19.50$) to post-intervention ($Md = 20.0$).

The Wilcoxon Signed Rank Test revealed no statistically significant difference in the total level of confidence following an individual high-fidelity physical assessment simulation, $z = -.359$, $p = .720$, with a very small effect size ($r = .06$). The median score on the Total Confidence Scale increased from pre-intervention ($Md = 19.5$) to post-intervention ($Md = 20.0$).

Independent Samples t-test. An independent samples t-test was conducted to compare Total Confidence Scale scores post-intervention for the role-play and high-fidelity simulation groups. There was no significant difference in scores for role-play ($M = 20.3$, $SD = 2.29$) and high-fidelity simulation ($M = 18.8$, $SD = 2.56$); $t(30) = 1.67$, $p = .11$ (two-tailed). The magnitude of the

differences in the means (mean difference = 1.44, 95% *CI*: -.320 to 3.20) was large (eta squared = .08).

Mann-Whitney U (Non-Parametric Alternative). The Mann-Whitney U also revealed no significant difference in the post-intervention Total Confidence Scale scores or levels of beginning associate degree nursing student's confidence that performed physical assessments using role-play simulation ($Md = 19.5, n = 16$) and an individual high-fidelity simulation ($Md = 20.0, n = 16$), $U = 96.5, z = -1.21, p = .24, r = .21$ which was a small effect size. No post-hoc testing was warranted on this sample as findings were not statistically significant.

Reliability of Instrument

Cronbach's α was determined to ensure the Confidence Scale was measuring the variable as intended each time the survey was administered. Assessing for reliability helped the researcher determine that both internal consistency and test-retest reliability existed.

According to Grundy (1993), the C-Scale has demonstrated a Cronbach's α between .84 to .93 where values closer to 1 indicate that the instrument is consistently measuring the dependent variable (Kim & Mallory, 2014). While values on a scale greater than .8 are preferred, values greater than .7 are deemed acceptable according to Pallant (2016). In this study, the Cronbach's α ranged from .797 to .895 (see Table 3).

Table 3

Reliability Coefficient Pre/Post-Intervention

Group	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
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Role-Play (PRE)	.895	.902	5
High Fidelity Simulation (PRE)	.843	.862	5
Role-Play (POST)	.797	.773	5
High Fidelity Simulation (POST)	.892	.898	5

Summary of Sample and Setting Characteristics

This DNP study was conducted at a small Midwestern community college which offers practical and associate degree nursing programs. The first-semester cohort consisted of 50 nursing students, not the originally anticipated 60. Fifteen practical nursing students and three associate degree nursing repeating the Medical-Surgical I clinical rotation were excluded from this study. An additional eight associate degree nursing students and two practical nursing students either failed to progress or chose not to enroll in this course which decreased the overall sample size. An *a priori* analysis for *t*-test difference between two independent variables was conducted using *G* Power* software, and it was determined that 42 participants were needed for a large effect size of .80, power of 80%, and $\alpha = .05$ (Faul et al., 2009). While all associate degree nursing students ($N = 32$; 100%) invited to participate in this DNP study consented to have their data analyzed and completed the study in its entirety, this was not enough to achieve the power recommended in the *a priori* analysis. Therefore, this DNP study was converted to a pilot study.

Using a convenience sample of novice nursing students in a prelicensure associate degree nursing program, the accessible population as seen in Table 4 was divided into two groups. Group One was assigned to Role – Play ($n = 16$) simulation and Group Two was assigned

to High – Fidelity simulation ($n=16$). These groups were based on the assigned clinical rotation group predetermined during registration for the clinical course.

Table 4

Number of Participants by Clinical Group

Clinical Group	<i>N</i>	%
One (RP)	16	50.0
Two (HFS)	16	50.0
Total	32	100.0

Note. RP = Role – Play; HFS = High – Fidelity Simulation

See Table 5 for a detailed description of the Group One (Role – Play) and Group Two (High – Fidelity Simulation) sample characteristics. Group One (Role – Play) was predominantly female ($n = 14$; 87.5%), between the ages of 18 – 25 years old ($n = 10$; 62.5%), Caucasian ($n = 16$; 100%), and had no previous secondary education experience ($n = 11$; 68.8%). However, when analyzing the number of participants with previous healthcare – related work experience, a little more than half ($n = 9$; 56.3%) of this group had some degree of previous healthcare – related work experience. Only five (31.3%) participants reported earning a previous college degree.

Group Two (High – Fidelity Simulation) had similar findings. Most were female ($n = 13$; 81.3%), between the ages of 18 – 25 years old ($n = 9$; 56.3%), and Caucasian ($n = 16$; 100%). However, unlike Group One, Group Two had more variability in the level of education achieved with seven (43.8%) reporting a previous college degree, two (12.5%) reporting a previous technical certificate, and seven (43.8%) reporting no previous secondary education experience. More than half ($n = 11$; 68.8%) reported previous healthcare – related work experience.

Table 5

Characteristics of the Participants by Clinical Group

Characteristics	Group One (n = 16)		Group Two (n = 16)		Total	
	N	%	N	%	N	%
Gender						
Male	2	12.5	3	18.7	5	15.6
Female	14	87.5	13	81.3	27	84.4
Age Range						
18 – 25 years old	10	62.5	9	56.3	19	59.4
26 – 35 years old	3	18.8	5	31.3	8	25.0
36 – 45 years old	2	12.5	1	6.2	3	9.4
46 years and older	1	6.2	1	6.2	2	6.3
Race/Ethnicity						
Native American	-	-	-	-	-	-
Asian/Pacific Islander	-	-	-	-	-	-
African American	-	-	-	-	-	-
Spanish/Hispanic/Latino/Mexican	-	-	-	-	-	-
White/Caucasian	16	100.0	16	100.0	32	100.0
Other	-	-	-	-	-	-
Highest Education						
Technical Certificate	0	0.0	2	12.5	2	6.2
College Degree	5	31.3	7	43.7	12	37.5
No previous post-secondary	11	68.7	7	43.7	18	56.3
Healthcare – Related Work Experience						
Yes	9	56.2	11	68.8	20	62.5
No	7	43.8	5	31.2	12	37.5

Note. Group One = Role – Play; Group Two = High – Fidelity Simulation

Major Findings

The purpose of this research study was to determine if integrating a new teaching strategy, an individual high-fidelity physical assessment simulation, as compared to historically used role-play simulation could affect the confidence levels of beginning associate degree nursing students prior to their first patient care experience. Using two-tailed hypothesis testing, the level of significance used to accept or reject the null hypothesis was set at 95% or a p value of $\leq .05$. The null hypothesis was retained as the independent samples t-test revealed $p = .11$. The Mann-Whitney U confirmed this finding with $p = .24$ (see Figure 5). There was no statistically significant difference in post-intervention levels of total self-confidence between the individual high-fidelity simulation or role-play groups.

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Total Confidence Scale Score (POST) is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.239 ¹	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

¹Exact significance is displayed for this test.

Figure 5. Hypothesis Test Summary using Mann-Whitney U

With that said, statistically significant findings were revealed when analysis for changes in the total level of confidence from pre-intervention to post-intervention was measured within groups. The role-play simulation group's pre-intervention scores ranged from 12.0 to 23.0 ($M = 18.4$, $SD = 2.68$) with the median level of self-confidence at $Md = 19.0$. Post-intervention scores ranged from 17.0 to 24.0 ($M = 20.3$, $SD = 2.29$) and $Md = 19.5$ using a 95% CI . As per author instructions (Grundy, 1993), higher total scores indicated higher levels of confidence. This group began with a moderate level of confidence and increased to a high level of confidence.

This increase in confidence levels does provide evidence of the positive impact this teaching/learning strategy may have had within this sample population. These findings echoed those also identified by Blum et al. (2010) where role-play as compared to high-fidelity simulation appeared to show more change in levels of self-confidence among beginning BSN students in a health assessment course.

The high-fidelity simulation group, in comparison, did not show any statistically significant changes in pre-intervention to post-intervention total level of confidence. Surprisingly, individuals scores of some participants ($n = 5$) in this sample population decreased, and almost half ($n = 7$) remained unchanged (see Figure 4). This suggests that high-fidelity simulation did not impact levels of confidence in beginning ASN students as suggested in the literature or postulated by Bandura's theory of self-efficacy. Scores ranged from 15 – 23 out of 25 possible points, and these levels did not change in the post-intervention total scores. Even so, these students had moderate to high levels of self-confidence while performing an individual high-fidelity physical assessment simulation.

Theory of Self-Efficacy

Bandura's theory of self-efficacy (1994) served as the theoretical framework for this study. Bandura's theory identified that with repeated opportunities for learning, achieving success with specific tasks, receiving positive praise, having time for deliberate practice, modeling of others, and feeling the emotions associated with success all could improve future performance by impacting overall levels of confidence in an individual. Feeling confident when performing a physical assessment is critical for both patient safety and comfort. Student

success is also significantly tied to confidence as well. Levels of perceived self-confidence impact the future actions and behaviors of the student nurse.

Several previous studies indicated that Bandura's theory aligned well with the use of high-fidelity simulation as a teaching/learning strategy (Bambini et al., 2009; Bulfone et al., 2016; Cardoza & Hood, 2012; Christian & Krumwiede, 2013; Dunn et al., 2014; Kimhi et al., 2015; Lundberg, 2008; Oetker-Black et al., 2014; Rice, 2015; Roh, 2014; Thomas & Mackey, 2012; Van Horn & Christman, 2017). These studies highlighted how the mastery of skills through active participation in a simulated experience could enhance one's confidence level among prelicensure nursing students. The results of this study, however, did not show similar findings despite the researcher's intentionality in designing a simulation that provided the sources of self-efficacy that Bandura notes are key to the development of self-confidence (Bandura, 1994).

The Confidence Scale measured the level of perceived self-confidence, or self-efficacy, in the performance of physical assessments pre and post-intervention and provided an opportunity to evaluate if a relationship existed in the change of total levels of confidence between groups and the effectiveness of the teaching strategy utilized. The C-Scale was determined to be both a valid and reliable research instrument in measuring the impact of teaching strategies and their impact on confidence levels (Grundy, 1993). In this study, role-play participants experienced an increase in total levels of self-confidence while the high-fidelity simulation group's total levels remained largely unchanged. These findings suggest that role-play may have positively impacted the confidence levels among beginning nursing

students. Using a larger sample size may have allowed the data to be viewed more as statistically significant.

Changes identified within some of the high-fidelity simulation participants who experienced a decrease in self-confidence post-intervention may have been influenced by confounding variables or a disruption in the environment negatively affecting the antecedents as postulated by Bandura's theory which are needed for self-efficacy, the mastery of experience, vicarious experience, verbal persuasion, and physiological state, just prior to his or her first day on the clinical unit. Bandura's theory postulated these antecedents may all impact behavior and change in belief that one may be successful in performing a task or repeating a skill.

As noted in the study by Cardoza and Hood (2012), providing opportunities for students to identify self-efficacy in a skill through high-fidelity simulation can assist the student in identifying deficiencies. This can either enhance or impede future performance of the same task. Stress and anxiety regarding beginning a new course, caring for a real-life patient, or worries in their home-life could have all influenced the changes in level of confidence. Reaching the milestone of beginning their first clinical experience may have led to increased self-doubt, fear, stress and anxiety (Bulfone et al., 2016; Moscaritolo, 2009; Payne et al., 2015). Additionally, working in an unfamiliar clinical environment at a new long-term care facility may also have caused the change. Much of this group of participants were noted to have previous healthcare-related work experience. For some, they may have been more comfortable working in an acute care setting. Since the demographic survey did not ask how recent the participants' work experience was, time may have also been a factor in decreasing their confidence levels.

While the role-play group's experience of increasing self-confidence leading into their first clinical rotation aligned with Bandura's theory that learning in a low-stress environment could build self-efficacy, it is possible that the high-fidelity simulation group participants' encounter with a new technology did not lend itself to the same "safe" learning environment that the role-play group experienced. Using a manikin rather than a human being perhaps did not provide the same level of emotional arousal needed to impact their confidence level. Using this theory, the educator can help to create an environment most suitable for positively impacting the beginning student nurse's development of their self-confidence and one's beliefs in being successful.

Implications for Nursing Practice

While studies were identified in the review of literature that had evaluated the teaching strategies used for this study and their impact on confidence, no study was found to have compared these teaching strategies with this population during the timeframe of the research design. Repeating this study to see if the results would be consistent would be beneficial before making any program changes. Affirmation in the use of role-play, a low-fidelity simulation, at this research institution was realized in a time where the use of high-fidelity simulation is trending and is touted as the teaching strategy or pedagogical approach currently in nursing education with the most impact (Goodstone et al., 2013; Hayden et al., 2014; NLN, 2015a). Cost-conscious administrators and educators can feel confident in the use of this low-fidelity modality in beginning level nursing students who lack context and experience were medium to high-fidelity simulation has appeared to be more impactful in developing confidence and skills for safe practice according to the review of literature. As noted previously, low-

fidelity simulation can promote student learning and confidence while keeping costs low in comparison to higher fidelity simulation technology (Sharpnack & Madigan, 2012).

The findings of this study may also suggest that role-play may be more suitable for novice nursing students that lack context or knowledge and experience as suggested by Blum et al. (2010). The integration of higher fidelity simulation, as noted by Goodstone et al. (2013) as well as Thomas and Mackey (2012), may be more effective in impacting confidence levels as knowledge, experience, and critical thinking skills are developed. Faculty and administration should consider these factors when deciding if high-fidelity simulation is suitable for the novice student nurse.

Evidence-based practice indicates that deliberate practice is key regardless of the type of simulation utilized (Jeffries, Dreifuerst, & Haerling, 2018). Deliberate practice allows students the opportunity to master a skill. Bandura's theory of self-efficacy underscores the use of deliberate practice in that repetitive practice opportunities accompanied by immediate and meaningful feedback along with opportunities to correct performance and repeat the skill lead to mastery; the strongest antecedent for the development of self-confidence (Bandura, 1994).

The researcher recommends that continued use of role-play in beginning nursing students is appropriate given their limited knowledge and experience. However, recommendations would also include integrating high-fidelity simulation into the latter half of this clinical rotation as knowledge and experience grow and students gain context. As high-fidelity simulation has been identified as a best practice teaching strategy (Hayden et al., 2014) and the NLN CNEA (2016), promotes the use of contemporary, best practices in teaching

pedagogies, providing students the opportunity to learn how to utilize this technology, and gain confidence in this modality prior to entering their second semester of the nursing program would be beneficial. Both types of simulation allow for meaningful learning to occur.

Consideration for further training among faculty in the use of higher-fidelity simulation is warranted if faculty confidence has the potential to impact student outcomes when this modality is used. This certainly may have been a factor that could explain why the group of participants using HFS did not experience a statistically significant increase in their post-intervention levels of confidence. Repetition of this study is warranted with a new focus to evaluate the confidence and satisfaction levels among faculty in the use of high-fidelity simulation is needed for administrators and faculty alike to determine if this teaching strategy requires further investment in training of faculty and the upkeep of equipment.

Further consideration also includes repeating this study using both practical nursing students and associate degree nursing students at this research site. These students take all their first-semester courses together. While admissions criteria vary, faculty still use the same teaching practices, have the same course objectives, and work towards the same student learning outcomes with all students. Using the entire cohort comprised of practical and associate degree nursing students may allow for a larger sample size where power could be achieved.

Recommendations

Practice changes made by faculty should always be meaningful, thoughtful, data-driven, and assist the learners in meeting personal goals, course and program outcomes, and geared towards promoting patient safety and comfort. While no statistical significance was noted

between post-intervention total Confidence Scale scores using both teaching/learning strategies, it is important to note students at this research site had successfully completed their previous nursing skills lab and Fundamentals course prior to this clinical rotation with moderate levels to high levels of confidence in performing a physical assessment. Additionally, while the researcher cannot definitively state whether either teaching strategy significantly impacted post-intervention levels of confidence, it can also be said that neither strategy affected the students in an untoward way.

Role-play, as a low-fidelity simulation, is a cost-effective choice in an era where higher education is increasingly challenged by limited resources. However, where possible, the use of high-fidelity simulation should be further explored. Additional training for faculty at this research site is warranted.

The researcher should consider developing an evaluation form for students as well as faculty to complete should this study be replicated in the future. Gaining this valuable feedback would not only provide the researcher a richer understanding of the strengths and limitations to this study but would also provide faculty members at this research institution the necessary data needed to drive practice changes grounded in evidence.

Discussion

The comprehensive review of literature identified both role-play and high-fidelity simulation as confidence building teaching strategies. However, the researcher was unable to find a study that compared these teaching strategies using this population or timeframe of the study. As a result, this study provides a starting point for the researcher to continue to investigate the research problem in future studies.

This study was converted to a pilot study at the research institution due to the small sample size ($N = 32$) with 16 participants in each simulation group. The study also lacked statistical power. Both limitations should be considered when evaluating the overall distribution of scores and lack of statistical significance. Additionally, the research design was cross-sectional only allowing for evaluation of participants at one point in time. Repeating this study with a larger sample size or over an extended period allowing for more data to be captured would be beneficial. Additionally, capturing a larger sample or duplicating this study at more than one research institution may allow for the generalizability of research findings. In this case, the ability to generalize findings was limited. The faculty at this research institution, however, may be able to gain some insight from these findings.

While this study could not replicate findings from other studies in the review of literature which showed statistically significant changes in the students' confidence levels as a result of the simulation activities, a strength of this study was found in the reliability of the instrument used for this research study. The Confidence Scale had a previously established Cronbach's α ranging from .84 to .93 (Grundy, 1993). This study achieved a Cronbach's α ranging from .797 to .895; acceptable values according to Pallant (2016). The stability of this scale indicates that with repeated measures the C-Scale was consistent in measuring the construct and the scores from the C-Scale remained stable and consistent (Creswell, 2012).

Students had previously been exposed to the use of role-play in their prior Nursing Skills Lab course. In comparison, the high-fidelity simulation group was working with new technology. While all students had been oriented to this technology prior to the clinical day via instructor developed orientation videos showing the simulation lab; explaining the capability of

the SimMan 3G[®], as well as the instructor demonstrating a 5-minute physical assessment, students had not actually utilized this equipment. This could account for some of the noted decreases in individual participant post-intervention self-confidence levels.

This DNP study did not support research findings which have indicated HFS generates higher levels of self-confidence in prelicensure nursing students as compared to lower fidelity simulation methodologies (Butler & Brady, 2012; Martin, 2014; Roh, 2014). Preference for HFS due to the ability to create a more realistic learning experience as noted in these previous studies did not appear to hold the same value for this sample population. Since the population consisted of novice nursing students, the level of fidelity may have been irrelevant.

Learner effects and instrumentation may have been a limitation in this study. While using the same Confidence Scale survey within a week's time should have helped to minimize the threat to internal validity, learner effects in the post-intervention survey for the high-fidelity group may have been evident. This effect may have confounded the results in that the differences in scores measuring confidence were more likely due to testing effects and not entirely reflective of the type of simulation activity the students experienced.

Findings from the extensive literature review by Yuan et al. (2011) support the evaluation of students' confidence levels after students have encountered a similar simulation to that of the high-fidelity simulation. While the researcher wished to minimize internal threats to validity, replication of this study with the addition of a third opportunity to reassess confidence levels after the first patient encounter may have been useful. This approach may have provided a clearer picture of the true impact HFS has as a teaching modality to enhance confidence levels in novice students.

Another limitation may have included the faculty member's confidence in completing this new individual physical assessment simulation. While faculty members had previous experience in using the simulation equipment, had practiced running this simulation prior to the clinical day and spent a great deal of time planning the logistics of this clinical activity with the primary investigator, it was still the first time running the scenario with beginning level students. Woodruff et al. (2017) have noted that high-fidelity simulation requires careful planning and effective implementation to be an effective confidence-building teaching strategy. In contrast, all faculty have extensive experience in running the physical assessment simulation and using role-play with nursing students at various levels of the nursing program. Confidence levels among faculty for this teaching strategy were likely higher. The primary investigator should consider evaluating faculty member confidence levels with the use of high-fidelity simulation at this research site if the study were to be repeated.

Additionally, students performing an individual high-fidelity simulation were only given 10 minutes to complete the assessment and an additional 5 minutes of instructor feedback. These students were then encouraged to practice if they determined the need to do so in the open skills lab setting prior to the next clinical week. This timeframe was necessary in order to get all students through the simulation in one clinical day. Further replication of this study may need to consider this limitation and allow for more time to provide instructor feedback and instructor guided deliberate practice.

Most notably, the findings of this DNP study reconfirmed findings from several previous studies (Alfes, 2011; Bambini et al., 2009; Dearmon et al., 2013; & Stroup, 2014) and a major theme of the literature review; low and high-fidelity simulation in a beginning nursing course

are effective teaching modalities to support the development of professional confidence.

While these studies were unable to determine which form of simulation was most effective for this target population, the findings indicated that both types of simulation are useful for students that lack clinical experience, critical thinking skills, and knowledge. Each of these studies suggested situational practice and repetition could lead to enhanced self-confidence. Furthermore, the utilization of any targeted active learning activity focused on developing physical assessment skills in this population would not only aid students in gaining knowledge, experience, and context for future patient encounters, but also provide the opportunities for deliberate practice and repeated successes which Bandura noted to be key in developing self-confidence (Bandura, 1994; Dearmon et al., 2013; Owen et al., 2017; Van Horn & Christman, 2017).

Conclusions and Contributions to the Profession of Nursing

Nursing faculty play a considerable role in positively impacting the development of a novice nursing student's self-confidence through thoughtful and meaningful teaching practices that are data-driven. Employing effective confidence-building teaching strategies early in the curriculum supports the development of confidence as a professional attribute and is critical to student success, patient safety, and patient comfort (Blum et al., 2010; Bulfone et al., 2016; Lundberg, 2008; White, 2009). This DNP study compared the effectiveness of role-play versus high-fidelity simulation in enhancing self-confidence among beginning ASN nursing students performing a physical assessment. While there was no statistically significant difference in post-intervention confidence levels between the two teaching strategies utilized, role-play appeared to promote an increase in levels of self-confidence from pre to post-intervention.

With that said, the findings from the high-fidelity simulation group should not be minimized. This pilot study did not allow for power to be achieved, therefore, further exploration is warranted.

The NCSBN, as well as the NLN, call on nurse educators to embrace simulation to aid in developing the nursing student into the role of the professional nurse (Hayden et al., 2014; NLN, 2015a). Furthermore, the CNEA (2016) calls upon the nursing program at this research institution to infuse the curriculum with contemporary, best practice standards both in nursing educational pedagogies utilized and clinical professional practice taught. As the nursing shortage continues to be a challenge, and clinical site availability becomes increasingly limited, simulation in all levels of fidelity offers an innovative approach to meet the diverse learning needs of students, aids in creating a culture for excellence by implementing best practice approaches, and develops the professional nurse ready to provide safe nursing care. Both confidence-building teaching strategies should be further explored at this research institution.

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Tables

Table 1

Items and Directions for the C-Scale

Directions: Circle the number which best describes how you perceive your current ability to perform a head-to-toe assessment on an adult in the hospital. (NOTE: Make sure the circle encloses just ONE number.)

6. I am certain that my performance is correct:
 6. Not at all certain
 7. Certain for only a few steps
 8. Fairly certain for a good number of steps
 9. Certain for almost all steps
 10. Absolutely certain for all steps

Items without sample responses:

7. I feel that I perform the task without hesitation.
8. My performance would convince an observer that I'm competent at this task.
9. I feel sure of myself as I perform the task.
10. I feel satisfied with my performance.

Note. Adapted from "The Confidence Scale: Development and Psychometric Characteristics," by S. Grundy, 1993, *Nurse Educator*, 18(1), pp. 6-9. Copyright 1993 by Susan E. Grundy.

Figures

Figure 1. Theory of Self-Efficacy. (2017). Retrieved from <https://iedunote.com/self-efficacy-theory>

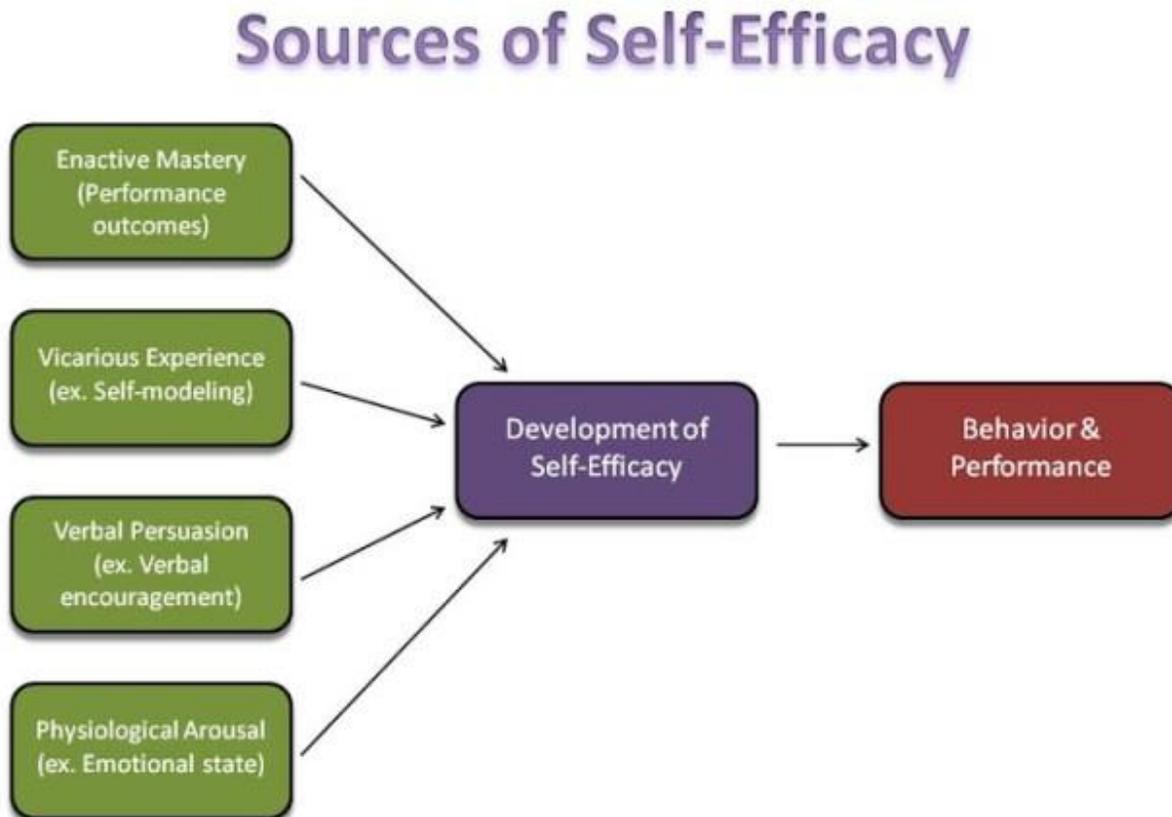
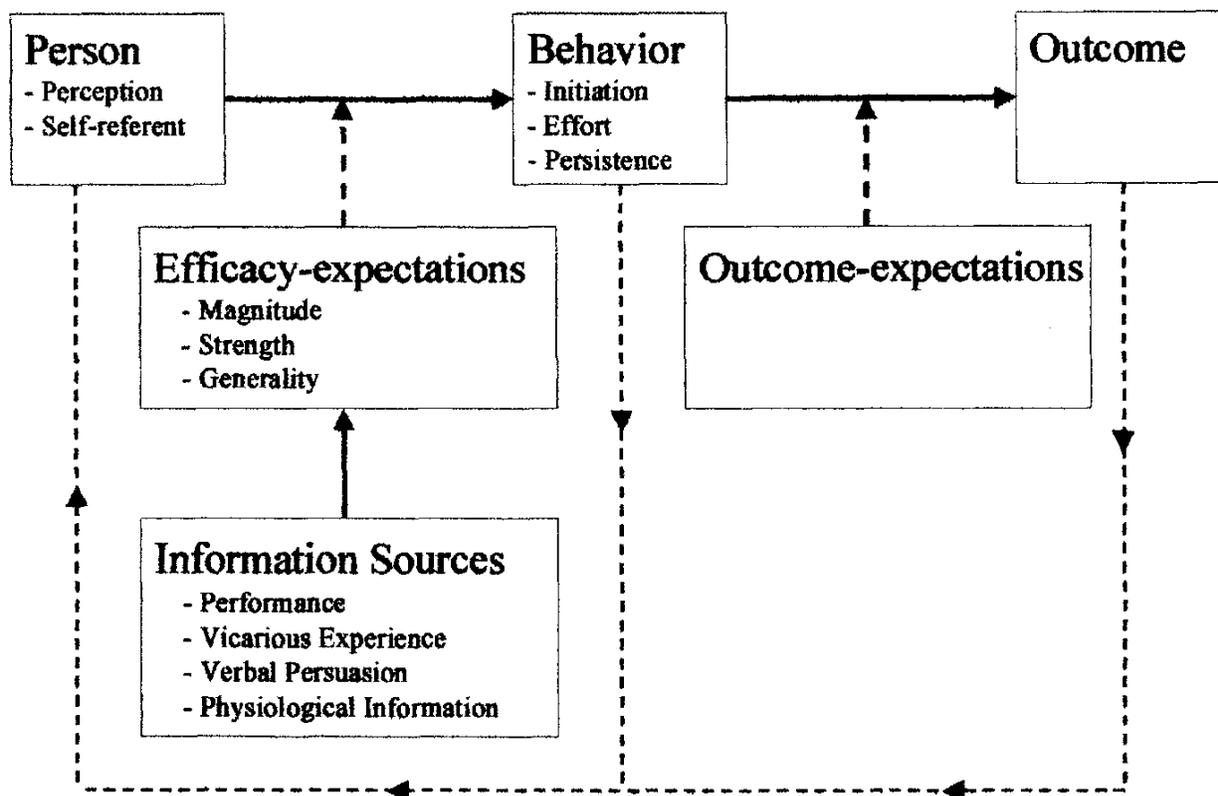


Figure 2. Self-efficacy model. (2001). Adapted from Shortridge-Baggett & van der Bijl.



Appendix A

Permission to Proceed at School of Nursing Pending IRB Approval

(Removed identifying information of Research Site)

From: Gail Lindsay
Sent: Monday, October 30, 2017 12:20 PM
To: Ashley Carter, RN, MSN
Subject: DNP Project

To Whom It May Concern

Ashley Carter's DNP project proposal has been approved by myself as the dean. She will be completing the Community College IRB process for approval as well.


School of Nursing Dean

Appendix B

Permission to Use C-Scale

Permission to Use C-Scale - Ashley Carter (DNP research)

From: [Grundy, Susan](#)

Sent: Wednesday, November 29, 2017 12:32 AM

To: [ashley carter](#)

Subject: Permission to Use C-Scale - Ashley Carter (DNP research)

Dear Ashley: (Ashley Carter, MSN, RN, CNE)

You have my permission to use the C-Scale for your DNP research involving assessment simulation scenarios for new nursing students. The copy I am sending to you has "head-to-toe assessment" listed as the skill. It is very easy to change the skill, the type of patient (pediatric versus adult), or the setting. Please feel free to modify the C-Scale as you wish for your research activity that will focus on nursing students.

The C-Scale is under copyright protection but there is no fee attached to using the instrument. I do ask that you credit me as the developer of the original instrument.

When the subject completes the scale - just add the numbers circled on each of the 5 statements. An individual's score can range from 5 (low confidence) to 25 (high confidence). Do not add the 5 numbers and then divide by 5.

The correct citation of the publication discussing the C-Scale is Nurse Educator (1993), Vol. 18, No. 1, pp 6-9. (The 1992 issue of the article lacked all of the information that I had edited.) The 1993 article contains the information you need on validity etc.

If you have any questions, feel free to email me. If you need a formal letter granting permission to use the C-Scale, let me know.

Research takes a great deal of time and energy and enrolling in doctoral study adds another layer of stress. If not inconvenient, I would love to have an abstract of your findings when you are done. I wish you the best of luck with your research. Thank you for adding to the body of nursing science.

Sincerely,
Susan Grundy, Ed.D., RN
Professor Emeritus
California State University, Sacramento

Also, please let me know if you get this email and that you are able to open the attached copy of the C-Scale.

Appendix C

Confidence Scale (C-Scale)

C-Scale

Directions: Circle the number which best describes how you perceive your current ability to perform a head-to-toe assessment on an adult in the hospital. (NOTE: Make sure that the circle encloses just ONE number.)

1. I am certain that my performance is correct:

1	2	3	4	5
_____	_____	_____	_____	_____
not at all certain	certain for only a few steps	fairly certain for a good number of steps	certain for almost all steps	absolutely certain for all steps

2. I feel that I perform the task without hesitation:

1	2	3	4	5
_____	_____	_____	_____	_____
I have much hesitation	a fair amount of hesitation	a good part of it without hesitation	almost completely without hesitation	absolutely no hesitation

3. My performance would convince an observer that I'm competent at this task:

1	2	3	4	5
_____	_____	_____	_____	_____
not at all	agree, a little	for much of it	for almost all of it	for absolutely all of it

4. I feel sure of myself as I perform the task:

1	2	3	4	5
_____	_____	_____	_____	_____
not at all	very little	for much of it	for almost all of it	for absolutely all of it

5. I feel satisfied with my performance:

1	2	3	4	5
_____	_____	_____	_____	_____
not at all	very little	for much of it	for almost all of it	absolutely satisfied with all of it

Appendix D

Informed Consent

American Sentinel University DNP Capstone Consent Form**Date:****Project Title: Comparing Teaching Strategies Utilized to Enhance Self-Confidence Among First-Semester Nursing Students****Principal Investigator:****Ashley Carter, MSN, RN, CNE****Capstone Advisor:****Sandra Cleveland, Ph.D., RN, CNE****Version #:****Approval Date:** September 6, 2018**Approved Consent is valid for one year from the date of IRB approval.**

You are being asked to participate in a Doctor of Nursing Practice (DNP) student capstone project. This form provides you with information about the project. The project will be described, and all your questions will be answered before you sign this consent. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part in this project.

Why is this project being done?

The purpose of this project is to measure self-confidence levels among first-semester nursing students in an Associate of Science in Nursing (ASN) program participating in an individual high-fidelity physical assessment simulation as compared to role-play patient simulation prior to beginning your first clinical experience. Comparing teaching strategies and associated confidence levels when performing physical assessments may assist the nursing faculty in determining which teaching approach is most effective in enhancing self-confidence.

You are being asked to take part in this project because of the following reasons:

- You are a first-semester Associate of Science in Nursing (ASN) student at the Research Site
- You have successfully completed NRSG 100 (Fundamentals of Nursing) and NRSG 115 (Nursing Skills Lab)
- You have successfully demonstrated how to perform a head-to-toe physical assessment in your previous Nursing Skills Lab course
- You are enrolled in your first clinical rotation in the nursing program (NRSG 105: Medical-Surgical I Clinical)

- You have not performed a physical assessment on an assigned clinical patient at a clinical facility at this point in your nursing education.

Up to 60 first-semester nursing students will take part in this project.

What happens if I participate in this project?

If you agree to take part in this project, you will be asked complete a 5-question survey about how confident you feel in completing a physical assessment before completing your course simulation activity on the first day of clinical. You will be asked to complete the same 5-question survey again at the beginning of week two before initiating patient care activities at the clinical site.

Your participation will last no more than 10 minutes to complete the survey at the beginning of week one during week one in the nursing simulation lab and again at the start of week 2 when you are on the clinical unit.

What are the possible discomforts or risks?

There are no anticipated risks in participating in this project or in completing the survey in this project. **Your participation will not affect your course grade.** The investigator will not know which students are participating in the project or which students have refused to participate in this project. **Your participation is voluntary.** There is no discomfort anticipated with your participation in this program, the time that it will take you to answer the 5-question survey may cause you to experience some discomfort.

Other possible discomforts or risks may include remembering unpleasant events from your past. If you experience any emotional distress because of taking part in this project, and would like to talk with someone, you can speak with the Research Site's licensed mental health counselor which is free and confidential for all students.

Subject Initials

What are the possible benefits of the project?

This project/study is designed to learn more about the integration of high-fidelity simulation (using the SimMan 3G®) as a teaching strategy and how it may assist new nursing students in building their self-confidence when performing physical assessments.

There are no direct benefits to you for participating in this project/study. However, with your participation nursing faculty can learn more about how to best assist new nursing students in building their self-confidence through different teaching strategies. This project may help future nursing students feel more confident in the development of physical assessment skills as students enter their first clinical rotation which may aid in student success. Confidence and effective physical assessment skills in the practice setting promote patient safety.

Who is paying for this project?

There is no funding for this project.

Will I be paid for being in the study? Will I have to pay for anything?

You will not be paid to participate in the project and it will not cost you anything to participate in this project.

Is my participation voluntary?

Taking part in this project is voluntary. You have the right to choose not to take part in this project. If you choose to take part, you have the right to stop at any time. If you refuse or decide to withdraw later, you will not lose any benefits or rights to which you are entitled. If after receiving the survey/questionnaire, you decide to not take part in this project, do not return the survey/questionnaire(s). If I have not received your completed survey(s)/questionnaire(s) within 20 minutes of receiving the survey before the simulation activities begin, I will assume that you decided not to take part in this project and any information received from you will be destroyed.

Who do I call if I have questions?

The principal investigator (student) carrying out this project is Ashley Carter. You may ask any questions you have by calling Ashley Carter or by contacting her at [REDACTED]. If you have questions later, you may contact the principal investigator by calling [REDACTED] or sending an email message.

You may have questions about your rights as someone in this study. You can contact the students' Capstone advisor, Dr. Sandra Cleveland at [REDACTED] by sending a message to the advisors' email address [REDACTED]. You may also contact the American Sentinel University IRB Director ([REDACTED]) or the Associate Dean of Graduate programs with questions about your rights as a research subject at [REDACTED].

Who will see my information?

I will do everything I can to keep your information private (confidential). Any documents that identify you, the consent form signed by you and any information you provide may be looked at by the following:

- The DNP students' Capstone chair and committee members
- American Sentinel University Institutional Review Board (IRB)
- Regulatory officials from the institution where the project is being conducted who want to make sure the research is safe

Subject Initials

The results from this project may be shared at a meeting with the DNP students' capstone committee, at a professional conference, and may also be in published articles. Your name will be kept private when information about this project is presented in any form.

Agreement to be in this study/project

I have read this paper about the project or it was read to me. I understand the possible risks and benefits of this study. I know that taking part in this project is voluntary. I choose to take part in this study/ and I will get a copy of this consent form.

Subject - Signature: _____ Date: _____

Subject -Print Name: _____

Consent form explained by: _____ Date: _____

Print Name: _____

Appendix E

Institutional Review Board Approvals



September 6, 2018

Ashley Carter
DNP Student
American Sentinel University

Re: Comparing Teaching Strategies Utilized to Enhance Self-Confidence Among Novice Nursing Students

Dear Ms. Carter,

On September 6, the Institutional Review Board (IRB) of American Sentinel University has approved the above-referenced submission. The contingencies have been addressed and the IRB approves the protocol. Work on this project may begin. This approval is for a period of one year from the dates of this letter and will require continuation approval if the research extends beyond one year. If you make changes to the protocol during the period of this approval, you must submit a revised protocol to the American Sentinel University IRB for approval before implementing the changes.

If you have any questions regarding the IRB's decision, please contact me through

[REDACTED]

Sincerely,

[REDACTED]

Elaine Foster PhD, MSN, RN
Chair
American Sentinel University IRB

C. Dr. Cleveland



Notice of IRB Determination at Research Site

Institutional Review Board

(Removed identifying information of Research Site)

Study Title: Comparing Teaching Strategies Utilized to Enhance Self-Confidence Among Novice Nursing Students

Protocol Number: 18031

Principle Investigator: Ashley Carter

IRB Reviewer: Emilee Purcell

Date of Correspondence: September 10, 2018

Type of Review:

- Initial Review
- Requested Re-review
- Other

IRB Determination:

- Exempt
 - Does not qualify as research under 45 CFR §46.102(d)
 - Meets Exempt category under 45 CFR §46.101(b)
 - Category 1: Research conducted in established or commonly accepted educational settings involving normal educational practices
 - Category 2: Research involving the use of educational tests, survey procedures, interview procedures or observation of public behavior
 - Category 3: Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under Category 2 but involving public officials or candidates for public office, or federal statute requires confidentiality

Category 4: Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens

Category 5: Research or demonstration projects designed to examine public benefit or service programs; procedures for obtaining benefits or services; possible changes in or alternatives to programs or procedures; possible changes in methods or levels of payment

Category 6: Taste and food quality evaluation and consumer acceptance studies

Expedited Review

Full Review

IRB Review Result

Approved

Denied

Not applicable (exempt)

Review Notes

Your application for the referenced study Protocol Number 18031 has been reviewed and determined to be **Exempt** under 45 CFR §46.101(b). The study will utilize observation of volunteer adult human subject behavior during a course simulation experience. Information will be kept confidential and participants will not be personally identified in the final study report. This study involves no to minimal risks to participants; and data will be reported in the aggregate and not in a way that would identify individual participants.

Please make note of the following:

- Please note that IRB approval does not obligate faculty to participate in your study. If you have not done so already, you will need to secure the cooperation of campus leadership by contacting the Vice Chancellor of Academic Affairs **of each involved campus**. Once you have that authorization, you may proceed with the project as described in your research application.
- This notification should be retained for your records.
- If the protocol changes in a way such that the basis for exemption or approval is no longer accurate, and may no longer conform to the criteria for exemption or approval, a new Initial Review application will need to be submitted. Investigators should contact the IRB office via email prior to making changes in order to confirm that the status will not be affected.
- Exempting an activity from review does not absolve the investigator(s) from ensuring that the rights and welfare of subjects in the activity is protected and that methods used and information provided to gain subject consent are appropriate to the activity.

- Investigators of exempt research are expected to be guided by the ethical principles for all research involving humans as subjects, set forth in the report of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (the "Belmont Report"). For a copy of the Belmont Report, see <http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.htm>.
- Approval of this research does not convey authorization to publish findings that identify the research site (or its students, faculty or staff) as a study participant. As with all research projects conducted among students, faculty or staff, we also request that the research site receive a copy of the final report and analysis, for internal use.

Please contact Molly Chamberlin or Emilee Purcell at with any questions.

Signature of IRB Reviewer:



Emilee M. Purcell, MA

IRB Representative

Appendix F

Invitation to Participate in a Research Study

Dear First-Semester Associate Degree Nursing Student,

I am pursuing a Doctor of Nursing Practice degree through American Sentinel University. As a requirement for this degree, I am conducting a research study to compare teaching strategies and associated confidence levels when performing a physical assessment to assist nursing faculty in determining which teaching approach is most effective in enhancing self-confidence levels among beginning nursing students.

Self-confidence is a belief or trust in one's ability to successfully perform a specific task or accomplish a goal in a specific situation.

I am seeking your assistance in participating in this voluntary study. If you agree to participate, you will be asked to complete a 5-question confidence survey during clinical orientation about how confident you feel in your ability to complete a head-to-toe physical assessment. You will then perform a physical assessment during an assigned simulation activity during the first week of clinical. One week later, you will be asked to complete the same survey on your first day at the clinical facility prior to completing your first physical assessment on your first assigned patient.

The physical assessment simulation activity is a required course activity. However, participation in completing the survey is **VOLUNTARY**. Your grade **WILL NOT** be affected by your participation or refusal to participate in completing the surveys. Your nursing instructors will not see your survey results, and you will create your own participant identification code to ensure the surveys remain anonymous.

If you choose to participate in this research study, please complete the attached informed consent, demographic survey, and confidence survey.

Thank you for your consideration to participate in this research study!

To contact the Researcher with any questions or concerns, please contact:

Ashley Carter, MSN, RN, CNE

████████████████████
Evansville, IN 47710

████████████████████
████████████████████

To contact the Researcher's Capstone Advisor with any questions or concerns, please contact:
Dr. Sandra Cleveland, Ph.D., RN, CNE
American Sentinel University

[REDACTED]

To contact American Sentinel University's Institution Review Board with any questions or concerns, please contact:

[REDACTED]

Appendix G

5 Minute Assessment

As you talk – Level of consciousness

Do they respond to questions appropriately?

Can they maintain eye contact?

Head & Neck - Are eyes red or draining?

Facial expression

What do pupils look like?

Condition of scalp

Mouth, condition of teeth

Tongue and mucous membranes – moist and pink?

Carotid pulses

Upper extremities - Brachial and radial pulses

Skin – temperature, edema, texture, integrity

Hand grasp – level of strength

Capillary refill

Anterior & Posterior

Chest & abdomen - Inspect anterior and posterior chest and back

Apical pulse and breath sounds

Bowel sounds

Inspect, auscultate and palpate abdomen

Legs & Feet -

Assess length and position of each leg (with patient on back)

Femoral, popliteal, pedal pulses

Skin – temperature, edema, texture, integrity

Capillary refill

Have them push their feet against your hand

Appendix H

Project Codebook

Variable Name	Variable Type	Label	Values	Level of Measurement
Student_ID	String-Text	Enter participant identification number (first three letters of mother's maiden name and last three digits of a phone number)	N/A	N/A
Gender	Numeric-Categorical	What is your gender?	1 = Male; 2 = Female	Nominal
Program	Numeric-Categorical	What is your program of study?	1 = ASN; 2 = PN	Nominal
FirstClin	Numeric-Categorical	Is this your first attempt for NRSB 105: Medical - Surgical I clinical?	1 = Yes; 2 = No	Nominal
Group	Numeric-Categorical	Which NRSB 105: Medical - Surgical I clinical rotation are you in?	1 = Monday/Tuesday (Role-play Simulation); 2 = Wednesday/Thursday (Individual High-Fidelity Simulation)	Nominal
Age	Numeric-Categorical	What is your age?	1 = 18 - 25 years old; 2 = 26 - 35 years old; 3 = 36 - 45 years old; 4 = 46 years old and older	Nominal
Race_Ethn	Numeric-Categorical	What is your race/ethnicity?	1 = Native American; 2 = Asian/Pacific Islander; 3 = African American; 4 = Spanish/Hispanic/ Latino/ Mexican; 5 = White/Caucasian; 6 = Other	Nominal

Wk_Exp	Numeric-Categorical	Have you worked or are you currently working in a healthcare-related field? (Examples include Certified Nursing Assistant, Certified Medical Assistant, Patient Care Technician, Emergency Medical Technician, Paramedic, or Medic in the Armed Forces)	1 = Yes; 2 = No	Nominal
Highest_Ed	Numeric-Categorical	What is your highest level of post-secondary education experience?	1 = Technical Certificate; 2 = College Degree; 3 = No previous post-secondary education experience	Nominal
Q1_Pre	Numeric-Categorical	I am certain that my performance is correct.	1 = not at all certain; 2 = certain for only a few steps; 3 = fairly certain for a good number of steps; 4 = certain for almost all steps; 5 = absolutely certain for all steps	Ordinal
Q2_Pre	Numeric-Categorical	I feel that I perform the task without hesitation.	1 = I have much hesitation; 2 = a fair amount of hesitation; 3 = a good part of it without hesitation; 4 = almost completely without hesitation; 5 = absolutely no hesitation	Ordinal
Q3_Pre	Numeric-Categorical	My performance would convince an observer that I'm competent at this task.	1 = not at all; 2 = agree, a little; 3 = for much of it; 4 = for almost all of it; 5 = for absolutely all of it	Ordinal
Q4_Pre	Numeric-Categorical	I feel sure of myself as I perform the task.	1 = not at all;	Ordinal

			2 = very little; 3 = for much of it; 4 = for almost all of it; 5 = for absolutely all of it	
Q5_Pre	Numeric-Categorical	I feel satisfied with my performance.	1 = not at all; 2 = very little; 3 = for much of it; 4 = for almost all of it; 5 = absolutely satisfied with all of it	Ordinal
TCScorePre	Numeric-Continuous	New Calculated Continuous Variable-Total of Scores (PRE)	Total individual scores for all questions (PRE-Simulation)	Interval/Ratio
Q1_Post	Numeric-Categorical	I am certain that my performance is correct.	1 = not at all certain; 2 = certain for only a few steps; 3 = fairly certain for a good number of steps; 4 = certain for almost all steps; 5 = absolutely certain for all steps	Ordinal
Q2_Post	Numeric-Categorical	I feel that I perform the task without hesitation.	1 = I have much hesitation; 2 = a fair amount of hesitation; 3 = a good part of it without hesitation; 4 = almost completely without hesitation; 5 = absolutely no hesitation	Ordinal
Q3_Post	Numeric-Categorical	My performance would convince an observer that I'm competent at this task.	1 = not at all; 2 = agree, a little; 3 = for much of it; 4 = for almost all of it; 5 = for absolutely all of it	Ordinal
Q4_Post	Numeric-Categorical	I feel sure of myself as I perform the task.	1 = not at all; 2 = very little;	Ordinal

			3 = for much of it; 4 = for almost all of it; 5 = for absolutely all of it	
Q5_Post	Numeric-Categorical	I feel satisfied with my performance.	1 = not at all; 2 = very little; 3 = for much of it; 4 = for almost all of it; 5 = absolutely satisfied with all of it	Ordinal
TCScorePost	Numeric-Continuous	New Calculated Continuous Variable-Total of Scores (POST)	Total individual scores for all questions (POST-Simulation)	Interval/Ratio