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Can Simulation Along with Lecture and Demonstration Enhance the Knowledge Level of Managing a Chest Tube for Senior Undergraduate Nursing Students?

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Can Simulation Along with Lecture and Demonstration Enhance the Knowledge Level of Managing a Chest Tube for Senior Undergraduate Nursing Students?

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Dr. Louise Suit, Capstone Chair

EXECUTIVE SUMMARY

Can Simulation Along with Lecture and Demonstration Enhance the Knowledge Level of Managing a Chest Tube for Senior Undergraduate Nursing Students?

Problem Recognition and Definition

Chest tube management is one procedure that has a low occurrence in the clinical area and thus is a high risk for mismanagement. Chest tube mismanagement has the potential or cause another pneumothorax and /or infection. Decreasing the risk of these problems through enhanced education for nursing students is a significant educational outcome. Simulation allows for multiple objectives to be completed without harming patients. Simulation will identify potential problems with chest tubes and will lessen or prevent potential complications from chest tube management.

Purpose

The purpose of the Capstone Project was to demonstrate the impact of simulation technology enhancing the knowledge level of nursing students for chest tube management in patients.

Goals

The goals of the Capstone Project were to improve learning outcomes of chest tube management for undergraduate senior nursing students and to ensure safe high quality care for patients.

Objectives

The objectives of the Capstone Project included improvement in knowledge of chest tube management/application performance of undergraduate senior-level BS nursing students.

Plan

A pre-test/post-test comparative descriptive design was used to determine the impact of simulation technology and/or lecture/media presentation on enhancing the knowledge of nursing students for chest tube management. Pre-test/post-test format was used to evaluate two different teaching methods and the learning outcomes. The intent of the study was to enhance the knowledge level of the nursing students, give direction to improve the overall nursing curriculum, and make changes to better facilitate learning for students.

Outcomes and Results

A two tailed t-test for independent groups was used to test for differences in knowledge levels. Data analysis revealed the mean pre-simulation knowledge of students in comparison group was not significantly different from that of students in the group that did not have simulation (57.8), t (12), 0.454, ($p > 0.05$). However, data analysis within the intervention group revealed significant academic improvement in terms of knowledge measured by posttest exam scores ($p < 0.05$).

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To a true friend forever, Joyce, who never quit believing in me and gave me the strength and courage to go on.

Respectfully and always,

Pamela Lawson

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Can Simulation Along with Lecture and Demonstration Enhance the Knowledge Level of Managing a Chest Tube for Senior Undergraduate Nursing Students?

The Doctor of Nursing Practice (DNP) Capstone Project focused on evidence-based practice, clinical experience, and scholarship to advance the practice. The DNP degree will be the terminal preparation for advanced practice nursing (Chism, 2010). According to Chism (2010), DNP graduates are cutting-edge in their ability to use information technology to improve patient care and outcomes. Knowledge regarding the designing and implementing of simulation can be used to evaluate nursing programs and also the performance of the nursing students to ultimately improve patient outcomes. DNP graduates must develop expertise in utilizing information technology to support leadership and clinical decision making. DNP graduates are prepared to evaluate outcomes of care and quality of care improvement by designing, selecting, using, and evaluating programs related to technology.

The use of simulation can accomplish these specific outcomes for the students and ensure their skills are proficient to care for patients. DNPs become proficient at the skills necessary to evaluate data extraction from practice information systems. The DNP will be prepared to guarantee accountability for the safety and high quality of patient care for both patients and students. As one continues as a DNP, the knowledge and leadership skills will enhance the motivation and continue to explore new technologies in educating the population of students.

Problem Recognition and Definition

The population selected for the DNP Capstone Project was senior students enrolled in the Bachelor of Science in Nursing (BSN) program at a four year university located in the northeastern region of the United States. The university selected for the study offered many baccalaureate nursing programs within this region. Senior students were the group of interest in

the baccalaureate student population for the Capstone Project as they prepare to enter the clinical setting upon graduation and complete the state licensure examination for registered nurses.

The practice problem originated due to the lack of knowledge the nursing students had about chest tubes. Chest tube management was one procedure that has a low occurrence in the clinical area and thus is a high risk for mismanagement. Chest tube mismanagement has the potential to cause another pneumothorax and/or infection. Decreasing the risk of these problems through enhanced education of nursing students was a significant educational outcome.

Statement of Purpose Appropriate for Evidence-based Project

The statement of purpose for this study was to identify the impact of simulation technology enhancing the knowledge level of nursing students for chest tube management in patients. Ultimately the change was needed to provide education for nursing students to ensure safe care for all patients with chest tubes. The practice of nursing was an art and a science which included diverse patterns of knowing with systematic and scientific knowledge to create a safe, caring environment (Reed & Shearer, 2011). Chest tube management was one procedure that has a low occurrence in the clinical area and thus was a high risk for mismanagement. Chest tube mismanagement had the potential to cause another pneumothorax and/or infection. Decreasing the risk of these problems through enhanced education of nursing students was a significant educational outcome supported by the stakeholders of the university. Simulation allowed for multiple objectives to be completed without harming patients. Simulation identified potential problems with chest tubes and lessened or prevented potential complications from chest tube management.

Katz, Peifer, and Armstrong (2010) described advancing the science of nursing education through technology into teaching and learning as essential to prepare nurses for the changing healthcare environment. The population chosen for the DNP Capstone Project was senior

students enrolled in the Bachelor of Science in Nursing (BSN) program at a four-year university located in the northeastern region of the United States. Simulation allowed the students to obtain experience with procedures that occurred infrequently and ultimately enhanced understanding and promoted safe care (Tomey, 2003).

Problem Statement/Change Clearly Identified

One of the problems identified in a needs assessment was the lack of knowledge the nursing students had of managing chest tubes. The only instruction about chest tubes was presented in theory class. The students lacked the knowledge and the understanding of how to properly cared for and managed chest tubes. The use of simulation allowed students to practice chest tube management as many times as they needed to feel comfortable and allowed 'hands-on' experience to care for patients in the clinical settings. Overall, simulation was recognized as a safe way to learn, and most students enjoyed participating (Hallenbeck, 2012).

PICO Articulated and Question

Based on the needs assessment of the chosen population, the information about the population, intervention, comparison, and outcomes (PICO) was developed:

P: At risk senior undergraduate nursing student at a northeastern university in the United States.

I: Educational program for chest tube management using lecture, demonstration and simulation through a patient scenario.

C: Senior-level undergraduate nursing students received lecture information about chest tube management.

O: Improved chest tube management knowledge and skill level following exposure to simulation practice as evidenced by scores on a post-test examination.

Upon completion of the PICO, the following question was developed: Can simulation

along with lecture and demonstration enhance the knowledge level of chest tube management for senior undergraduate nursing students? The purpose of the study was to determine if an educational intervention of either lecture or simulation learning could lead to increased self-efficacy in nursing students. The use of human patient simulation was effective in promoting students' learning processes and thus was deemed an appropriate intervention for this project (Walder & Olson, 2007).

Project Significance, Scope, and Rationale

Increasing patient acuity and complexity of healthcare environments developed high expectations for newly graduating nurses who need to possess strong patient skills and use well-developed clinical judgments when providing patient care. Nurse educators were faced with rapid, systemic, and technical changes that presented challenges for both the faculty and students in preparing nurses for employment. Employers were expecting nurse educators to produce nurse graduates who are ready and prepared to make a rapid transition into the role of a nurse and provide safe and effective care (Katz, Peifer, & Armstrong, 2010). The use of simulation prepared students for the transition of a nurse and demonstrated the knowledge to provide safe and effective care for patients.

The principal investigator for this project was a master's prepared DNP student who was a nurse educator at a northeastern region university in the United States. The principal investigator provided theory and facilitated clinical instruction in the clinical setting. The rationale for the Capstone Project was to better prepare students to manage chest tubes upon entering the workforce as a registered nurse and to provide safe and effective care for the patient population. Patient simulation was suggested as an ideal tool for teaching in the next generation of learners, thus allowing them to engage actively in their learning process while doing no harm to their patients (Sahu & Lata, 2010).

Theoretical Foundation for Project and Change

The theoretical frameworks chosen for the DNP Capstone Project included Benner's Theory (1982) from Novice to Expert Learning; Kolb's Learning Style: a simple self-description based on experiential learning theory designed to measure strengths and weaknesses as a learner (1984); and Lewin's Change Theory of unfreeze, movement, and refreeze for a change to occur (1939).

Benner (2001) noted a sound background in the theoretical underpinning of nursing was necessary for nurses to advance their clinical expertise. She developed a continuum describing the various levels of clinical expertise. Competency was midway between the novice level and the expert level on this continuum. It is the role of the educator to create a learning experience that ties the theoretical underpinning of nursing to clinical experience. Only when a nurse is able to make the connection between the didactic information and clinical experience, will a nurse reach the level of competence.

Students enrolled into the nursing program began at the novice level. Reinforcing the lecture material through the use of simulation enhanced knowledge levels and increased the competency of the students to reach the expert level on Benner's continuum of learning.

Kolb's (1984) experiential learning was conceived as a four stage cycle. The immediate concrete experience was the basis for observation and reflection. Kolb's concept of learning styles involved the learner engaging fully, openly, and without bias in new experiences. The learner must reflect on and observe experiences from many perspectives. The learner must be able to create concepts that integrate into logical theories. The learner must be able to use these theories to make decisions and solve problems.

Lewin's change model generated a practice or system to improve the health of an individual or population. Lewin's theory recognized change as a constant factor of life ensuing

from a dynamic balance of driving and opposing forces. The desired change progressed over three stages: unfreezing, moving, and refreezing. Unfreezing assessed the needs and prepared individuals to move to an improved level of practice (Zaccagnini & White, 2011).

The unfreezing of the traditional classroom lectures to the use of simulation in the laboratory improved the level of knowledge for students and faculty. The improvements were secured, or allowed to refreeze, in order to maintain the desired change for the school's curriculum.

Literature Selection/Systematic Review of Literature/Process Supports Problem

A systematic review of the evidence (SRE) was completed to support the literature for an evidence-based intervention for the chosen population (see Appendix A). The systematic review of the literature for the Capstone Project consisted of three major resources to include: CINHAL, PubMed, and Medline. A total of 35 articles out of the 76 articles were presented in the systematic review table (see Appendix A). The majority of levels ranged from I/I to I/IV. The key words utilized in the search of the systematic review included: nursing education, critical thinking, self-confidence, and undergraduate nursing students. The literature review was used to identify theoretical frameworks, conceptual models, measurements tools, and methods to define study variables.

The nursing education literature supported the use of simulation for assisting students to feel more confident in performing clinical work. The use of simulation supported the curriculum and enhanced the knowledge level and learning of each student as the faculty continued to use simulation throughout the nursing courses (Kaakinen & Arwood, 2009).

Gates, Parr, and Hughen (2012) indicated for the beginning medical/surgical undergraduate students, participation in high-fidelity simulation was positively related to knowledge acquisition, as evidenced by higher scores on content-specific examinations. These

findings supported the use of high-fidelity simulation as a viable substitute for traditional clinical experience and justified the large capital expenditures associated with its implementation and use. This study supported the author's Capstone Project question in the use of technology for teaching the management of chest tubes and increased the knowledge level of the students through examination.

Schlairet (2011) found students made positive comments about the use of simulation in an undergraduate nursing program. It gave them a chance to use current knowledge and also gain understanding of unfamiliar skills. The students were grateful they experienced the simulated scenarios and had not just talk about it. Their confidence was higher and simulation increased decision making, critical thinking, and a sense of accomplishment.

Sinclair and Ferguson (2009) found both lecture and combined lecture and simulation led to perceived increases in self-efficacy for nursing practice. Students reported higher levels of satisfaction with their learning and greater consistency with their learning style. The combination of lecture and simulation were labor intensive and required time and energy to conduct the experience. Students had a positive evaluation of simulation.

Davis and Kimble (2011) stated nursing programs must demonstrate the program outcomes and must reflect the *Essentials of Baccalaureate Education for Professional Nursing Practice*. Simulation was specifically acknowledged as an appropriate educational tool to meet these needs.

McCaughey and Traynor (2010) found simulation was perceived to be a valuable method of learning, which positively impacted clinical effectiveness of nursing students approaching the transition to registered nurses. The participants believed their experience with simulation enhanced the safety of their clinical practice.

Galloway (2012) stated patients trust healthcare providers to care for them safely and skillfully. Nurses must remain faithful to this trust and move forward using simulation techniques available today and develop new techniques for tomorrow.

Waxman (2010) supported clinical simulation as recognized as a teaching method using learning exercises that closely mimic real-life situations. The development of evidence-based clinical simulation scenarios and guidelines for nurses was an important step in redesigning nursing education. The scenarios were created for students to learn in a safe environment. Simulated clinical experience required immersing students in a representative patient-care environment with realism to allow learners to demonstrate their understanding.

Wilford and Doyle (2006) expressed simulation allowed for multiple learning objectives to be taught in a realistic clinical environment without harming patients. Students were exposed to a realistic situation that could be community or hospital based and needed to combine their assessment and clinical decision-making skills with communication, teamwork, and management care for the simulated patient(s). Following the simulation, the learners were able to reflect on their performances with a facilitator. By discussing their areas of strength and development in line with current evidence, they began to improve their competence, and ultimately, confidence. This learning can be consolidated back into practice.

Review of Evidence

Background of the Problem

The alarming rise in complications noted with chest tube management and the lack of knowledge of managing chest tubes heightened the author's concerns about enhancing the knowledge of the nursing students. Nurses and other healthcare providers were under increased scrutiny to provide safe and high quality patient care. Nursing education must develop curricula,

hire qualified faculty, and select learning experiences for students to learn and graduate competent, effective nurses (Durham & Alden, 2008).

Nursing education had long utilized simulation to teach principles and skills of nursing care. Simulation was a relatively new teaching strategy to allow students to develop, refine, and apply knowledge and skills in a realistic clinical situation as they participate in simulated patient care scenarios within a specific environment, gaining experience, learning and refining skills and developing competencies (Durham & Alden, 2008).

Project Plan and Evaluation

Market/Risk Analysis

An analysis of the project strengths, weaknesses, opportunities, and threats (SWOT), (Table 1), was conducted in regards to the Capstone Project. The factors which might have caused threats to the successful completion of the Capstone Project included the following constraints: Stakeholder/faculty "buy –in", budget constraints, timeframe, simulation space, faculty availability, and Institutional Review Board (IRB) approval. Strategies to increase the likelihood of completion of the Capstone Project included discussing the project proposal with administrative personnel at the chosen site of implementation early in the process of the project development, use of existing classroom space and faculty, collaboration with stakeholders, and timely submission of IRB applications.

Table 1

SWOT Analysis

Strengths: -Increase nursing students awareness of the importance of simulation -Improve knowledge and self-confidence of nursing students -Improve nursing school curriculum to facilitate better patient outcomes in caring for patients with chest tubes -Increased cognition

-Decrease frustration in understanding the management of chest tube care
-Increase faculty participation in the use of simulation
-Successful implementation of simulation could improve academic outcomes
-Successful implementation of simulation could improve patient care outcomes
-Stakeholders include: University, administration, faculty, staff, students, healthcare organizations, nursing workforce, patients in healthcare setting
-Collaboration and development of supportive networks within the community

Weaknesses:
-Limited Time
-Small sample size
-Data from one facility
-Lack of volunteers to participate in the study
-Space and availability of equipment
-Lack of additional faculty to help with the simulation portion of the test.
-Lack of consistency with the two groups in the lecture, demonstration.
-Confidentiality not maintained
-Lack of equipment
-Equipment failure

Strategies to Overcome Weaknesses:
-Obtain IRB approval from university conducting the study
-Obtain IRB approval from Regis University
-Obtain permission to conduct simulation in the laboratory area
-Recruit faculty member to assist with the simulation portion of the study. Additional faculty member must complete CITI certification

Opportunities:
-Expand existing education
-Demonstrate understanding
-Proficiency in the written exam to demonstrate knowledge
-Provide debriefing sessions for students to enhance learning/knowledge
-Increase awareness of simulation in the lab
-Involve more faculty members to use the simulation lab
-Students increase in self-confidence
-Students to develop critical thinking

Threats:
-Limited student participation
-Stakeholder/faculty "buy-in"
-Lack of administrative support
-Lack of funding to sustain future interventions

Strategies of Overcome Threats
-Conduct simulation immediately following lecture
-Collaborate with stakeholders and faculty
-Collaborate with administration
-Market the simulation laboratory to outside agencies to generate funding
-Obtain grant monies

Driving/Restraining Forces

Several factors related to the driving force of using simulation in the clinical environment included: creating positive attitudes of the students and the faculty. Simulation increased knowledge and self-confidence in the students. Simulation increased the commitment of the stakeholders as evidenced by students demonstrating their understanding of promoting and providing safe high quality patient care.

Several restraining forces related to simulation included lack of funding, supplies, and equipment. Another important restraining force was the lack of understanding by the faculty and the stakeholders the importance of simulation to improve the nursing curriculum.

Need, Resources, and Sustainability

The need to enhance knowledge levels of nursing students about chest tube management was paramount for the capstone project. The senior students lacked the understanding of managing a chest tube for the safety and quality of patient care. Incorporating simulation into the demonstration of managing a chest tube allowed the students to demonstrate their understanding how to care for a chest tube in a simulated patient.

The resources for the simulation scenario were made available through the simulation laboratory and the setup of the chest tube was produced by the principal investigator. The

simulation equipment functioned without any failure and the students properly performed the chest tube scenario needed to demonstrate how to manage a chest tube safely.

The sustainability of simulation was imperative for the continuation of improving the nursing school's curriculum. Simulation allowed students to practice in a safe environment without harming patients and preparing them prior to entering clinical practice. Simulation met the needs of today's generation technology learning environment.

Feasibility/Risks/Unintended Consequences

The feasibility of providing simulation into the student's clinical education resulted from a "win-win" situation for everyone within the university. Numerous aspects and principles of patient safety were easily incorporated into the education of the students using simulation. The use of simulation promoted effective communication skills, encouraged teamwork, and developed critical-thinking and clinical decision making skills (Durham & Alden, 2008).

There was minimal perceived risk to the students who participated in the study intervention. The intervention occurred in an unscheduled classroom instruction time. To prevent risk for exposure of personal information, the principal investigator was solely responsible for numbering the data to ensure strict confidentiality of study participants.

The unintended consequences might have consisted of simulation equipment failure, lack of sufficient supplies necessary to perform the simulation scenarios, lack of faculty involvement, and support from the stakeholders of the university.

Stakeholders and Project Team

The stakeholders included the School of nursing, undergraduate nursing students, nursing faculty, simulation laboratory, the study university, and future patients of these graduates. The project team was led by the principal investigator (DNP student) with input from DNP Clinical

Mentor, DNP Capstone Chair, and DNP Capstone Faculty. Other members of the project team included the research support personnel who provided the simulation support and office support.

Cost/Benefit Analysis

Costs related to the implementation of the Capstone Project were determined to be minimal due to the use of existing classrooms space, faculty, and designated time for implementation of the use of the simulation laboratory. The benefits of the Capstone Project included the collaboration and development of a supportive team approach in the educational setting for the faculty and the nursing students.

There was minimal cost to the students who participated in the study intervention. The intervention occurred on an unscheduled classroom instruction time. To prevent risk for exposure of personal information, the principal investigator was solely responsible for numbering the data to ensure strict confidentiality of study participants. Study data was stored in a locked box within a locked location. All information will be destroyed after three years by means of shredding upon completion of the capstone project/study. Interpretation of the results was published in accordance with Regis University guidelines.

All participants volunteered for the Capstone Project. There were no alterations in any way to the student's grades for participating in the Capstone Project.

Benefits of the study

Simulation was defined as creating a situation closely related to the "real world" (Cioffi, 2001). Through simulation, nursing students actually practiced and demonstrated their clinical skills, as well as their level of understanding through the use of scenario based situations. Simulation encouraged the student's participation in learning the process to construct knowledge, explore different assumptions, and develop skills in a safe environment (Tomey, 2003). Simulation was utilized in teaching very basic assessment and

psychomotor skills to very complex clinical scenarios and provided experiential learning (Jeffries, 2005).

Benefits due to the increase in knowledge the students were gained from performing "hands-on" practice for patients with chest tubes through the use of simulation. Simulation increased the student's awareness of the importance of simulation. Simulation improved the nursing school curriculum to facilitate students' care for patients with chest tubes.

The Capstone Project occurred in the undergraduate senior educational setting with the intent to enhance knowledge through the implementation and intervention of simulation. The benefits to students included being able to participate in the study and allowed publication of the study data. Ultimately, the goal was to provide the best education for nursing students and to ensure the best and safe care for all patients. Nursing education programs used patient simulation to support the learning of students as they advance in the nursing program.

Mission/Vision/Goals

The mission of this Capstone Project was to implement simulation along with lecture in the undergraduate senior student educational setting in order to enhance the knowledge level of managing a chest tube.

The vision was to decrease anxiety and improve the knowledge of managing chest tubes in the healthcare system and ultimately provide safe patient care. The core values of the Capstone Project included the increase knowledge in managing chest tubes, self-confidence, skills performance, learning, learner satisfaction, critical thinking, and promotion of safe care.

The future outcomes for the Capstone Project included the following goals: Improved knowledge for managing chest tubes, increased self-confidence in caring for patients with chest tubes, and improved safe care of patients with chest tubes. The focus was to identify measurable outcomes for the chosen study population and study intervention.

Process/Outcomes Objectives

The benchmark targets and advanced practice nursing outcomes measured for the Capstone Project included the following goals: Improvement of knowledge in managing chest tubes in the senior baccalaureate nursing students, and increased self-confidence in caring for patients with chest tubes, and improvement of safe care for all patients with chest tubes. The outcomes were chosen from a collaboration effort with the course faculty, DNP clinical mentor, and DNP Capstone Chair. The focus was to identify measureable outcomes for the chosen study population (senior undergraduate baccalaureate nursing students) and study intervention.

The study outcomes were quantified and measure by the following (see Table 2):

1. Improvement of knowledge in managing chest tubes as measured by knowledge retention and application of content on a pre- and post-test on the content of chest tubes (Comparison of test scores).
2. Improvement in Performance Skills in the Simulation lab (Comparison of the pre-test and the post-test scores).
3. Increase in self-confidence and critical thinking skills in caring for a patient with a chest tube (Demonstrated using simulation).

Table 2. *Study Outcomes and Types*

Outcomes	**Type of Outcomes**
Improvement of Knowledge in Managing Chest Tubes	Long Term Learning Outcomes
Improvement in Performance Skills	Long Term Learning Outcomes
Increase in Self-confidence/Critical Thinking Skills	Long Term Learning Outcomes

Logic Model

The conceptual model chosen for the Capstone Project was adapted from of the Logic

Model (Zaccagnini & White, 2011) (see Appendix B). The Logic Model was the required format for the DNP students' Capstone Project at Regis University. The development of the Logic Model occurred during the evaluation planning for the project. The logic model was a picture of how the project developed and how the program worked. It used a series of diagrams to indicate parts of the program that were linked together (Zaccagnini & White, 2011).

Objectives and Research Design

The Capstone Project was a pre-test/post-test comparative descriptive design from the spring 2013 semester. A pre-test/post-test comparative descriptive design was used to determine the impact of simulation technology and/or lecture/media presentation on enhancing the knowledge and skill of nursing students for chest tube management. Pre-test/post-test format was used to evaluate two different teaching methods and learning outcomes for data collection. The independent t-test was analyzed by the use of the Statistical Package for the Social Sciences (SPSS).

Population/Sampling Parameters

The study population was a senior-level nursing students in their last semester of a baccalaureate program at a four year university located in a northeastern region of the United States. The study was conducted after receiving the Institutional Review Board (IRB) approval from Regis University and the study university. The study sample size was a convenience sample determined by the number of students enrolled in the senior class. There were 13 students in the sample size (N=13). The total population included 60 students (n=60).

Setting for Evidence-based project

The setting was appropriate for the Capstone Project and the accessibility for the students was familiar to them. The classrooms were conducive to the learning environment and the simulation laboratory was equipped with the necessary supplies to conduct the chest tube

scenario.

Time Frame

The time frame for the Capstone Project was depicted in the calendar view (see Appendix E). The length of tasks in the DNP Project Process Model (Zaccagnini & White, 2011) included Capstone Project tasks beginning in fall 2011 and ending in spring 2013. The time frame for completion of the Capstone Project was dependent upon IRB approval and the principal investigator was approved for "exempt" status by the IRB.

Budget and Resources

Budget and resources were considered for the Capstone Project. One faculty and existing classroom and simulation laboratory were utilized for the Capstone Project. By using the faculty and facilities, budgetary concerns were not increased. Principal investigator was employed full-time as the Campus Coordinator of the school of nursing. The other faculty were employed full-time as the Simulation Coordinator of the university. Both positions are contracted with a salary based upon nine months of employment. No additional funding sources were required. However, consideration was given in regard to budget and resources necessary to continue and/or replicate the study (see Appendix F).

EBP design and Methodology and Measurement

A pre-test/post-test comparative descriptive design was used to determine the impact of simulation technology and/or lecture/media presentation on enhancing the knowledge of nursing students for chest tube management. Pre-test/post-test format was used to evaluate two different teaching methods and the learning outcomes.

The intent of the study was to enhance the knowledge level of the nursing students, give direction to improve the overall nursing curriculum, and make changes to better facilitate

learning for students. The setting was a simulation laboratory in a School of Nursing located in a large University located in northeastern United States.

Simulation had been used in this nursing program for three years primarily for medical and surgical nursing courses. A Cover Letter was distributed to undergraduate nursing students in their last semester (see Appendix K). A Demographic Data sheet was obtained from all volunteers (see Appendix C). The Principal Investigator (Pamela Lawson) numbered each Demographic Data sheet prior to students receiving the informational packet. The even numbered packets were identified as the students who received the lecture module only and the odd numbered packets were identified as the simulation group of students. A pre-test was administered to the entire group of nursing students in the clinical laboratory classroom at the same time (see Appendix C).

The principal investigator presented a learning module with a demonstration of chest tube management to both groups. The even numbered learning students (n=6) were asked to leave the classroom and return at a later time during the same day. The odd numbered group of learning students (n=7) performed a 15 minute chest tube simulation scenario. The research support person (Mary Anne Ventura) conducted the chest tube scenario on SIM Man 3G and the principal investigator conducted a five minute debriefing session immediately following completion of the simulation scenario. Both groups rejoined in the clinical laboratory classroom and completed the post-test on the same day (see Appendix C).

The groups were asked to complete an evaluation of the project and submitted the results in a sealed envelope without any measures of identifying individuals. After the completion of the post-test, the even numbered group was offered the opportunity to complete the chest tube simulation scenario to enhance their knowledge of chest tube management.

Data were analyzed by an independent t-test using the Statistical Package for the Social Sciences (SPSS). Data was collected and maintained only by the principal investigator. All data were reported as aggregate data with assigned numbers of odd or even by the principal investigator without names attached and data was stored in a confidential manner in a locked box within a locked location. All information will be destroyed after three years by means of shredding upon completion of the capstone project/study. Interpretation of the results will be published in accordance with Regis University guidelines.

Protection of Human Rights

IRB approval as "exempt" review was received from the study university (see Appendix G). IRB approval as "exempt" status was received from Regis University (see Appendix H). The principal investigator received ethics certification after successful completion of the Collaborative Institutional Training Initiative (CITI) human research curriculum for social behavioral research investigators (see Appendix I). The research support faculty and Capstone Chair successfully completed the CITI training. The training was completed prior to initiation of the Capstone Project. Proof of completion in the form of a CITI certificate was submitted to the IRB for Regis University and the study university (see Appendix H). A formal letter was submitted as per requested by the IRB personnel for permission to conduct the simulation within the study university (see Appendix J).

Subjects voluntarily participated in the study and could withdraw at any time. A cover letter with information about the study was given to participants and a consent form signed (see Appendix K). Participating in the study had minimal risks to subjects. Should anxiety or a problem have happened from participation in testing or simulation, the subject would have been referred for counseling though the proper university procedure. No referrals were made.

Instrumentation Reliability/Validity and Intended Statistics

Upon the completion of data collection, the 95%confidence interval was used for the study. Data collection determined the research outcomes through the use of a two-sample t-test and based on a p value of 0.05.

Data Collection and Treatment Procedure

The data collected consisted of a demographic sheet to include: birthdate, gender, ethnicity, and what level of knowledge of chest tubes. Each demographic data sheet was numbered starting with the number one. The 13 volunteer participants took a pre-test that contained 20 questions related to chest tubes (see Appendix C). Participants with the even numbered demographic data sheets received the lecture and demonstration of chest tubes. Participants with the odd numbered demographic data sheets received the lecture/demonstration and performed the simulation scenario with a chest tube. All the participants were rejoined and completed the post-test. The statistical IBM SPSS 21 program was used for data analysis of the Capstone Project. Scores from the pre-test and post-test was coded to attribute a numerical value. Data was analyzed by a two-sample t-test with a probability value (p value) of 0.05 using the SPSS program.

The study measures and statistical methods for data analysis (Table 3) included simple descriptive statistics for the nominal data collected.

Table 3

Study Data

Study Data
Number of participants (n=13)
Characteristics of Participants (Demographic Data)
Pretest scores of all participants

Posttest scores of participants having lecture and demonstration only (n= 6)
Posttest scores of participants having lecture/demonstration/simulation (n=7)

Project Findings and Results

Data was compiled to evaluate the effectiveness of the theory and simulation in terms of enhancing the knowledge level of chest tube management of senior baccalaureate nursing students through a pre-test and a post-test. The sample consisted of a total of 14 nursing students who were assigned to the two intervention groups. One group received theory about chest tubes and the other group received theory and a simulation scenario in managing a patient with a chest tube. The ages of the nursing students ranged from 18-25 with a mean age of 21. There were 12 females and one male. There was one Africa American student and the other students consisted of 12 Caucasian students.

A two-tailed t-test for independent groups was used to test for differences in knowledge levels for the pre-test and post-test. Data analysis revealed the mean pre-simulation knowledge of students in the comparison group was not significantly different from that of students in the group that did not have simulation (57.8), t (12), .454, ($p > 0.05$). However, data analysis within the intervention group revealed significant academic and educational improvements in terms of knowledge measured by post-test exam scores (12.857), t (2.36), 0.598, ($p < 0.05$).

Limitations

There are several limitations to this study. The study included an independent t-test to compare two groups of senior nursing students who volunteered to participate. The relatively small sample size limited the study. One student did not return to complete the post-test following the simulation portion of the project and therefore did not meet the criteria for inclusion in the study. The Capstone Project was conducted on a Saturday while many other

activities were being conducted within the university which may have influenced the size of the sample. The data was collected from only one school site.

Recommendations

Recommendations for future studies include: having more nursing school sites available to collect data and allowing the students to decide the best time to conduct the study for more volunteers to participate in the study. Further research is needed on the use of simulation in nursing education.

An evaluation was completed by the participants following the Capstone Project. All the students commented they were more comfortable in managing chest tubes. They found the simulation scenario to be very informative and it reinforced the information they had previously learned about chest tubes. The participants strongly suggested the capstone project continue for every senior nursing student as a review prior to taking the state board licensure examination.

Implications

Simulation leads the way for the future of nursing knowledge and performance of students to demonstrate knowledge, build self-confidence, develop critical thinking skills, develop psychomotor skills, and prepare for the transition to become a competent nurse. Technology is now and will continue into the future of healthcare. Using simulation technology will grow and enhance the nurses of tomorrow to provide safe and high quality care for the populations into the next generations.

Summary

In conclusion, the results were essentially the same in knowledge levels before instruction regarding care of patients with chest tubes. After simulation there was a significant difference in the simulation group post-test scores that indirectly supports that simulation enhances the knowledge level related to chest tube management for these participants.

This study provided new insight for the university into the role of simulation in the preparation of nursing students to demonstrate their knowledge of chest tube care and management. Simulation offered boundless opportunities to address patient care and safety issues to aid collaboration between education and practice. Simulation provided safe and high quality care for patients. Simulation maybe the hallmark to enhance knowledge levels for safe high quality care for all patients.

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Appendix A

Systematic Review Table

Integrating Simulated Teaching/Learning Strategies in Undergraduate Nursing Education - International Journal of Nursing Education Scholarship	*Limited Use of the Human Patient Simulator by Nurse Faculty: An Intervention Program Designed to Increase Use of Learning Theory/ International Journal of Nursing Education Scholarship*	*Systematic Review of Nursing Simulation Literature for Use of Learning Theory/International Journal of Nursing Education Scholarship*	*High-Fidelity Nursing Simulation: Impact on Student Self-Confidence and Clinical Competence/International Journal of Nursing Education Scholarship*	*Look Before You Leap: Lessons Learned When Introducing Clinical Simulation/ Nurse Educator*	*Taking the Patient to the Classroom: Applying Theoretical Frameworks to Simulation in Nursing Education/International Journal of Nursing Education Scholarship*
Barbara Sinclair, Karen Ferguson, 2009	Cathy King, Beverly Hindenlang, Sarah Moseley, Patrick Kuritz, 2008.	Joanna Kaakinen, Ellyn Arwood, 2009	Cynthia Blum, Susan Borglund, Dax Parcells, 2010	Paula Jaremsky, Jayne McGrath, 2008	Magda Waldner, Joanne Olson, 2007.
PubMed, CINHAL, Simulation, teaching strategies, self-efficacy	PubMed, CINHAL, High-fidelity human patient simulators (HPS), simulation, theory of planned behavior, faculty	Medline, CINHAL, Pre CINHAL, and Healthsource: Nursing simulation, learning theory	PubMed, CINAHL, Pre-CINHAL, Healthsource: High Fidelity patient simulation, caring attributes, self-confidence, clinical competence	Pub Med,, Medline, CINHAL, Pre-CINHAL, Healthsource: Clinical simulation, nursing students	PubMed: Simulation, skill acquisition, clinical education, Benner, Kolb, teaching methods.

The researchers conducted a two-phase study. Phase I investigated research questions about the faculties attitudes, subjective norms, perceived behavioral control, and intent to use HPS. The researchers used data collection from another Phase II educational intervention to answer the following questions of what effect human patient simulation HPS on the intent to use, and what factors are most important in explaining the intent to use human patient simulation (HPS).	Inferential and descriptive statistical methods were used to analyze the data.	Systematic Review of Nursing Simulation Literature for Use of Learning Theory.	The paucity of data supporting high-fidelity patient simulation effectiveness in this population informed the development of a quasi-experimental, quantitative study in relationship between simulation and student self-confidence and clinical competence. The study was designed to detect differences in entry-level student confidence and clinical competence based on laboratory enrollment. However, the results indicated student self-confidence and competence increased regardless of traditional or simulation laboratory enrollment.	A 20-item survey was designed to measure students' confidence, ability, feelings of stress, and critical thinking related to performing various nursing skills, using a 5-point scale. The survey was developed for this study by taking items from the literature and was reviewed by 12 experts in clinical education. The instrument was tested for reliability using Cranach a, which was found to be .91. The method was the development of five scenarios for the study. Students were to perform and think critically about one of the following nursing skills, vital signs, urinary catheterization, intravenous medication administration, nasogastric medication administration, or sterile dressing change. Each scenario listed specific evaluation criteria, questions pertaining to the course objectives, professional socialization, knowledge, decision making, skill performance, and communication.	Application of Benner's and Kolb's Models to Simulation Education in Nursing.
Level I/ I	Level I/ I	Level I/I	Level I/ IV	Level I/ I	Level I/IV

The aim of this study was designed to explore the effect of this type of teaching and learning on student's perceptions of self-efficacy, satisfaction, and effectiveness.	The aim of this study was to explore factors related to nurse educator's use of the human patient simulation (HPS) in nursing education, and to evaluate the effectiveness of an educational intervention.	The purpose of this systematic analysis of nursing simulation literature between 2000-2007 was to determine how learning theory was used to design and assess learning that occurs in simulations. The second purpose of the systematic review of the nursing simulation was to determine how learning theory was used to design simulations.	The foundation caring attributes of professional self-confidence and competence in nursing form the development of clinical judgment and safe nursing practice. Past academic and life experiences provide students self-confidence and competence in everyday situations, however, the complex health care environment present challenges for entry-level nursing students. Therefore, nurse educators must continually to identify, implement, and test teaching-learning strategies to promote efficient development of self-confidence and clinical competence of their students.	The main purpose was to compare beginning-level, baccalaureate nursing students' self-reported assessment in the domains of confidence, ability, stress, and critical thinking before and after they participated in simulation. The aim was to explore the potential benefits of simulation.	The researchers discuss reasons for implementing simulation as a learning approach. The focus of this article is the development of these physical assessment and intervention skills as alternative strategies to help nursing students achieve practice competencies are imperative.
Second year baccalaureate nursing students of two sites in an urban center in southwestern Ontario. Students @ one site served as the intervention group (n=125) and those of the other site formed the control group (n=125). Demographic Data were listed as characteristics of age range from 18-47 (M=21.11), Gender- male 3 (intervention) 6 (control group) 71 females (intervention) 94 females (control group), enrolled full time: 73(intervention) 100 (control group) , previous health care experience : 8 (intervention) 31 (control group).	The voluntary convenience sample of nurse faculty was drawn from a large ADN program in southeastern United States. Phase I consisted of an electronic 47-item survey of faculty related to the use and intentions to use the human patient simulation (HPS) as a teaching tool.	A systematic review of nursing simulation literature was completed to achieve the two purposes. The search strategy covered four literature databases: Medline, CINHAL, Pre-CINHAL, and Healthsource, using the following search words: nursing + simulation nursing	The research study consisted of a southeastern university in USA, utilized of 59 entry-level Bachelor of Science nursing students in their junior year. Initial response was 100%, all students agreed to participate and signed informed consents. Characteristics consisted of age, ethnicity, and gender.	Eighty-five baccalaureate nursing students were surveyed near the end of their first clinical course, during which they were taught nursing skills in a lab setting and worked with patients in acute care and community settings. Of this sample, 48 students comprised an experimental group that participated in the clinical simulation exercise, and the remaining 37 students represented a control group that did not have access to any type of clinical simulation exercise. Most students were white women in their early 20's with junior college level and GPA above 3.0 on a 4.0 scale. They had little to no previous clinical experience.	Authors are looking at all nursing students in general for this study.

Paired t-tests of the mean differences in pre and post self-efficacy questionnaires were completed for both groups. All students completed a demographic questionnaire. A modified Baccalaureate Nursing Student Teaching-Learning Self-Efficacy questionnaire was developed for use pre-and post-lecture or simulated learning activity. The rating used a Likert scale in the satisfaction questionnaire.	The voluntary convenience sample of nurse faculty was drawn from a large ADN program in southeastern United States. Phase I consisted o an electronic 47-item survey of faculty related to the use and intentions to use the HPS as a teaching tool.	A systematic review of nursing simulation literature was completed to achieve the two purposes. The search strategy covered four literature databases: Medline, CINHAL, Pre-CINHAL, and Healthsource, using the following search words: nursing + simulation nursing + learning theory+ simulation, nursing + teaching + simulation. 650 articles were identified. The 650 articles were further screened for two criteria: nursing simulation, and English language. These criteria reduced the initial count to 120 articles. The third sets of criteria were to review the 120 articles about describing teaching and learning. 104 articles did not mention learning theory in simulation, 94 only discussed simulation as a teaching method. A total of 16 articles supported purpose of simulation, evaluation methods, learning theory, findings, and how learning theory supported simulation design.	A quasi-experimental, quantitative study was designed within the content of Associate Degree Nursing (ADN) health assessment and skills course for entry-level nursing students. Students were enrolled in one of three laboratory sections. Each met weekly on a different day for seven hours of instruction and practice. Complete randomization was limited by student schedules and prior commitments. The control group (n=16) demonstrated skill competency using the traditional approach of task trainers and student volunteers, while experimental group sections (n=37 students) demonstrated skill competency using Laerdal's SimMan.	A 20-item survey was designed to measure students' confidence, ability, feelings of stress, and critical thinking related to performing various nursing skills, using a 5-point scale. The survey was developed for this study by taking items from the literature and was reviewed by 12 experts in clinical education. The instrument was tested for reliability using Cronbach alpha, which was found to be .91. The method was the development of five scenarios for the study. Students were to perform and think critically about one of the following nursing skills, vital signs, urinary catheterization, intravenous medication administration, nasogastric medication administration, or sterile dressing change. Each scenario listed specific evaluation criteria, questions pertaining to the course objectives, professional socialization, knowledge, decision making, skill performance, and communication.	Novice and advanced beginner levels of nursing students.	

Five simulations were measured: post-operative, mental health, child with URI, client with Hip replacement, and client with CHF. A p value was obtained for each simulation. Ninety-one percent of students in the intervention group reported the combined lecture/simulation learning activity to be effective or highly effective for their learning. Sixty-eight percent of students in the control group reported lecture only to be effective or highly effective for their learning. Ninety-one percent of students in the intervention tough indicated they were satisfied or very satisfied with the combined lecture/simulated learning activity, compared to the 70% of control group students reported on the lecture only method. The intervention group noted a 91% consistency between the combined lecture/simulation learning activity and their learning style. The consistency for the control group between lecture method and learning style was 76%.	Thirty -four ADN faculty (72%) responded to the electronic survey. Faculty experience ranged from 1-30 years. Age of the faculty ranged from 41-67 years. Twenty eight (82%) were full time faculty, five (15%) were part time and one (3%) participant left this item blank. Thirteen faculty (38%) had previous hand-on training using HPS. Twenty-two subjects (65%) of faculty use the HPS as a teaching tool for students. Twenty-three faculty (68%) used the HPS during the previous academic year. Eighteen faculty (53%) used the HPS once or not at all-in the past academic year. Attitudes: eight survey items measured faculty's beliefs and perceptions related to their HPS use. The overall attitude composite score was 3.9. The researchers identified three groups as being potential influential on faculty in choosing whether to use the HPS included: College of Nursing administrators (CON), faculty members (peers), and students.	Through the systematic review of the nursing simulation literature, it is suggested that simulation is most commonly used as a teaching modality. Therefore, simulation is a planned experience that provides specific goals, methods, and objectives for teaching outcomes. The application of learning theory to guide the design for nursing simulations may increase learning-centered opportunities for students to gain skills, knowledge, and disposition. If learning is the goal of simulation, then the learning processes need to be made explicit to guide parallel simulation activities.	The internal consistency for the four Laseter items used to define student self-confidence, measured with Cronbach's alpha (a) was .810. Student midterm and final self-confidence ratios correlated positively (r=.483, p=.001) and were significantly different (t=5.100, do=52, p=.000). Furthermore, cross tabulations for the overall sample revealed 27 students rated their self-confidence in the "exemplary" range at the final assessment compared to 16 at midterm. Cross-tabulations, Pearson's correlations, Cronbach's alpha, and paired samples t-test were used to examine associations between midterm and final ratings of student and faculty rating of self-confidence and clinical competence for research question.	The analysis revealed a main effect for Time (F 1.85=25.01, p<.001), which was a result of students reporting consistently higher ratings at the post-simulation evaluation than they did at the pre-simulation assessment in all domains for all skills evaluated, except for vital signs, where there was a little change. There was a significant Time X Domain integration (F 4.82=4.30, p<.01) and a significant Time X skill integration F4.82=7.20, p<.001). Independent t-tests were computed examining changes across time in these composite scores. The t tests revealed that there were significant changes across all domains. (all to>3.2, all ps< .01). There was significant increases in all skill areas after the completion of simulation.	In summary, the categories of simulations in nursing education are generally well liked by faculty and students, the evidence of their effectiveness compared to traditional, lectured-based methods and clinical experiences is somewhat inconclusive. Despite the lack of evidence, nursing educators continue to view simulation education as the only available alternative to clinical experience.	

The study both lecture and combined lecture/simulation led to perceived increases in self-efficacy for nursing practice, students reported higher levels of satisfaction with their learning and greater consistency with their learning style. The combination of lecture/simulation was labor intensive and required time and energy to the experience, but according to the students it was well spent. The study may be replicated by nursing programs for creative ways to enhance ways to integrate simulation into their nursing curriculums.	The study results indicated most participants had little, if any; formal HPS training and limited or no experience actually uses the HPS. Therefore, it was not surprising these faculty members lacked a positive attitude regarding their comfort and competence when using the HPS with students. It was interesting to note, that while the majority of faculty had neither formal training nor experience using the (No Suggestions) still believed the HPS was an effective teaching strategy.	The study concludes that most nursing faculty approach simulation from a teaching paradigm rather than a learning paradigm. For simulation to foster student learning there must be a fundamental shift from teaching paradigm to a learning paradigm and a foundational learning theory to design and evaluate simulation should be used.	The results validate the continued use of traditional laboratory methods of teaching using task trainers and return demonstration as an effective approach with entry-level nursing students. While faculty tends to incorporate the use of interactive modalities in the hopes of appealing to the current generation of technologically-inclined students, this decision has not been supported by sufficient evidence for entry-level students. The study contributes to knowledge development in nursing education by detailing an innovative way of measuring student self-confidence and competence. The study provides further quantitative research data extending the discourse on the utility of high-fidelity simulation in nursing education.	The use of clinical simulation in nursing education can gain momentum from the collective experience of nurse educators who are testing this pedagogy across a broad range of fidelity. The findings demonstrated that students do benefit when challenged to improvise social interaction and perform skills in the context of clinical situation, even when using low -fidelity simulation products. Lessons learned from their initial experience with clinical simulation are to expand their teaching strategy within their nursing curriculum.	By combining Benner's nursing skill acquisition theory and Kolb's experiential learning theory, theoretical underpinnings from examine the use of simulations in the context of nursing education are provided. In conclusion, Benner's model of skill acquisition and Kolb's experiential learning model could provide scaffolds for building the progression of simulation experiences most helpful in the development of students' experiences reflect the appropriate sequence of developing nursing knowledge.	

Limitations included a small sample size and low response rate to questionnaires. Additionally students were not randomly assigned to simulation groups, but according to their availability.	Researchers identified three categories of study limitations: sample, instrument, and researcher assumptions. The inclusion of faculty from only one College of Nursing, the small non-randomized sample without a control group, and the predominately homogeneous nature of the convenience sample without a control group, and sample limitations. The researcher's assumption that all participants had a familiarity with the human patient simulation (HPS) since the identified school had this technology for over a decade was also a limitation.	This systematic review of nursing simulation literature between 2000-2007 shows simulation is considered more often as a teaching model rather than a learning model. Most of these studies practice as the acquisition of skills taught through "doing." None of the studies used research about how the brain acquires or learns concepts. More research is needed that investigates the efficacy of simulation for improving conceptual student learning. One conclusion of this study is that most nursing faculty approach simulation from a teaching paradigm that includes goals, objectives, methods, and student outcomes.	The current study was limited by the relative small subgroups and homogeneity of the sample. The study should be replicated with a larger sample of students from different program levels including baccalaureate-and associate-degree settings.	For most of the students, simulation provided stimulation and motivation. Students can practice without the risk of harming any patients. If students chose inappropriate actions they could learn from the description of natural consequences that would follow. They found be developing their own scenarios, they could capture "most teachable moments". Several limitations to the study were not able to resurvey students who did not participate in the study and who did not participate in simulation. The design did not address whether there is a long-term education value of clinical simulation, that is , if it facilitates transfer of skills into the clinical practice setting. They recognized the need to examine learning outcomes at subsequent points in nursing school and after graduation.	Increasingly, simulation experiences are used to assist student to integrate theoretical knowledge into practice.
None	Nothing stated	None	Nothing noted	Nothing	Nothing

The literature supports student's confidence for nursing practice increases through the use of simulation as a method of teaching and learning. Students also report higher levels of satisfaction, effectiveness, and consistency with their learning style when exposed to theory and simulation. This research supports my PICO as evidence by using theory and demonstration along with simulation to further educate the nursing students in the use of chest tube when successfully completed through the use of simulation.	This evidenced-based study offers an approach to increasing the use of simulation by faculty. Simulation is not only a curriculum issue but also a resource concern. Faculty are expected to prepare students to meet the ever-changing challenges and National League of Nursing (NLN) included implementation of advanced technologies to support teaching-learning process. The NLN is the organization that our nursing school has our accreditation through and we must document supporting use of simulation for the students throughout the curriculum.	Simulation is purported as the vehicle for translating classroom knowledge into a safe learning environment. The nurse educator literature supports the use of simulation for helping students feel more confident in performing clinical work. However, self-confident and self-efficacy are only part of the learning process. The use of simulation by nursing faculty will also support the curriculum and enhance the knowledge and learning of each student as the faculty continue to use simulation throughout their courses.	The theoretical framework was Tanner's Clinical Judgment Model to provide a basis for investigating the relationship between human patient simulation (HPS) and the development of self-confidence in addition to critical thinking and clinical competency. The results indicated an overall improvement in self-confidence and competence across the semester, however, simulation did not significantly enhance a caring attitude. The use of simulation may need to further investigate the caring attitude to support the written documentation.	The findings demonstrated that students do benefit when challenged to improvise social interaction and perform skills in the context of clinical situation, even when using simulation products. Lessons learned clinical simulation has prepared a path to expand upon teaching strategy within the nursing program. The supporting evidence through this study will add creditability to my capstone project to increase the nursing students knowledge of chest tube management. The supporting evidence promoted my capstone project to ensure better understanding of chest tube management.	Benner's and Kolb's models provide frameworks that can be used to help nurse educators guide their decisions about simulation experiences for all nursing students. I can further investigate Benner and Kolb in relationship to my PICO and completion of the capstone project through the use of a nursing theorist.

Using Debriefing for Meaningful Learning to Foster Development of Clinical Reasoning in Simulation/ Sigma Theta Tau International	*Assessment of Patient Simulation Use in Selected Baccalaureate Nursing Programs in the United States*/Society for Simulation in Healthcare	*Enhancing Nursing Knowledge Using High-Fidelity Simulation*/Journal of Nursing Education	*Debriefing with the OPT Model of Clinical Reasoning during High-Fidelity Patient Simulation*/International Journal of Nursing Education Scholarship	*Relationship Between High-Fidelity Simulation and Patient Safety in Prelicensure Nursing Education*: A Comprehensive Review/Journal of Nursing Education	*The Development of Evidence-Based Clinical Simulation Scenarios: Guidelines for Nurse Educators*/ Journal of Nursing Education
Kristina Dreifuerst, PhD, RN, ACNS-BC, CNE/2011	Gail Katz, Karen Peifer, Gail Armstrong / 2010	Michael Gates, Mary Beth Parr, Janet Hughen/2012	Ruth Anne Kuiper, Carol Heinrich, April Matthias, Meki Graham, Lorna Bell-Kotwell/2008	Cynthia Ann Blum, Dax Parcells/2012	K.T. Waxman, DNP, MBA, RN, CNL
Pub Med, Medline: Debriefing, Development of clinical reasoning, simulation	PubMed: BSN, nursing education, patient simulation, fidelity	PubMed, Medline: Nursing, simulation, knowledge	PubMed, Medline: patient simulation, debriefing, clinical reasoning, situated cognition	PubMed, Medline, CINHAL: safety, simulation, nursing	PubMed, Medline: nursing, education, simulation, scenarios, evidence-based

Statistical analysis to determine homogeneity of all three sets of data using the Welch and Brown-Forsythe robust tests of equality of mean were significant and supported the ability to combine them into one set of data.	The survey instrument was designed to elicit information about the use of patient simulation (PS) in the nursing schools and to assess how they were using PS in course work. Sixty-schools that responded (78%) reported using PS in their schools.	Nursing students enrolled in med/surgical were randomly assigned based on clinical group to participate in one of the following METI scenarios for their second simulation experience, pulmonary embolism (PE) and gastric intestinal (GI) Bleed. The students had to participate in 2 full days of simulation as part of the requirement for the course. For the purpose of this study, students in the PE group served as the control group for analysis of student examination performances on nursing knowledge for the GI Bleed group, and likewise the students who participated in the GI bleed simulation scenario served as the control group in the analysis examining student examination performance on nursing knowledge.	The project used a structured debriefing, the Outcome Present State-Test (OPT) Model of clinical reasoning following high-fidelity simulation.	Reviewing of the Literature, CINHAL. The integrative review evaluates the current quantitative evidence from pre-intervention-post-intervention and control-experimental research studies related to the use of simulation in prelicensure nursing education directed at enhancing safety in nursing practice.	On the basis of the literature review search and results. The California Institute for Nursing and Healthcare (CINHC) was asked to lead the Bay Area Simulation Collaboration (BASC) to develop clinical scenarios for use in the BASC.The task force agreed on a template that was and able of various best practice models. The scenarios development template designed includes components from a variety of existing templates from the NLN, Laredel Medical, Samuel Merritt School of Nursing, the Oregon Consortium for Nursing Education, and advice from the CINHC consultants, SimHealth, LLC.
Level I/ I	Level II/IV	Level I/I/I	Level I/I	Level I/I	Level I/I
The purpose of this exploratory, quasi-experimental, pre-test, post-test was to test the relationship of Debriefing for Meaningful Learning (DML) on the development of clinical reasoning skills in prelicensure nursing students when compared with customary debriefing strategies and on student's perception of quality of debriefing experience.	The purpose of this exploratory descriptive study was to assess current use of nonuse of PS models in undergraduate nursing schools in the United States.	This study examined the effects of high-fidelity simulation participation on knowledge acquisition.	The purpose of this project is to explore the impact of patient simulation technology on situated cognition of undergraduate nursing students with the long term goal of preparing a workforce of practitioners who effectively manage clinical issues. The desired goals of this project are to determine the clinical reasoning activities surrounding patient simulation and how they compare with authentic clinical experiences. Secondly to determine if the OPT model could be used as a method of debriefing following patient simulation.	The purpose of this review is to objectively synthesize the current evidence linking high-fidelity nursing simulation to measures of patient safety in undergraduate education. This synthesis provides insight into necessary next steps for evidence-based nursing education using simulation to identify the strengths and weaknesses of the selected students.	The purpose of the article is to discuss the Bay Area Simulation Collaborative (BASC) development of guidelines for effective evidence-based scenarios for use in hospitals and nursing schools.

Two hundred thirty-eight nursing students, enrolled in the seventh semester of an eight-semester, traditional baccalaureate degree nursing program at a Midwestern United States university school of nursing. These students were enrolled in an existing pair of clinical and theory courses covering complex adult health issues in the acute care setting. Clinical groups were randomly assigned to the experimental or control groups.	The NLN Bachelors of Nursing Science Schools list was used to identify nursing programs and email addresses of the dean of the school. There were a total of 241 schools of nursing with a baccalaureate programs listed on the NLN website.	The sample consisted of baccalaureate nursing students enrolled in their second-semester med/surgical course. This course represented the students' first opportunity to provide direct care to patients in a med/surgical environment. It was also their first exposure to high-fidelity simulation. All simulation was conducted on campus at the simulation lab. Simulations were run by the clinical faculty under the supervision of the simulation and guidance of the simulation coordinator. All 104 nursing students enrolled agreed to participate in the study. The mean age was 22.34, ranging from 19-37 years of age, majority of females; 13% students were males. The students were part of 12 clinical groups which were randomly assigned by faculty.	The setting of this project was a med-sized city in the southeastern United States. The clinical setting was a non-profit, tertiary care hospital (867 beds) which has a level II trauma designation. Of the 44 undergraduate senior baccalaureate nursing students who participated, the majority were females (89%0, white (98%), with a mean age of 22 years. These students had no previous exposure to patient simulation scenario practice apart from task trainer exercises during their fundamental junior level nursing course.	The number of articles related to nursing simulation, safety, or both in CINHAL exceeds 2500 to date, with large spikes in the 1980s to 1990s and a tremendous increase in 2000, as educators seek to understand the role and find the place for nursing simulation.	Six scholarly articles were reviewed and evaluated to determine whether evidence-based guidelines for scenario development exist.	

Three weeks prior to the HFS experience, participants were instructed to complete the 33-item Health Sciences Reasoning Test (HSRT) and six demographic questions online as a pretest. The 4-hour long simulations involved adult health situations using simulation in the clinical environment. Each simulation experience was allotted 30 minutes for simulation and 30 minutes for debriefing. After completing the Debriefing Assessment for Simulation in Healthcare-Student Version (DASH-SV) and Debriefing for Meaningful Learning Supplemental Questions (DMLSQ)-designed specifically for the study. The students were ask to take a posttest online and could comment for a second opportunity on the DMLSQ items.	The invitation to participate in the survey was sent to all the deans of the schools representing that the dean or their learning laboratory managers complete the survey.	Nursing students enrolled in med/Surg were randomly assigned based on clinical group to participate in one of the following METI scenarios for their second simulation experience, PE and GI Bleed. The students had to participate in 2 full days of simulation as part of the requirement for the course. For the purpose of this study, students in the PE group served as the control group for analysis of student examination performances on nursing knowledge for the GI Bleed group, and likewise the students who participated in the GI bleed simulation scenario served as the control group in the analysis examining student examination performance on PR nursing knowledge.	The method was a descriptive design included a purposive sample of students in an adult health medical/surgical course whose clinical assignment was to complete 5-6 OPT worksheets after authentic clinical experiences. Throughout the semester, the students rotated out of the clinical setting into the simulation lab for 4 hours completing patient simulations and completing the OPT model worksheets.	In reviewing the literature, several themes became evident: overemphasis on student perceptions of simulation effectiveness, interchangeable use of terms such as clinical reasoning, nursing competence, and clinical judgment, each presumed to be related to patient safety, lack of longitudinal work establishing transfer of knowledge from classroom to the clinical practice.	The BASC is a group of 100 member schools and hospitals, totaling more than 600 faculty and hospital educators from both services and academia in the 10 counties in San Francisco Bay Area. The CA Institute for nursing and healthcare (CINHC) in Berkeley, CA leads the BASC. This 2 year project is designed to train and educate nursing faculty and hospital educators in the concept of simulation.	

Statistical analysis to determine homogeneity of all three sets of data using the Welch and Brown-Forsythe robust tests of equality of mean were significant and supported the ability to combine them into one set of data. Statistical analysis for this research question used nonparametric tests because the data set did not demonstrate normality. A Mann-Whitney-Wilcoxon test was used to evaluate the null hypothesis that there would be no difference in mean scores on the DASH-SV when computing the experimental group who received the usual and customary debriefing, method and control group who received the usual and customary debriefing. The Z-values for each of the mean score from the six elements measured by the DASH-SV and the four questions from the DMLSQ were significant with $p<0.05$. The mean aggregate DASH-SV scores were also significant ($Z=-11.99$, $p<0.001$).This demonstrated that the experimental and control groups perceived a difference in the quality of debriefing when the DML method was used, compared to the customary debriefing.	The survey instrument was designed to elicit information about the use of patient simulation (PS) in the nursing schools and to assess how they were using PS in course work. Sixty-schools that responded (78%) reported using PS in their schools. Of those schools who responded, 68% reported planning to purchase additional PS for their BSN programs. Approximately 39 (50%) of them reported using scenario-based PS situations in the educational program. The remaining 39 schools reported only using the PS mannequins for skills and task training. Eighteen schools reported replacing actual clinical hours with PS. However, the amount of hours being replaces arid significantly between schools and was reported in the open-ended comment section.	The findings from the study are encouraging in the fact to develop an evidence base that indicated there are knowledge acquisition benefits to participation in high-fidelity simulations. The results from both the PE and GI Bleed models indicate there is an 8% increase in examination performance for students who participate in high-fidelity simulation compared to those who do not. Further, as all students had equal access to the information tested on the examination, this 8% increase is equivalent to an increase of almost a full letter grade when viewed on a traditional grading scale.	The 44 OPT model scores for the simulation experiences averaged 48 points out of a possible 76 points. These scores were compared with the clinical reasoning scores of the same 44 students during authentic clinical experiences with critically ill med/Surg patients. The 44 OPT model rating scale scores averaged 47 points from a possible 76 points. A comparison of the two groups revealed no significant differences between the mean scores ($t= -1.321$, $p=.194$) . A paired sample t-test comparing the scores for each section of the remodel by student revealed no significant differences between authentic clinical experiences and high-fidelity patient simulation ($t=.680$, $p=.504$). Overall, the scores were higher for simulation OPT worksheets on listing interventions, recording laboratory data, making judgments regarding tests, and connecting present-outcome states and NANDA diagnosis.	A thorough review of the databases yielded 258 scholarly, peer-reviewed articles, of which 18 articles directly addressed the posed research question related to simulation and safety. Replete with student reports of simulation as enjoyable learning activity, the literature does not yet support simulation over other approaches to the teaching-learning of safety competencies in nursing. The findings from the studies are clearly mixed on the effectiveness of nursing simulation in teaching safety competencies to prelicensure students. These study all evidence student growth in knowledge, skills, or attitudes for specific or general nursing safety competencies.	The establishment of a template by the task force for best practice with clinical scenarios.	

Analysis of the data demonstrated a greater challenge in clinical reasoning skills and identification of higher-quality debriefing and a positive correlation between clinical reasoning and perception of quality. Findings demonstrate the DML is an effective debriefing method. It contributes to the body of knowledge supporting the use of debriefing in simulation learning and supports the development of best teaching practice.	The results of this preliminary study describe the use of PS in the responding schools and some of the advantages and challenges faced in undergraduate nursing. Advancing the science of nursing education through technology into teaching and learning is essential to prepare nurses for the changing healthcare environment. The goal of providing quality education that promotes critical thinking skills through active learning can be met, in part, through the use of PS in nursing educational programs.	The results of the study indicate that for beginning nursing med/Surg undergraduate students, participation in high-fidelity simulation is positively related to knowledge acquisition, as evidenced by higher scores on content-specific examinations. These findings link simulation participation to knowledge acquisition help build the necessary evidence base required to support the use of high-fidelity simulation as a viable substitute for traditional clinical experience and justify the large capital expenditures associated with its implementation and use.	The results of this project indicate that faculty should be challenges to create and manage patient simulation scenarios that coordinate with didactic content and clinical experiences, in order to direct student learning for the best reinforcement of clinical reasoning outcomes. Simulation activities are aligned with constructivist learning theory and situated cognition that are experientially determined according to the individual learning style. Simulation allows for errors in decisions and judgments without harming the patients. However, long term benefits of developing clinical expertise remain to be discovered.	Therefore, nurse educators must continue to select the most appropriate methods based on the specific course, student, or program type, with concentrated focus on competency-based safety education in nursing.	The technology of high-fidelity simulation presents realistic and interactive patient scenarios that provide excellent platform to educate and improve health care providers' skills, knowledge, and critical thinking abilities. Clinical scenarios that are based on clear learning objectives and sound research evidence are important to the success of simulation. It is imperative to establish guidelines; the BASC has taken components of various experts' suggestions and developed an amalgam template for use. It is essential that these written scenarios be validated by peers, tested by students, and contain evidence-based literature to support them.	

Several limitations were identified. Challenging to find a quantitative, objective instrument that measured clinical reasoning in nursing students. Another one being selection bias. The ability to generalize the process and outcomes of this study may not be possible in other schools of nursing or with other nursing students. There is a need to repeat this study using multisite, repeated measures design to address these limitations.	There are limitations related to selection of the sample population. Not all Baccalaureate nursing programs are National League of Nursing (NLN) accredited. These exclusion criteria limited the number of respondents and possibly created bias in the study. Another limitation is the sample size and the response size. Other limitations are the lack of an established and standardized survey instrument. The lack of clarity in some of the survey's language is another limitation. Complexity of scenarios and the level of realism were not consistently understood among schools. Currently, there are no established standards for assessing use of Patient Simulation in nursing schools.	Several limitations to this study were noted: 12 different clinical faculty leading their clinical groups through simulation, as well as the debriefing sessions, there were concerns of the varying of clinical expertise and knowledge. In addition to statistical controlling for these potential differences, provide the faculty with more training and more closely monitor the content discussed in the debriefing sessions has the potential to decrease bias in the results. The sample size was adequate to support the evidence; it could also be viewed as a limitation. A larger sample size would allow for the inclusion of additional variables, most notably whether students had the opportunity in their clinical rotations to care for a patient with a PE or a GI Bleed. The current results should be limited to med/Surg nursing students also.	The project was limited to a small sample size and a descriptive design, the findings showed comparable results between the two measurements. Another consideration for future research is to determine if the absence of OPT worksheet score variability between students was related at the similarity of clinical experience of if group collaboration impacted choices made during simulation.	Several studies failed to equalize the amount of time students spend in their respective treatment condition, the hours in simulation and the hours in the classroom. The lack of evidence to support a change in nursing education.	The BABC plans to develop an evaluation tool for its members' use.
Disclosed no financial or otherwise.	None	The authors had no financial or proprietary interest in the materials.	Nothing noted	Nothing noted	Funded through a grant from the Gordon and Betty Moore Foundation
Due to the findings as noted by the author, it is imperative to conduct debriefings following the use of simulation for the supporting evidence of best teaching practice.	This is one of the first study to describe the patterns of using patient simulation (PS) in nursing schools for clinical education. As the use of this technology grows in the BS programs, addressing the issues resulting from this study are essential for understanding the use of technology in nursing education.	This study supports my capstone question in the use of technology for teaching the management of chest tubes and to increase the knowledge of the students through examination to increase their overall grade point for the course. The sample population that I am using is the med/Surg nursing students.	This study supported the use of simulation in relationship to clinical practice. With the practice of managing chest tubes and practicing the care of chest tubes, the students are less to make mistakes and prevent any harm to come to the patients.	From this study, perhaps there is a way I can institute safety into my Doctor of Nursing Practice (DNP) capstone project to reinforce the importance and the need to stress safety for anything that is performed to the patients. Safety must be the top priority for all patients as a clinical faculty, it is imperative to promote and project safety at all times during the clinical setting and the simulation setting.	When looking at the scenario the author will be presenting to the students for the PICO ,the author will be looking at the research that was supplied in this article. The main concerns for evidence-based clinical scenarios consists of: learning objectives, assessment plan and instruments, evidence base for objectives and assessment, pre-scenarios learner activities, general debriefing plan, validation, testing, facilitation, and debriefing.

The role of simulation in nurse education/Nurse Education Today	*The Impact of a Simulation Lab Experience for Nursing Students/Nursing Education Perspectives*	*Simulation in an Undergraduate Nursing Curriculum: Implementation and Impact Evaluation/Journal of Nursing Education*	*Successful Techniques for Using Human Patient Simulation in Nursing Education/Journal of Nursing Scholarship*	*Theory-Based Research of High-Fidelity Simulation Use in Nursing Education: A Review of the Literature*/International Journal of Nursing Education Scholarship	*Human Patient Simulation Evaluation Rubrics for Nursing Education: Measuring The Essentials of Baccalaureate Education for Professional Nursing Practice*/Journal of Nursing Education
Caroline McCaughey, Marian Traynor/March 2012	Deborah Lewis and Ann Ciak/August/2012	Maura Schlairet	Evelyn Brewer,/2011	Liam Rourke, Megan Schmidt, Neera Garga/ 2010	Alison Davis, Laura Kimble/ 2011
PubMed, CINHAL: simulation, fitness to practice, undergraduate nursing students, manikin	PubMed, Medline: Diploma nursing education, critical thinking, student satisfaction, self-confidence, cognitive learning	PubMed, CINHAL: simulation, undergraduate nursing, curriculum, implementation, evaluation	CINHAL, PubMed: human patient simulation, nursing education, mannequin	PubMed, CINHAL: high-fidelity simulation, nursing education, nursing research	CINHAL: human patient simulation, nursing education, baccalaureate education, professional nursing practice
A descriptive survey essentially a longitudinal study in which a primarily quantitative approach was adopted, congruent with accessing a larger sample. The study was conducted over six months.	This study used a quasi-experimental design to investigate the effectiveness of a simulation lab experience for learning. A convenience sample consisted of students in the Growing Family Nursing course which focused on the nursing care of children and maternal newborn populations, both from a normal developmental wellness perspective and care during illness.	A systematic review of the evaluation literature on simulation-based medical education. A comprehensive program evaluation of a Simulation Demonstration Project was undertaken to explore the influence of simulation across an undergraduate curriculum in a college of nursing.	An integrated review of current literature was completed using the CINHAL with full text and PubMed databases to identify studies that used simulation successfully in nursing curriculum.	Reviewed the primary literature archived in the CINHAL and Proquest Dissertation and Theses for empirical reports using key terms of high-fidelity simulation, and nursing from the years 1989-2009.	This article identifies and assesses six rubrics purported to measure outcomes of human patient simulation and evaluates how there rubrics measure outcomes reflecting the baccalaureate essentials. Psychometric data were limited for the majority of the data.
Level I/III	Level I/I	Level I/I	Level I/I	Level I/I	Level I/I
The purpose of the study was to evaluate the role of medium to high fidelity simulation in preparation for clinical practice, and to evaluate how it helped students make the transition to a staff nurse.	The purpose of this study was to investigate the impact simulation laboratory experiences have on critical thinking, student satisfaction, self-confidence, and cognitive learning.	The focus of the evaluation was on program activities accomplished (implementation evaluation) and the extent to which program objectives and outcomes are met (impact evaluation).	The purpose of this paper was to explore techniques used successfully for human simulation exercises in nursing education.	The purpose of this study is to investigate their claim that theory-based research plays an inadequate role in the study of Human patient simulation (HPS) use in nursing education.	The purpose of this article is to review and discuss existing rubrics used to measure outcomes of Human patient simulation and to evaluate how these rubrics measure outcomes reflecting the baccalaureate Essentials.

An entire cohort of adult branch (n=153) nursing students from a Higher Education Institute (HEI) was invited to participate This sample was chosen as they were a group who had recently been exposed to simulated learning and were approaching transition from nursing student to staff nursing during this time frame.	Sixty three students participating over four semesters in a diploma nursing program, part of an advanced teaching community hospital and major regional health system, initiated a simulation clinical learning experience at a multidisciplinary training and research facility for simulation-based education.	Study participates were junior-level and senior-level BSN students enrolled in a college of nursing at a regional university in the southeastern United States. The 161 students were all enrolled in BSN nursing coursework and represented both the traditional and the accelerated program tracks. The accelerated track for non-nursing graduates offered the BSN for individuals with undergraduate degrees in other disciplines to transition into nursing in 15 consecutive months of study, excluding prerequisites. All students in the study were exposed to simulated clinical experiences throughout the BSN curriculum-amount, frequency, complexity of exposure varied at the course level. Twenty-six full time faculty were also targeted for data collection. Using convenience sampling, qualitative and quantitative date were collected to address information gaps, including data reflecting student's perceptions of simulation and faculty perceptions of the use, integration, and simulation-related outcomes. The full time faculty made up of 26 members, the majority of females (85%) and doctorally prepared (50%).	A review of literature was completed by using CINHAL. Thirty seven studies were reviewed. Inclusion criteria included research articles published in English within the past 5 years that examined the use of simulation in post-secondary nursing education. The time period of 4 years was chosen due to the 2005 NLN core competency recommendation to use more advanced teaching technology. Studies were only included if the resulting data were analyzed and reported, providing supporting evidence.	Reviewed the primary literature archived in the CINHAL and Proquest Dissertation and Theses for empirical reports using key terms of high-fidelity simulation, and nursing from the years 1989-2009.	This article identifies and assesses six rubrics purported to measure outcomes of human patient simulation and evaluates how there rubrics measure outcomes reflecting the baccalaureate essentials. Psychometric data were limited for the majority of the data.	

The thirty-two questionnaire, incorporating twenty-seven Likert scales and five demographic was devised. A five-point scale consisted of strongly agree to strongly disagree. The questionnaire was administered on the final day of the nursing students' programmed. The data analysis was coded to attribute to a numerical value and inputted to SPSS for Windows version 150. Descriptive statistics were employed to illustrate frequencies, and estimate central tendencies: these included the mean, mode, and median. Percentage distributions were calculated as they are to compare the data with findings from a different sample size.	The convenience sample consisted of prelicensure students in the Growing Family Nursing course during a period of four semesters. A comparable group of students, who took the course during the summer semester and did not have simulation experience, served as a control group for standardized testing. A small number of students in the nursing program are practical vocational nurses who are working toward their requirements for a registered nurse. The student population consists primarily of Caucasian women with an average age of 28. Most clinical experience in this senior-level nursing course take place in a specialty tertiary care hospitals and in the community.	The broad evaluation method used a mixed methods approach and allowed for use of student and faculty data derived from surveys, program evaluation data, faculty reports of simulation related scholarly work, and use of externally validated data collection instruments.	A review of literature was completed by using CINHAL. Thirty seven studies were reviewed. Inclusion criteria included research articles published in English within the past 5 years that examined the use of simulation in post-secondary nursing education. The time period of 4 years was chosen due to the 2005 NLN core competency recommendation to use more advanced teaching technology. Studies were only included if the resulting data were analyzed and reported, providing supporting evidence.	The authors reviewed the primary literature archived in the CINHAL and Proquest Dissertation and Theses for empirical reports using the key terms of high-fidelity simulation and nursing from the year 1989-2009. Of the articles that matched the inclusion criteria: 45% made no use of theory; 45% made minimal use; and 10% made adequate use for a total of 87 articles. They argued that theory-based research could bring coherence and external validity to this domain. They classified the article into three categories of theory-used-adequate use of theory, minimal use of theory, no use of theory.	Supporting the curricular framework proposed by the American Academy of College Nurses (AACN), when faculty integrates human patient simulation, positive nursing student learning outcomes must be documented. Each Essential has specific content that guild on one another to provide the optimal learning environment for baccalaureate-prepared nurses. By developing of the Clinical Simulation Grading Rubric, is provides a rubric that can measure several of the Essentials. There was a table provided in the study of the different identified rubrics and the essentials that were evaluated with human patient simulation.	

A total of 93 questionnaires were completed and returned constituting a 60% response rate. All had been to simulation for a one four hour period waiting the past eight months. This study affirms the conductive influence which participation in simulated learning has on a final year nursing student's clinical effectiveness. Furthermore over three quarters of nursing students (77.4%) approved simulation as enhancing their ability to provide holistic care, this indicating that learning gains extend beyond that of the physical and technical domain of patient care.	A significant gain in knowledge was found between the pretest and posttest for all 63 students, the mean pretest scores were 0.664 with a 95% confidence interval. Sixty-two students completed the post test; the mean test score was 0.823 with a 95% confidence interval. For each semester, a statistically significant increase in knowledge was found using a paired student t-test ($p < 0.005$).Positive results were confirmed for satisfaction and self-confidence using the NLN tool. On the five-point Likert scale, the overall mean for satisfaction with learning experience was 4.33, while the overall mean for self-confidence in learning was 4.35. Based on the finding from this study, no definitive conclusion was made regarding critical thinking and experience in high-fidelity human simulation training.	Student characteristics represent one of the five elements of the Nursing Education Simulation Framework (NESF). Of the 161 surveys packets, 150 were returned, for a 94% response rate. Seventy-eight percent of students could be described as Millennial learners, those between ages 18-24 year. Mean age was 24 years (SD=5.3), with a range of 19 to 47 years. Implementation evaluation of education: education practice noted a Cronbach's alpha of 0.944. The implementation evaluation: simulation design scale noted a Cronbach's alpha of 0.962, Impact Evaluation: Satisfaction and Self-confidence notes a Cronbach's alpha of 0.933, differences by student characteristics: program a chi-square analysis revealed scores for students enrolled in the accelerated track (n=23) were significantly different on the measures reflecting active learning of simulation.	Instructors should develop clear evaluation criteria to evaluate student performance, and students need to have a clear understanding of what is expected of them. Likert-type scales were the common method of obtaining student performances. There was not a single accepted means of student evaluation for further research. Techniques for simulation exercises observed in the reviewed studies included student participation, team interaction, cooperative learning, and documentation of the session. Students in the studies frequently worked in teams, mimicking the way care is delivered in real life. This teamwork allows for the students to role=play in different positions of the healthcare team, to delegate, to share information, and to develop communication skills. It provided an opportunity for student participants to discover and identify areas of knowledge deficits. The largest post simulation activity was debriefing.	The purpose of this review was to gauge the extent to which theory-based research is continuance or the understanding of high-fidelity simulation (HFS) use in nursing education. The findings indicated its contribution is negligible. Only ten percent of the studies mad adequate use of theory of learning, instruction, or technology to find the formulation of research questions, the collection of data, interpretation of results, and, importantly, prescriptions for practice and subsequent research.	Essential V and VII were not measured by any rubric. Essential V entails the aspects of the healthcare policy, finance, and regulatory environments. This aspect of nursing has the potential to be vital to the success of the future of nursing as health care continues to experience change in the provision of patient care. This should be considered and developed into the evaluation.	

This study offers very encouraging evidence to support the use of simulation within year three of the undergraduate nursing curriculum. Simulation is perceived by the nursing students as an effective learning mechanism, it is also reported as enjoyable to the extent that the respondents to have simulation increased and earlier in the curriculum. One striking finding is the prospective benefit of increased competence and safe practice of practitioners following the use of simulation. There is indication of their skills acquired during simulation exercise will be transferred into the clinical setting to the advantage of patient care. This study provided new insight into the role of simulation to aid preparation to the nursing students for their management assessment and transition to qualified nurse. It provides a risk-free environment that is not obtainable in the clinical environment.	The results had positive insight on how students respond both cognitively and effectively, to a simulation experience. It was concluded that simulation provides an effective means of improving knowledge in a safe clinical environment free of patient harm. As a result, a simulation lab experience is now part of the Growing Family Nursing course and being added to other courses. Future research is needed to explore ways to assess critical thinking and how it relates to simulation.	The results of this study supported the continued integration of simulation throughout the undergraduate nursing curriculum. The NESF was helpful in guiding the evaluation of simulation and promoting the ability to interpret results at the curriculum level from implementation and impact perspectives. The NESF allowed to clearly describe the use of simulation across the curriculum to drive systematic thinking about long-lasting learning goals and curriculum-wide simulation planning.	Simulation training is becoming commonplace in nursing education. However, human patient simulation (HPS) use has not yet developed to its fullest potential. While viewed positively by students and faculty, there is scarce quantitative research to validate its value. There is a shortage of proven tools to use for validation. Most of the research is qualitative, and although this is valuable, to justify the cost of equipment, faculty time involvement, and student investment, more research is needed to document the true worth of this promising educational method.	The study should not be read as a criticism of inductive or wholly descriptive research-much of the authors work went into this research. The author's recommendation is that this research is tipped to heavily toward the descriptive: even the literature reviews in this domain yield little beyond lists of findings.	Human patient simulation is ever-increasingly used in nursing education to meet the challenges in today's nursing programs. As human patient simulation continues to grow, so is the need to have reliable and valid evaluation rubrics to reinforce the value of the technology advanced teaching tool. There are several rubrics located for student learning outcome evaluations; however, the majority of the rubrics are in pilot form. Until Human patient simulation is rigorously evaluated, simulation integration into nursing curriculum will continue to be an anecdotal acceptance rather than evidence-based integration into nursing education.

A number of limitations to include: a single institution utilizing the convenience sample, but did include a large sample size, increasing the likelihood of a representative sample from the adult branch nursing student population. It was also a quantifiable outcomes and therefore these subjective opinions may not be interpreted as scientific proof. The questionnaire would benefit from testing of the psychometric properties of the instrument to establish constructive validity. Several unfinished questionnaires were returned which may threaten the validity of the instrument.	Better information might have been obtained about critical thinking scores for each student if they were assessed before and after simulation. A one-time event, such as a laboratory experience, may not be enough to significantly impact critical thinking. A sample size of 53 may not be large enough to draw broad conclusions, especially in areas of critical thinking.	Participant recruitment was by convenience, and group size in sub-analysis was small in some cases. Conceptual learning was not measured in this work. Faculty-level instruments were developed by the investigator for program evaluation purposes and were not externally validated. Additional research needs to be done to extend the generalizability of these findings.	Limitations include difficulty in quantifying descriptive data and potential for student response bias during focus group discussions.	Potential advantages of theory-based research, including the ability to synthesize observations from multiple studies and to contribute to a non-trivial collection of results, do not materialize. A second difficulty with the studies is that they are not investigating the types of learning processes and outcomes that Kolb was attempting to account for. Such superficial uses of theory compressed the most frequent categorization in Silva's study which she cited because they could not make no contribution to the testing and refinement of the theory. Two recurrent complaints about high-fidelity simulation research is the results are piecemeal and the lack of external validity are related to the inadequate use of theory demonstrated by these studies.	Essential V and VII were not measured by any rubric. Essential V entails the aspects of the healthcare policy, finance, and regulatory environments. This aspect of nursing has the potential to be vital to the success of the future of nursing as health care continues to experience change in the provision of patient care. This should be considered and developed into the evaluation.
None	None	None	None	None	None
This article support the use of simulation in nursing education is an essential component for the students to practice in a risk free environment and it strengthened the use of high-fidelity simulators to contribute to support the knowledge the nursing students obtained and also enhanced the safety of their practice for their patients. I will be using High-fidelity SIM Man for the chest tube scenario.	Supporting evidence to use simulation to improve knowledge and self-confidence in nursing students by performing in the simulation lab.	Simulation in an Undergraduate nursing curriculum revealed positive outcomes as evidenced by the comments made by the nursing students. It gave them a chance to use the knowledge they already had and gained the knowledge about things they did not know about. They were grateful they actually went through the actual experience and not just talked about it. Their confidence was high, increased decision making, critical thinking, and sense of accomplishment. Using simulation for my capstone will also add support to this research finding.	Supporting documentation of preparing the nursing students prior to the simulation exercise, care out the exercise via teamwork, allow for mistakes, and to conduct a proper debriefing to gain the full meaning of simulation for the best outcomes for the patients.	This study did not support evidence that there is any theories of learning, instruction, and technology that are used to construct High-fidelity simulation. Are we doing the students a disservice by not providing them any supporting theories upon the use of high-fidelity of simulation? This is a question to be further investigated???	Nurses with a knowledge base inclusive of the organization of healthcare services, reimbursement, and regulatory agencies will be instrumental for the future of nursing. As nurses understand the complexity and a part of the environment in which they practice, the caring values of the profession will be inclusive in the healthcare for all populations of people.

Simulation -based learning in nursing education; Systematic Review/Journal of Advanced Nursing	*Simulation Techniques to Bridge the Gap Between Novice and Competent Healthcare Professionals/The Online Journal of Issues in Nursing, A Scholarly Journal of the American Nurses Association*	*Getting Ready for Simulation -Based Training: A Checklist for Nurse Educators: Nursing Education Perspectives.*	Advancing the Science of Human Patient Simulation in Nursing Education/nursing. The clinics.com	Integrating simulation training into the nursing curriculum/British Journal of Nursing	Nursing Students' Self-Assessment of Their Simulation Experiences/Nursing Education Perspectives
Robyn Cant, Simon Cooper/ 2010	Susan Galloway	Mary Guimond, Mary Lou Sole, Eduardo Salas/2012	Paula Jarzemsky, 2012	Amanda Wilford, Thomas Doyle/2006	Mary Cato, Kathie Lasater, and Alycia Peeples/2009
PubMed, CINHAL, CINAHAL PLUS, ERIC, SCOPUS, Embase, Medline,Proquest, Proquest Dissertation, Theses Databases: Learning literature review, nursing education, simulation, systematic review	PubMed, CINHAL: competency, continuing education, human patient simulator, health professions education, interdisciplinary education, simulation	PubMed, CINHAL: simulation-based training-checklist, training, instructional design, patient simulators	PubMed, CINHAL: nursing, education, human patient simulation, evaluation	PubMed, CINHAL: simulation, pre-registration curriculum	PubMed, CINHAL: self-assessment, simulation, clinical judgment, rubric clinical learning
Reviews of literature for 1999-2009.Twelve studies were included in this review. These used experimental of quasi-experimental design.	An article review of literature reviews in relationship to simulation use in nursing education.	Overview of relevant seminal literature reviews.	A literature review of strengths of each approach, challenges of each approach, challenges yet to be addressed, and implications.	A piloted program was the foundation of the findings for this article	A clinical judgment rubric, based on the Tanner Model of Clinical Judgment, is used as a self-assessment tool. The rubric describes the development of clinical judgment over four levels and is scored by students as they reflect on their practice.
Level I/I	Level III/VIII	Level II/IV	Level II/VII	Level II/IV	Level I/III
The aim is a report of a review of the quantitative evidence of medium to high fidelity use of manikins in nursing in comparison to other education strategies.	The aim of this article is to describe simulation techniques currently being sued in healthcare education and identify future directions for the use of simulation in healthcare.	The article highlights some of the seminal literature from the science of training and discusses principles most applicable to nursing education.	This article explore catalysts for nursing education reform, with particular attention to how they have informed an ongoing debate about combining the use of human patient simulation (HPS) with traditional clinical learning experiences in nursing education. It considers strengths and limitations of each approach and explains why an increased commitment to the scholarship of teaching and learning is vital to advancing the science of simulation.	This article give a brief history of simulation, discusses competence issues and why simulation is best placed to teach nurses in today's health service. An innovative approach to implementing simulation into the nursing curriculum is introduced.	This article describes how simulation faculty introduced and helped students use the Lasater Clinical Judgment Rubric, a theoretical and empirically grounded assessment tool for simulation, as a personal, reflective, self-assessment tool.

CINHAL, PLUS, ERIC, SCOPUS, Embase, Medline,Proquest, Proquest Dissertation, Theses Database	The author will describe various types of simulators and simulated experiences, including role playing, standardized patients, partial task trainers, complex task trainees, integrated simulators, and full mission simulations. Populations of undergraduate nursing programs, continuing education programs, interdisciplinary teams.	Prelicensure education, the principles of analysis is the same for scenario based training and hospital-based programs in nursing education.	nursing, education, human patient simulation, evaluation	A piloted program was the foundation of the findings for this article. Is consisted of 13 universities over a three-month period the reported findings in early January 2007.	Junior nursing students in a clinical adult acute care course participated in manikin-based simulation as and integrated clinical learning activity since 2004.
The quality of the included studies was appraised by the Critical Appraisal Skill Program criteria. Twelve studies were included I this research article.	Informational paper	The existing research supports the inclusion of training techniques that emphasize meta-cognition to potentially increase the transfer of knowledge gained during simulation training to the clinical environment and improve critical thinking skills. In addition, it points to the need to conduct a pre-training assessment of the learner to evaluate self-efficacy and prior level of knowledge, experience, and expertise.	The 2010 report: The Future of Nursing: Leading, Changing, Advancing Health and also demonstrated strong ties to QSEN competences.	A piloted program was the foundation of the findings for this article. Is consisted of 13 universities over a three-month period the reported findings in early January 2007.	A clinical judgment rubric, based on the Tanner Model of Clinical Judgment, is used as a self-assessment tool. The rubric describes the development of clinical judgment over four levels and is scored by students as they reflect on their practice.
Twelve studies were included in this review. These used experimental of quasi-experimental design. All reported simulation as a valid teaching/learning strategy. Six of the studies showed additional gains in knowledge, critical thinking skills, over satisfaction and self-confidence compared to a control group (range 7-11%).	None	The outcomes found important to develop a useful task analysis, promoting teamwork through analysis, consider alternative instructional strategies which were designed to formulate a checklist. It was derived from the science of training literature and is applicable to any health care simulation. The checklist provides important activities for the pre-training analysis that is often overlooked: individual, organizational team, and task analysis.	The arrival of simulation revitalized curiosity about best practices in nursing education. Simulation has provided a common platform for other health disciplines to share ideas. Widespread acceptance of simulation in nursing education cannot progress without more effective research. Nursing faculty need to determine core competencies and clinical situations that are most appropriate to included demonstration of reducing errors.	Simulation has been gaining momentum in education for the last 40 years. For simulation to be successful, learner needs to suspend reality and interact with the simulator as though it was a real patient. When learning occurs in a realistic environment related to work, learning is retained and reproduced. Within the Programmed for Nursing Curriculum Integration, there are 90 simulated clinical experiences to choose from which cover all age ranges and locations.	The majority of students show an ability to think deeply about the simulations they encountered, analyze the patient events and their responses, and apply their experiences in their broader knowledge of nursing and the clinical judgment required to practice safely and effectively. The tool has proved to be a useful method for clinical and simulation faculty to review as they plan learning activities for students; requiring specific examples offers additional insight into the students thinking.

Medium and high fidelity simulation is effective learning and teaching methods when best practice guidelines are adhered to. Simulation has advantages over teaching when used in the proper context.	The author concludes by noting that next steps in using simulation to strengthen the provision of healthcare include providing healthcare educators with the motivation and competencies needed to create and use meaningful simulation learning experiences and initiating more research regarding the benefits of simulation in healthcare education.	Scenario based training and patient simulation are important tools for nurse educators. Their use many improved if scenarios are carefully selected and implemented; otherwise, one of two things can happen. First, learners may practice knowledge, skills and attitudes (KSA) that are available in the clinical environment, resulting in an ineffective or inefficient use of the technology. Second, it is possible that practice will be for the sake of practice rather than for any significant learning that could contribute to improved teamwork and communication. Finally, scenario based training is a critical element for team training; it is essential that team training is well planned to meet the needs of an ever-changing and always precarious health care system.	Collaboration to ensure that studies are replicated using reliable, valid instruments and appropriate outcome measures is necessary to build a convincing body of nursing research that supports the use of simulation in nursing education.	The Programmed for Nursing Curriculum Integration has been designed to assist in the integration of human patient simulation. It allows facilities of health and social care to easily and effectively develop an evidence-based simulation curriculum to prepare nurses for caring in the 21st century and beyond.	The Lasater Clinical Judgment Rubric offers students the language needed to describe their progress. The four phases of Tanner's Clinical Judgment Model provide a framework for students to organize their thoughts about managing various patient simulations. Very specific examples from the scenarios indicated that students had encountered valid learning experiences in simulation.
Further studies and investigation to determine the effect of team size of learning and to develop a universal methods of outcomes measurements.	None	The lack of pre-training analysis performed prior to use of simulation.	More studies of this type must be encouraged in graduate schools of nursing. As stated in "Future of Nursing", successful inter-professional education can be achieved only through committed partnerships across professions. Collaboration within nursing education and across other health care disciplines is needed to maintain this rich exchange of ideas.	Nothing was provided in the reading	Simulation faculty found two times per term to be impractical for thorough, individualized review and comments on each student's self-assessment. To make the process more manageable and to continue to provide high quality of personalized feedback, students now do self-assessments once per term in selected outcomes.
None	None	None	None	None	None

Supporting documentation from the systematic literature review that simulation is an effective teaching and learning tool for nursing students. It provides documented research in support of simulation use for nursing students which I will be pursuing for my capstone project.	Informational paper to provide the reader the types of simulation/simulators, task trainers, integrated simulators, debriefings, use of simulation in nursing education and practice, undergraduate programs, continuing education and in-service education, interdisciplinary team training, competency assessment, resources and costs related to the use of simulation.	A checklist to provide to the students to ensure they preparation for simulation training. I will include a pre-course checklist to properly allow the students to prepare themselves for the classroom and the simulation lab.	The greatest emphasis is nursing today is SAFETY. As an educator and health care provider, it is imperative to teach and demonstrate the importance of safety in every facet of nursing. Simulation will provide the tool to instill in practice the techniques to ensure safety as related to my PICO and the management of Chest tubes.	The supporting documentation as an innovative approach to implementing simulation into the nursing curriculum to better the education or all nursing students and to teach nursing student's in today's ever-changing health care environment,	Lasater's tool is an effective approach in evaluating the simulation used by the nursing students. Perhaps a tool that I can use for my simulation project and to give guidance in formatting an appropriate self-assessment of the students.
Development of High-Fidelity Simulated Clinical Experiences for Baccalaureate Nursing Students/Journal of Professional Nursing	*Quality indicators for the design and implementation of simulation experience: A Delphi study/Nurse Education Today*	*The Integration of Simulation into a Clinical Foundations of Nursing Course: Student and Faculty Perspectives/International Journal of Nursing Education Scholarship*	*The Effect of High-fidelity Patient Simulation on the Critical Thinking and Clinical Decision-Making Skills of New Graduate Nurses/ The Journal of Continuing Education in Nursing*	*Comparing self-guided learning and educator-guided learning formats for simulation-based clinical training/Journal of Advanced Nursing*	
Sandra Founds, Grechen Zewe, Leslie Sheuer-2011	Carol Arthur, Tracy Levett-Jones, Ashley Kable/July 2012	Susan Kardong-Edgren, Angela Starkweather, Linda Ward/ 2008	Rhonda Maneval, Kimberly Fowler, John Kays, Tiffany Boyd, Jennifer Shuey, Sarah Harne-Britner, Cynthia Mastrine	Ryan Brydges, Heather Carnahan, Don Rose, Adam Dubrowski/2010	
PubMed: High-Fidelity simulated clinical experiences; teaching tool; nurse educators; simulated clinical experiences; High-risk antepartum obstetric scenarios	PubMed, Medline: simulation, quality indicators, nursing, Delphi	PubMed: simulation, undergraduate nursing education, simulation scenarios	PubMed, Medline: high-fidelity, critical thinking, clinical decision making skills, new graduate nurses	CINHAL, Medline: clinical training, educator-guided learning, nurse education, proficiency-based training, self-assessment, self-directed learning, simulation	

Educators formed a task force to coordinate progression in the level of critical thinking and behaviors for scenarios from freshman through senior years in the baccalaureate curriculum.	A modified Delphi technique was selected . The Delphi method involved the systematic solicitation and collection of expert opinions on a particular topic through sequential questionnaires interspersed with feedback derived from earlier response.	A prospective, descriptive, repeated measures design was used among 100 undergraduate nursing students to evaluate three scenarios written by faculty. Educational practices, simulation design, and student satisfaction and self-confidence were evaluated using tools obtained from the National League for Nursing. Faculty and student comments about using the medium fidelity simulation with VitalSim mannequin as a teaching methodology in the first semester undergraduate nursing curriculum. A convenience sample of undergraduate nursing student body was used, as faculty wanted to provide equal learning opportunities to all students, instead of a control/experimental groups.	A pre-test-posttest design was used to assess critical thinking and clinical decision-making skills in two groups of graduate nurses who were exposed to two different new nurse orientations. One included high-fidelity patient simulation and one did not.	Randomized control, four-arm experimental design. Nursing students were equally distributed to the four intervention groups: proficiency-based, progressive, yoked control and open-ended. Randomization was stratified by participants sex. Only six participants were male; they were assigned equally to the proficiency-based (n=1), progressive (n=2), yoked control (n=2) and open-ended groups (n=1).	
Level II/ IV	Level I/I	Level I/I	Level I/I	Level I/I	
The purpose of this article is to share the system used in developing simulations with high-fidelity, computerized manikins.	The aim of the research was to develop a set of quality indicator statements that would be applicable internationally and could be used to guide the development, implementation and evaluation of simulation experiences in undergraduate nursing curricula.	This paper will describe an approach taken by one undergraduate nursing program in the United States that focused on integrating simulation into a clinical foundations nursing course.	The study was conducted to determine whether the addition of high-fidelity patient simulation to new nurse orientation enhanced critical thinking and clinical decision-making.	The aim of the study was to test the over-arching hypothesis that progressive self-guided learning (SGL) offers equivalent learning benefit versus proficiency-based training while limiting the need to set proficiency standards.	

The baccalaureate nursing program at the University of Pittsburgh School of Nursing, Pittsburgh, PA. A sample scenario created for students enrolled in an advanced course on obstetric nursing is presented. It consisted of freshman through senior years in a baccalaureate curriculum.	A purposive sample of thirty -two international experts in HPSM use in nursing education was invited to participate in the Delphi study. Participants were selected upon the following criteria: editors or chapter authority of internationally recognized textbooks on the use of simulation in nursing, keynote speakers at simulation conferences, authors of research papers on simulation in nursing, published in peer reviewed nursing journals, executive members of Australian Simulation Society, Executive members of INACSL, Australian and international nurse academics chosen for their experience in simulation.	This study sample included students enrolled in their first clinical course in a baccalaureate nursing program. Demographic data for the entire cohort of students revealed 84% females, with ages from 19-48 years (mean= 23.6 years). Students' self-reported race/ethnicity was as follows: 75% White, 12% Asian, 2% Hispanic,1% Native American , and 9% undisclosed. Of the 100 students enrolled, between 64 and 99 students participated in one of more of the simulation exercises. Faculty participates included 7 females and 1 male, with ages ranging from 26-59 years (mead= 45 years). All instructors were White, non-Hispanic. Teaching experience ranged from 3 years to 26 years. All faculty had attained Master's in Nursing preparation.	A convenience sample of 26 new graduate nurses who recruited to work at a large urban hospital between May 2009 and June 2010 participated in the study. The sample included those hired to work in adult health areas of the hospital, with the exception of those hired for oncology, rehabilitation, and critical care units. These new graduates were excluded because of their orientation differs from that of most new hires. A computerized table of random numbers was used to assign the graduate nurses who agreed to participate in the study.	Sixty fourth year baccalaureate nursing students were recruited from a university in urban Canada. Using random allocation, 15 participants were to each of the four intervention groups. An initial phone interview was used to confirm whether the students had previously completed more than 10 IV starts. They used advertisements to recruit three experienced RNs from a blood donation clinic. These clinically experienced nurses provided performance data that was used to determine the proficiency criterion for each simulator.	

Evaluation criteria might be quantitative, for example, binary done vs. not done or percentage of behavior met correctly. Precourse and post course surveys may elicit qualitative data, such as students rating their level of comfort with certain conditions on a Likert scale.	Delphi technique that consisted of several rounds: First round-Development of questionnaire tool, study sample and participation, data. Round 2: Questionnaire development and analysis of results, verification of quality indicator statements.	A prospective, descriptive, repeated measures design was used among 100 undergraduate nursing students to evaluate three scenarios written by faculty. Educational practices, simulation design, and student satisfaction and self-confidence were evaluated using tools obtained from the National League for Nursing. Faculty and student comments about using the medium fidelity simulation with VitalSim mannequin as a teaching methodology in the first semester undergraduate nursing curriculum. A convenience sample of undergraduate nursing student body was used, as faculty wanted to provide equal learning opportunities to all students, instead of a control/experimental groups.	A pre-test-posttest design was used to assess critical thinking and clinical decision-making skills in two groups of graduate nurses who were exposed to two different new nurse orientations. One included high-fidelity patient simulation and one did not.	Using a randomized control, four-arm experimental design. Randomization was terrified by participant sex. Only six participants were males:	
Faculty who implement simulation meet together to evaluate student outcomes and plan for any revisions. Assessment of effectiveness of the cognitive, psychomotor, and affective components of simulation is essential. Outcomes can be incorporated into the course and the school of Nursing evaluation systems.	The expert opinions of the participates were consistent with the literature review findings overall. In particular the need for clear objectives to guide all aspects of simulation design, the importance of adequately trained and skilled staff for simulation activities, student preparation, and debriefing and curriculum integration were identified as critical from the ranked data that was obtained from the study.	The Educational Practices Questionnaire (EPQ), which assesses the utilization of best practices in simulation, had a near score of 71+ or - 6, 69+ or -9, and 71+ or-for respective simulation. Students perceived that best practices (active learning, collaboration, diverse ways of learning and high expectations) were employed in each scenario. The importance of the educational practices rated at 73+ or-7, 72+or-8. and 73+ or -7 for each scenario signifying that students agreed that the items listed on the questionnaire were very important. There were no differences between simulations.	When mean scores were analyzed, both groups showed an increase in critical thinking scores from pretest to posttest, with the high-fidelity patient simulation group showing greater gains in overall scores. However, neither group showed a statistically significant increase in the mean test scores. The effect of high-fidelity patient simulation on critical thinking and clinical decision-making skills remain unclear.	The proficiency-based students scored highest on the high-fidelity post-test (effect size=1.22). An interaction effect showed that the Progressive and Open-ended groups maintained their performance from post-test to transfer test, whereas the Proficiency-based and Yoke control groups experienced a significant decrease ($P<0.05$). Surprisingly, most Open-ended students (73%) chose the progressive practice schedule.	

Simulation production is resource intensive, but the benefits are worthwhile. Students respond very favorably to the structured experiences conducted in a safe environment. The established template within this study might ease the way for other nursing schools to explore simulation as an educational method in a baccalaureate nursing program.	The quality indicator statement resulting from the Delphi study will be of benefit to academics with interest in the design, implementation, and integration of simulation. They provide synthesis of research findings and expert opinion about clinical simulation and factors that should be considered for curriculum integration.	This study reports the results of a two=day paid containing educational experience reinforced with mentoring of an experienced faculty member and lab preceptors to integrate simulation into a course. The faculty reported that multitasking proved what happened in a scenario very challenging. As faculty gain experience, they were more likely to relinquish a role in the simulation lab. All students passed the end of course paper and pencil exam for the first time in collective memory, the attribution of this occurrence to simulation alone, though intriguing, is premature. Further observation and study is warranted.	The study results suggest that high-fidelity patient simulation, when added to new nurse orientation, does not significantly improve critical thinking or clinical decision making skills in new graduate nurses. However, the results suggest that new nurse orientation, regardless of whether it includes traditional or simulation methods, significantly improves the analysis sub-scale score.	Progressive training and proficiency-based training resulted in equivalent transfer test performance, suggesting that progressive students effectively self-guided when to transition between simulators. Student's preference for the progressive practice schedule indicates that educators should consider this sequence for simulation-based training.	

Exposing students to simulation, preparing properly prior to the simulation, use of moulage with simulation, take time to practice with all role players, make sure the computers are working, take the time to explain the purpose of simulation, debriefing is conducted immediately following the enactment, equipment is readily available for students to view their behaviors allows the meaning of the experience to the students.	Further research is currently being undertaken to develop and test instruments that will facilitate the use of these indicators for evaluation of simulation experiences. The most common limitation of the Delphi method is difficulty generalizing the results based on sample size, limited spectrum of views and geographic location of participants. The choice of international panel for this study with a high level of credibility and experience in the field had minimized this concern to some extent.	One cohort of students in a single geographic location was used. The design of the study did not allow for comparisons between students exposed to simulation and students not exposed to simulation. Many novice faculty members ran and debriefed their own scenarios. Results might have been different if the simulations had been run by the same one of two faculty members rather that eight different faculty members, all relatively new to simulation and debriefing. Results might also change as faculty members become more experiences running simulations and debriefing sessions.	The limited sample size may have resulted in a typed II error and does not allow for generalization of the findings. Replication with a larger sample size is needed. Another factor was the overall strength of the initial HRST scores for all subjects; with the mean pretest HSRT score 1.52 points higher than the national norm comparison group. Lack of support from nurse managers was an unexpected variable that was introduced into the study. Their attitude inadvertently or intentionally sent the message their participation in the study inconvenienced the unit and when they left the unit they were missing time with their preceptors. Subjects in the control group expressed disappointment when they learned they were not going to receive any simulation experience. Given two factors, there was a concern that subjects in both groups might not have been motivated to do their best on the posttest.	They did not generalize their findings beyond IV catherizations to more complex skills. They recruited "proficient RNs" from a convenience population and they may have not represented the population criterion for practical purposes. The observed interclass correlation values were in the below to acceptable range for most dependent measures. While the low values are of concern, they are close to those generally reported in previous work. This study does not demonstrate the comparative efficacy of self-versus other - guidance.	A critique of the National League for Nursing/ Jeffries simulation framework/Journal of Advanced Nursing	
Nothing	Australian Learning and Teaching Council (ALTC).	None	This study was made possible through a grant provided by the South Central PA Organization of Nurse Leaders. The authors have disclosed no potential conflicts of interest, financial or otherwise.	This project was supported by a grant from the National Sciences and Engineering Research Council (NSERC).	Cynthia LaFond, and Catherine Vincent/2012	

This study gave supporting evidence of the importance and how to run a simulation lab for the effectiveness and to coordinate the progression of simulation in nursing programs. They used the frameworks of the American Association of College of Nursing (AACN) essentials and education theories to create case scenarios. The benefits of simulation experiences for students were discussed and a template for nursing educators is provided to help develop simulation. This evidence supports the importance for me to have a solid scenario to display chest tube management to instill in the nursing students the knowledge and skills to manage a chest tube successfully.	This study reinforced the importance of simulation design, the skilled staff that is required to perform the scenarios, proper student preparation will be important prior to running the chest tube scenario, completing a formal debriefing, and to ensure that simulation should continue to be an integrated part of the curriculum throughout the course of the nursing program.	Great insight for guidance on the types of faculty to use for the simulations. Perhaps the less is better and those more experienced in simulation to obtain better outcome results.	This article expounded on the need to prepare our new graduate nurses for critical thinking through the use of simulation, but the results did not support it as a positive outcome. I feel that we as nurse educators need to properly prepare our graduates to enter the work force as well as the employers/mentors need to support the new hired nurses to retain and recruit the nursing population or the shortage will continue to grow.	A tool for nurse educators to guide and use simulation properly for the students and to make it be effective.	PubMed, CINHAL: middle-range theory, nurses, nursing education, nursing theory, simulation
	A survey instrument was designed, pilot tested, and administered to informants from clinical agencies used by the undergraduate nursing program as practice sites. The interview schedule gathered data describing the sites, nursing education role and policies, and IT practice and policies. Open-ended questions solicited information regarding additional competencies, agencies perceptions of barriers to and facilitators of nursing student IT competency attainment, and	A mixed methods approach was adopted, "the mixed method central premise is that the use of quantitative and qualitative data in combination provides a better understanding of the research problem.	The purpose of the research reported was to investigate the extent to which student experiences with multiple-patient simulation improved students' patient safety competencies and the student factors that were related to that outcome.		Fawcett's criteria for theory analysis and evaluation are used. Concepts, variables, and propositions of the NLN/Jeffries simulation framework consisted of students, teachers, educational practices, simulation design characteristics, and outcomes.

	recommendations. Descriptive data was tallied, and recorded.					
	Level II/IV	Level I/I/I	Level I/I/II	Level I/I	Level II/VII	
This paper describes a study that measures and compared knowledge acquisition in nursing students exposed to medium or high fidelity of human patient simulation manikins.	Baccalaureate nurses must meet information technology (IT) competencies expectations for employment and future professional development. This study looked at students and faculty practicing in clinical agencies undergoing an informatics and technology revolution, however there is little know regarding nursing students' experiences with IT in clinical practice.	The rationale for the study which was designed to explore the relationship between simulation, theory, and practice.	The purpose of the research reported was to investigate the extent to which student experiences with multiple-patient simulation improved students' patient safety competencies and the student factors that were related to that outcome.	The aim of this analysis was to interrogate the concept of simulation as a learning strategy in the education of undergraduate nursing students.	The aim of this study is to present a critique of the National League for Nursing/Jeffries (NLN/JFS) simulation framework.	

Eighty-four Australian third year nursing students bachelor of nursing program across three campuses participated. It was advertises by Blackboard, to invite to participate in the undertaking a simulated learning experience. Their ages ranged from 20-54 years. Students aged 19-22 years comprised of 45% of the sample; those aged 23years and older comprised the other 55% of the sample. Most (85%) were women. The majority of participants (74%) were Australia as their country of birth. The remainder were from Korea, China, Canada, England, Philippines, Singapore, Botswana, Zambia or New Zealand; none of the participants identified as being of Aboriginal or Torres Strait Islander decent.	A survey instrument was designed, pilot tested, and administered to informants from clinical agencies used by the undergraduate nursing program as practice sites. The interview schedule gathered data describing the sites, nursing education role and policies, and IT practice and policies. Open-ended questions solicited information regarding additional competencies, agencies perceptions of barriers to and facilitators of nursing student IT competency attainment, and recommendations. Descriptive data was tallied, and recorded.	This integration has become an embedded feature of the pre-registration nursing program at the University in the North of England, along with strategic investment in staff and simulation suites developed to underpin curriculum change. This study featured a questionnaire from pre-registration student nurses (n=>500) collected over a 2-year period which informed a focus group interviews to explore the themes in more detail.	A purposive sample was used consisting of students in their final semester of the program at 8 Indiana University system schools of nursing. The student participants in this sample represented rural and urban campuses, baccalaureate degree and associate degree nursing programs, and student class sizes ranging from 14-120 students. The mean age of the student sample was 29 years, ranging from 21-56, with 91% being female. The overall GPA of the student participants was 3.4 The purpose of this study did not affect course grading of standing.	Undergraduate nursing students The analysis outlined in this paper was guided by a systematic process of studying a concept presented by Walker and Avant (2005). The analysis sought to identify how the concept of simulation is interpreted in the existing literature printed in English and retrieved from databases Medline, CINAHL, PubMed, and Cochrane Library, internet search engines (Google Scholar) and hand searches.	Data sources of a literature search using Cumulative Index to Nursing Allied Health Literature PubMed and Google Scholar to identify studies published in the English language, between 2005-June 2011, were the National League for Nursing /Jeffries simulation framework was tested or used as a theoretical framework for research.	

examine the impact of high and medium fidelity simulation experiences on nursing students' knowledge acquisition/Nurse Education in Practice	A survey instrument was designed, pilot tested, and administered to informants from clinical agencies used by the undergraduate nursing program as practice sites. The interview schedule gathered data describing the sites, nursing education role and policies, and IT practice and policies. Open-ended questions solicited information regarding additional competencies, agencies perceptions of barriers to and facilitators of nursing student IT competency attainment, and recommendations. Descriptive data was tallied, and recorded.	The study took a "two phased" approach to data collection: Phase one included an evaluative questionnaire. Analysis of phase one data formed the basis for stage two which incorporated semi structured focus group interviews.	The purpose of the research reported was to investigate the extent to which student experiences with multiple-patient simulation improved students' patient safety competencies and the student factors that were related to that outcome.	Various models for concept analysis exist-many which are based of Wilson (1963). He proposed an eight step systematic process to study a concept. These steps include: select concept, determine purpose, identify uses, define attributes, identify model cases, identify antecedents and consequences and define empirical referents.	The Fawcett theory analysis includes three steps: examining theory scope, context, and content. Evaluation of the theory includes six criteria: significance, internal consistency, parsimony, testability, empirical adequacy, and pragmatic adequacy.	

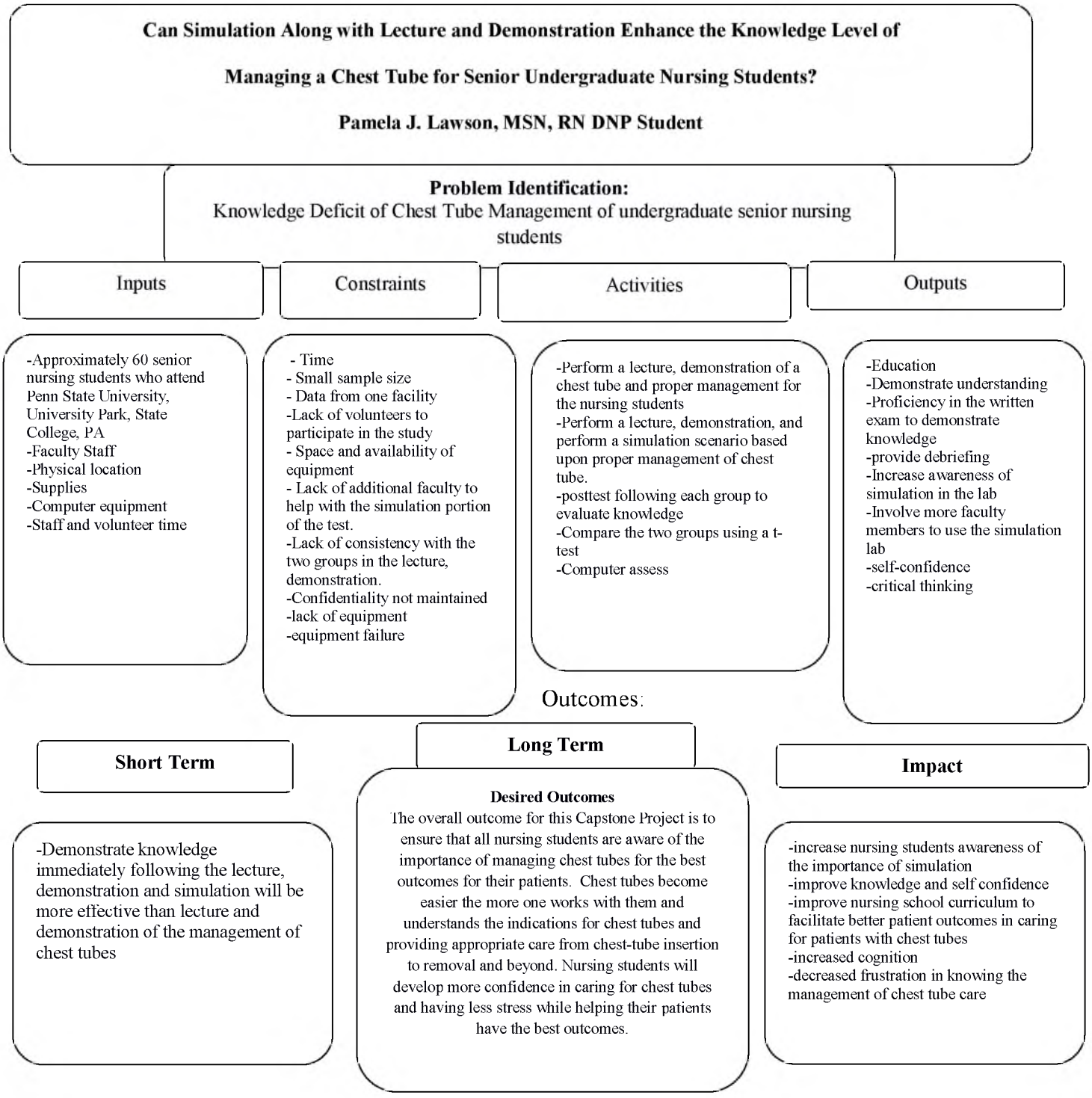
The differences in mean scores between the control group (medium fidelity) and the experimental (high fidelity) groups for Tests 1, 2, and 3 were calculated using independent t-tests and were not statistically significant. Analysis of covariance (ANCOVA) was conducted to determine whether changes in knowledge scores occurred over time and, while an improvement in scores was observed, it was not statistically significant. The results of this study raise questions about the value of investing in expensive simulation modalities when the increased costs associated with high fidelity manikins may not be justified by a concomitant increase learning outcomes. This study also suggests that multiple choice questions may not be the most appropriate measure of simulation effectiveness.	Data were analyzed related to the agencies, their IT practices and policies, perceptions of factors affecting students' competencies attainment, and future priorities. Of 23 sites contacted, 21 sites participated, which included 3 academic health systems, 3 specialty hospitals, (one not for profit), 2 home health/community agencies, 11 single institutions operating within health systems, a nationwide governmental institution affiliated with an academic health center, and medical school and a for-profit system. in 17 sites, IT and nursing staff development provided data; nurse educators were the sold information sources for 4 agencies. The agencies report average daily censuses/visits ranging from 80 to more than 1500 patients. They host between 4 and more than 100 to more than 1000 students and faculty from over 30 different nursing programs.	Eight themes were noted: the enjoyment of simulation as a learning strategy, the students learning styles and how simulation supported the implementation of theory and practice. In addition, simulation was identified as a low risk learning situation that also enabled the students to improve their confidence in skills prior to exposure to the clinical practice. Other themes identified include professionalism and the simulated environment as a positive recruitment tool.	Using a paired t-test, the results contributed to the science of nursing education by providing evidence for nursing educators related to the impact of multiple-patient simulations on improving and documenting students' patient safety competencies before their entry into the workforce. The study showed that students' safety competencies improved significantly from the first to the second simulation. There were significant differences in the implementing of safety over the course of 2 experiences in caring for 4 simulated patients from week 3to week10 (t=-4.00, degrees of freedom=66, and P<.0002). The mean score for patient safety scale for first time experience was 11.48 and the second time was 13.88. This hypothesis supports patient safety improves with multiple - patient simulations,	In summary from the literature reviewed the use of simulation as a learning strategy in the education of undergraduate nursing students describes a dynamic process with five critical attributes that constitute the phenomenon: creating a hypothetical opportunity, authentic representation, active participation, integration, repetition, evaluation, and reflection.	Overall, the NLN/JSF offers educators a structure to construct and implement simulation experiences that produce positive student-learning outcomes. Because NLN/JSF has a strong foundation of theoretical and empirical evidence and its concepts of educational practices and simulation design characteristics are supported in research, nurse educators should strive to include the variables of these concepts in simulated learning experiences.	

In this study nursing students' knowledge acquisition scored were not improved by exposure to either medium or high fidelity human patient simulation. The authors suggest that evaluation methods should be more closely aligned with the learning objectives of simulation sessions and directly target the assessment of higher orders skills such as critical thinking and clinical reasoning. Future studies should be considered whether or not simulation sessions translate to clinical practice and improved patient outcomes.	The results support contentions that improving the integration of health informative, technologies, and information literacy is a significant priority and challenge for nursing education programs, policy groups, and clinical agencies.	The evidence from the study confirms simulation allows students to be active rather than passive recipients within their learning experiences. Simulation learning was evaluated positively by the majority of students in this study. This study suggests that simulation provides a deeper learning experience which impacts upon patient care.	Giving students multiple patient simulations significantly improves students' patient safety competencies.	This analysis has identified that simulated learning is a dynamic concept that deserves empirical evaluation not merely to determine its effects but to uncover its full potential as a learning strategy. Defining the attributes of simulation provides educators of nursing with focus from which to develop greater understanding of both process and outcomes of utilizing simulation as a learning strategy.	Based on the findings from this study, it is possible student variables may not directly contribute to outcomes as proposed if considered in the simulation design. Of the proposed NLN/JSF outcomes, learning, skill performance, and critical thinking require further study.	
There was no mention of any strengths or limitations within this study.	This evaluation study explores barriers to nursing student information technology (IT) learning, which have implications for nursing education, practice, and research. Some limitations warrant cautious application of these results. Convenience sampling in one geographic area may not be reflective on other areas of the country.	A limitation of this study is that data collected represents the subjective students' perspective. The main contribution that has been achieved by this study was to obtain the students views of their experience, objectivity not effectively being an issues. The amount of data collected over a two year period gave consistency and strength to the findings.	A limitation is the control of confounding variables; thus an exploratory rather than experimental design was used. Another limitation is that is does not evaluate the extent to which behaviors demonstrated in a simulation activity directly transfer to actual clinical settings. All the students participating were from a major research university and may not be generalizable to other geographic areas of the country, other levels of education, and types of programs.	A significant implication is the measurement of transferable knowledge, skills, and attitudes acquired through simulated learning are clearly an essential focus on future research. This requires the study of the critical attributes this analysis has identified. Interrogation of how authentic simulated learning needs to be in order for the student to suspend disbelief and engage in learning remains elusive.	Furthermore, more studies outside of the United States are needed to confirm the framework is relevant to nursing programs in other countries.	
Support for this project was provided by the Australian, Learning and Teaching Council, Ltd, an initiative of the Australian Government Department of Education,	None	None	None	None	This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.	

Employment and Workplace Relations					
It was interesting to see the study not encouraging the use of simulation due to the increasing cost and maintenance. Also to look at the types of questions I will use for my capstone project and disregard the use of multiple choice questions for the pre and posttests.	Literature review looking at nursing students and not being prepared for the future of IT roles. With the use of IT in every aspect of nursing, it is important to provide excellent training and practice in IT.	Supporting documentation of the use of simulation does indeed improve the learning process by the students to improve patient care.	Makes note of safety again and the use of multiple patient simulation. Repetition is good for any learner and educator to ensure the safety competencies that are imperative to the art and science of nursing.	This article gave a very large number of references and population of persons who have done a lot of research in simulation and providing support evidence of simulation for my paper.	A use of Jeffries simulation framework that is approved by the National League for Nursing will be a great tool for my research to support the documentation

Appendix B

Logic Model/Conceptual Model



Adapted from "Logic Model for Actual DNP Project" by M.E. Zimmerman, 2007, and "Template for Logic Model of Project: by K.W. White and M.E. Zaccagnini, 2009, (as cited in Zaccagnini, M.E., & White, K. W. (Eds.), *The doctor of nursing practice essentials: A new model for advanced practice nursing*. Copyright 2011 by Jones and Bartlett.

Appendix C

Measurement Tool/Instrument

ID # _____

DNP Capstone Project Demographic Information

Please complete the following questions.

1. What is your birthdate?

2. What is your gender?

3. What is your ethnicity?

4. What is your level of knowledge of chest tubes? (circle one answer)
    a. None
    b. Little
    c. Some
    d. Alot

Pre/Post-test Questions

1. The purpose of a chest tube is for removal or drainage of air, blood, or fluid from the intrapleural or mediastinal space.

TRUE_____ FALSE_____

2. A pneumothorax can be classified as three types. What are they?

    1._____

    2._____

    3._____

3. Chest tubes are most frequently inserted in the right or left second intercostal space for air.

TRUE_____FALSE_____

4. What is most helpful in confirming placement of tube, and re-expansion of lung and removal of fluid?

_____

5. A consent form is required prior to a chest tube inserted.

TRUE_____FALSE_____

6. When are chest tubes removed?

_____

7. When preparing for chest tube removal, suction is to be discontinued and checking for bubbling in water-seal chamber for air leakage is to be monitored. If air leak is present the chest tube should not be removed.

TRUE_____FALSE_____

8. When a chest tube is removed what maneuver is needed to provide positive pressure in the pleural cavity thus preventing accidental entrance of air into the pleural space. The chest tube can then be discontinued during end inspiratory or end expiratory phase with patient instructed to hold their breath until tube is out and sutures are secure.

_____

9. A portable chest x-ray should be obtained generally 1 to 24 hours after chest tube is discontinued, or stat if patient shows signs of increased work of breathing, decreased oxygen saturation, increase restlessness, chest discomfort, or diminished breath sounds.

TRUE_____FALSE_____

10. Chest tube removal is not performed by any nursing staff per institutional standards of care.

TRUE_____FALSE_____

11. Which of the following items should the nurse have placed in the client's room? (Select all that apply.)

_____Oxygen

_____Sterile Water

_____Enclosed hemostat clamps

_____Indwelling urinary catheter

_____Occlusive dressing

_____Suction source

_____Bladder scan machine

12. While assessing the client, the nurse notices that the client's chest tube has become dislodged. Which is the following actions should the nurse take first?

a. Place the tubing into sterile water to restore the water seal

b. Apply sterile gauze to the site.

c. Tape or clamp all connections

d. Assess the client's respiratory status.

13. A nurse is assessing the functioning of a client's chest drainage system. Which of the following are expected client findings? (Select all that apply.)

_____Continuous bubbling in the water seal chamber

_____Gentle constant bubbling in the suction control chamber

_____Rise and fall in the level of water in the water seal chamber with inspiration and expiration.

_____ Exposed sutures without dressing

_____Drainage system is upright at chest level

14. A nurse is assisting a provider with the removal of a chest tube. Which of the following should the nurse instruct the client to do?

a. Lie on his left side during removal.

b. Hold his breath.

c. Inhale deeply during removal.

d. Perform the Valsalva maneuver during the removal.

15. To maintain the water seal, the chamber must be kept upright and above the chest tube insertion site at all times.

TRUE_____FALSE_____

16. Cessation of tidaling in the water seal chamber signals lung reexpansion or an obstruction within the system.

TRUE_____FALSE_____

17. What causes the water level to rise with expiration and fall with inspiration?

_____

18. Chest tube drainage will often decrease with position changes or coughing?

TRUE_____FALSE_____

19. What position is the client placed in to promote optimal lung expansion and drainage of fluid from the lungs?

_____

20. Stripping or milking of chest tubes cause destruction of lung tissue?

TRUE_____FALSE_____

Appendix D

Timeframe for DNP Project

PICO statement created	PICO statement revised and approved	SRE Literature Review Began	SRE excel spread sheet completed and approved	IRB Application for Study University approved- Exempt status	IRB Application for Regis University approved-
SEPT 2011	FEB 2012	MAR 2012	NOV 2012	DEC 17, 2012	MAR 01, 2013

Received DNP-c upon completion of presentation	DNP Capstone Project Study Completed	DNP Convocation and Graduation at Regis University	Data Collection obtained and completed SPSS	DNP Capstone Final Presentation	Pamela Lawson DNP, RN
APR 08, 2013	APR 13, 2013	MAY 04, 05, 2013	MAY 29, 2013	JUL 22, 2013	AUG 2013

Appendix E

Budget and Resources

Project Resources	**Cost of Resources**	**Total Budget**
Faculty Assistant	$40.00/hour	$200.00
Classroom Space/Use of facility	Use of existing lab $500.00	$1000.00
Equipment: Computer, printer, toner, paper	$120.00	$250.00
Total Cost:	**$780.00**	**$1450.00**

Appendix F

IRB Approval Letter- Penn State University

PENNSTATE

Vice President for Research
Office for Research Protections

The Pennsylvania State University
The 330 Building, Suite 205

Phone : (814) 863-1775
Fax: (814) 863-8699
Email : [redacted]
Web : www.research.psu.edu/orp

Date: December 17, 2012

From: The Office for Research Protections - FWA#: FWA00001534
Stephanie L. Krout, Compliance Coordinator

To: Pamela J. Lawson

Re: Determination of Exemption

IRB Protocol ID: 41825
Follow-up Date: December 16, 2017
Title of Protocol: Capstone Question: Can simulation along with lecture and demonstration enhance the knowledge level of chest tube management for senior undergraduate nursing students?

The Office for Research Protections (ORP) has received and reviewed the above referenced eSubmission application. It has been determined that your research is exempt from IRB initial and ongoing review, as currently described in the application. You may begin your research.

COMMENT: Proper documentation from the IRB office at Regis University is to be obtained and kept in your research records. This letter does NOT need to be submitted to our office; however, a copy could be requested at any time.

The category within the federal regulations under which your research is exempt is:
45 CFR 46.101(b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

Given that the IRB is not involved in the initial and ongoing review of this research, it is the investigator's responsibility to review IRB Policy III "Exempt Review Process and Determination" which outlines:

- What it means to be exempt and how determinations are made
- What changes to the research protocol are and are not required to be reported to the ORP
- Ongoing actions post-exemption determination including addressing problems and complaints, reporting closed research to the ORP and research audits
- What occurs at the time of follow-up

Please do not hesitate to contact the Office for Research Protections (ORP) if you have any questions or concerns. Thank you for your continued efforts in protecting human participants in research. This correspondence should be maintained with your research records.

Appendix G

IRB Approval Letter- Regis University

REGIS UNIVERSITY
Academic Affairs
Academic Grants

3325 Regis Boulevard, H-4
Denver, Colorado 80221-1099
303-458-4018
303 964 5526 FAX
www.regis.edu

IRB – REGIS UNIVERSITY

March 1, 2013

Pamela Lawson
43 W. Market Street
Lewistown, PA 17044

RE: IRB #: 13-085

Dear Ms. Lawson:

Your application to the Regis IRB for your project "Can Simulation Along with Lecture and Demonstration Enhance the Knowledge Level of Managing a Chest Tube for Senior Undergraduate Nursing Students?" was approved as an exempt study on March 1, 2013. This study was approved per exempt study category 45CFR46.101.b(#1).

The designation of "exempt," means no further IRB review of this project, as it is currently designed, is needed.

If changes are made in the research plan that significantly alter the involvement of human subjects from that which was approved in the named application, the new research plan must be resubmitted to the Regis IRB for approval.

Sincerely,

Patsy McGuire Cullen

Patsy McGuire Cullen, PhD, CPNP
Chair, Institutional Review Board
Associate Professor and Director
Department of Accelerated Nursing
Loretto Heights School of Nursing
Rueckert-Hartman College for Health Professions
Regis University

cc: Dr. Louise Suit

Appendix H

CITI Training Certification

CITI Collaborative Institutional Training Initiative

Human Research Curriculum Completion Report
Printed on 9/19/2012

Learner: Pamela Lawson (username: LTCLawson)
Institution: Regis University
Contact Information
43 W. Market Street
Lewistown, PA 17044 USA
Department: Nursing
Phone: 717-994-4267
Email: pjl126@psu.edu

Social Behavioral Research Investigators and Key Personnel:

Stage 2. Refresher Course Passed on 09/18/12 (Ref # 8790543)

Required Modules	Date Completed	
Biomedical 101 Refresher Course - Introduction	09/18/12	no quiz
SBR 101 REFRESHER MODULE 1 - History and Ethics	09/18/12	5/5 (100%)
SBR 101 REFRESHER MODULE 2 - Regulatory Overview	09/18/12	5/5 (100%)
SBR 101 REFRESHER MODULE 3 - Risk, Informed Consent, and Privacy and Confidentiality	09/18/12	5/5 (100%)
SBR 101 REFRESHER MODULE 4 - Vulnerable Subjects	09/18/12	4/4 (100%)
SBR 101 REFRESHER MODULE 5 - Education, International, and Internet Research	09/18/12	5/5 (100%)
How to Complete The CITI Refresher Course and Receive the Completion Report	09/18/12	no quiz

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

Return

Appendix I

CITI Certification

CITI Collaborative Institutional Training Initiative

Human Subjects Research Curriculum Completion Report
Printed on 12/17/2012

Learner: Mary Anne Ventura (username: muv113)
Institution: Pennsylvania State University
Contact Information Room 22 HHD East
University Park, PA 16801 USA
Department: nursing
Phone: 814-867-3058
Email: muv113@psu.edu

Biomedical Human Subjects Research (IRB) Course:

Stage 1. Basic Course Passed on 12/17/12 (Ref # 9342291)

Required Modules	**Date Completed**	**Score**
Pennsylvania State University	12/17/12	no quiz
Research and HIPAA Privacy Protections	12/17/12	4/4 (100%)
Belmont Report and CITI Course Introduction	12/17/12	3/3 (100%)
History and Ethical Principles	12/17/12	6/6 (100%)
Basic Institutional Review Board (IRB) Regulations and Review Process	12/17/12	5/5 (100%)
Informed Consent	12/17/12	4/4 (100%)
Social and Behavioral Research for Biomedical Researchers	12/17/12	4/4 (100%)
Research With Protected Populations - Vulnerable Subjects: An Overview	12/17/12	4/4 (100%)
Conflicts of Interest in Research Involving Human Subjects	12/17/12	5/5 (100%)
Elective Modules	**Date Completed**	**Score**
Avoiding Group Harms: U.S. Research Perspectives	12/17/12	1/3 (33%)

For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

Return

Appendix J

PENNSTATE

School of Nursing
The Pennsylvania State University
201 Health and Human Development East
University Park, PA 16802-6508

814-863-0245
Fax: 814-865-3779
www.nursing.psu.edu

February 22, 2013

RE: Pamela Lawson's Capstone Project

To Whom It May Concern:

Ms. Lawson has obtained full Penn State University IRB approval to conduct her research. In addition, she has full authorization from the School of Nursing to utilize Nursing's Simulation Laboratory as the data collection site and to recruit Penn State nursing students to participate as subjects for her capstone project.

Please do not hesitate to contact me if you need further information.

Sincerely,

Raymonde Ann Brown

Raymonde A. Brown, PhD, RN, CNE
Associate Dean, Undergraduate Programs
and Outreach

Appendix K

Cover Letter

My name is Pamela J. Lawson. I am a student/candidate degree program at Regis University. My contact information is: 43 Market Street, Lewistown, PA 17044, 717-994-4267. I am conducting a research study entitled "**Can simulation along with lecture and demonstration enhance the knowledge of managing a chest tube for senior undergraduate nursing students?**

I am asking you to participate in this study because my population is senior nursing students attending a baccalaureate nursing program in an Eastern University of United States. Your participation is voluntary. Choosing not to participate will not affect your educational progression of grade point average. There are no direct benefits to participating in the study.

I will be conducting the study by asking you to complete a pre-test and a post-test of managing a chest tube. I will ask you to complete an evaluation survey using a Likert score about your overall experience during the study. Participation in this study will be completed in one day and will take approximately three hours. There will be no cost associated with this study to any participates.

I will not be collecting any data that can link you to the answers you provide. Your anonymity and the confidentiality of your responses will be protected as much as possible. If you are uncomfortable answering any question, you may choose to not answer that question or to stop your participation and have any notes, recordings, or hard copy answers destroyed. To further protect the confidentiality of your responses, I will not be collecting a signed consent form but will instead consider your participation in the study as consent permitting me to collect the data you provide.

Should you have any questions or concerns about participation in this study, you may contact me using the information in the first paragraph. My faculty Advisor is Dr. Marsha Gilbert; email: mgilbert@worldclass.regis.edu; phone: 303-964-5189.) You may also contact the Chair of the Regis University Institutional Review Board for human subjects participation by telephone at 303-346-4206; by mail at Regis University, Office of Academic Grants, 447 Main, Mail Code H-4, 3333 Regis Blvd., Denver, CO, 80221; or by e-mail at irb@regis.edu with questions or concerns, or if you feel that participation in this study has resulted in some harm.

Sincerely,

Pamela J. Lawson