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Nursing Students' Experiences Using High-Fidelity Cardiovascular Simulation: a Descriptive Study

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Regis University
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Final Project/Thesis

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Nursing Students' Experiences Using High-Fidelity Cardiovascular Simulation:

A Descriptive Study

Teresa A. Paden

Submitted in Partial Fulfillment for the Doctor of Nursing Practice

Regis University

April 9, 2012

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Executive Summary

Nursing Students' Experiences Using High-Fidelity Cardiovascular Simulation: A Descriptive Study

Problem

Many challenges face nursing faculty today as they prepare nursing students for safe practice in a complex health care environment. The challenge of limited clinical sites for nursing students to have hands on experiences is a major challenge in education. An alternative to these clinical sites was simulation scenarios on campus in nursing skill labs or simulation labs. This relevant nursing education issue was formulated into PICO statement: Do nursing students' experiences using high-fidelity cardiovascular simulations have an effect on their overall cognition, self-confidence, and satisfaction in this learning environment?

Purpose

The purpose of this project is to study the impact of a cardiovascular simulation laboratory experience on the nursing students' satisfaction, self-confidence, and cognitive learning.

Goal

The goal of the project was to provide evidenced-based practice findings related to the benefit of high-fidelity simulation in nursing education and to implement these findings into nursing education practice. The project was able to meet this goal by setting specific and measurable objectives.

Objectives

The project objectives of the project were to (1) measure improvement in applications, analysis, and synthesis of specific knowledge related to cardiovascular disease following a simulation scenario, (2) analyze the nursing students' confidence level of delivering patient care following a simulation scenario, and (3) analyze nursing students' satisfaction with the simulation educational experience.

Plan

The need for alternative clinical learning sites for nursing education was identified as a problem through a needs assessment. The systematic literature review (SLR) supported this need and provided an in depth understanding of the issue as well as contributing research for a theory to support the project. A timeline was developed for the project including the selection of a team for the project. Goals of the project were identified and objectives developed. IRB approval was obtained through Regis University and permission was obtained by the college to conduct the project. The data obtained from the project included results from a 25 item demographic questionnaire that identified specific population descriptions. A pretest was given prior to the simulation scenario to measure overall change in cognition while a post-scenario survey was provided to measure student confidence and satisfaction.

Outcomes

The paired sample t-test results showed improved scores in the posttest, giving evidence that simulation does improve cognitive knowledge. Four demographic variables were selected to provide further insight into the test results: students' age, education level, previous clinical remediation, and previous simulation experience. The older students had lower overall scores and improved less than the younger students. Students that had multiple clinical and skill lab remediations also scored the lowest and improved less than students who had no remediations. Self-confidence levels scored high following the simulation scenario and students were highly satisfied with the simulation experience.

Acknowledgement

I would especially like to thank my husband, Gary, for all the support he has provided during the process of pursuing the Doctorate in Nursing Practice Degree. He has always given me warm encouragement and patience during stressful times in my journey. I believe I owe my deepest thanks to him for supporting this endeavor from its conception to its completion.

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Nursing Students' Experiences Using High-Fidelity Cardiovascular Simulation: A Descriptive Study

In recent years high-fidelity simulation in nursing has become an increasingly popular education tool (Sanford, 2010). Many nursing programs throughout the United States and abroad have incorporated simulation into their nursing program curricula. In 2003, the National League of Nurses (NLN) endorsed the use of simulation in order to prepare students for critical thinking, self-reflection and the complex clinical environment (Jeffries, 2007).

Simulation was defined as the creation of an event, situation or environment that closely mirrors what one would encounter in the “real world” (Cioffi, 2001; Rauen, 2001). Simulations were designed to motivate students to actively participate in the learning process by constructing knowledge, exploring assumptions and developing psychomotor skills in a safe environment (Tomey, 2003). High Fidelity Human Simulation (HFHS) was an experiential action assessment method using a lifelike computerized mannequin that can be programmed to respond to real-world inputs (Fero et al., 2010). Commonly identified benefits of simulation include improved skill performance, teamwork, effective communication, and the opportunity to observe the consequences of incorrect decisions as well as the achievement of competencies and the effects of medication administration (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008).

Another identified outcome of simulation was self-confidence building for the nursing student. Simulation experiences were effective in increasing students' self-efficacy in their ability to perform clinical skills (Bambini, Washburn, & Perkins, 2009). The level of self-efficacy was dependent on student performance during the simulation scenario. The goal for simulation in relation to self-efficacy was to improve student confidence when transferring learning to nursing practice.

Problem Recognition and Definition

Many challenges face nursing faculty today to prepare competent nursing students for safe practice in a complex health care environment. The Institute of Medicine's (IOM) position statement explains nursing competency plays a vital role in assuring patient safety (IOM, 2004). Given the known risks to patient safety which were inherent in traditional clinical teaching models, it was imperative that innovative teaching and evaluation methods be employed to support the development of critical thinking and improve performance outcomes (Fero et al., 2010). Clinical teaching methods allowing students to practice skills and decision making in a "low-risk" environment, rather than at the bedside, may greatly improve knowledge transfer and patient safety. Simulation is such a method.

Anxiety is a frequently articulated problem among nursing students and often affects their ability to transfer classroom learning to clinical practice (Sinclair & Ferguson, 2009). One reason for this anxiety is lecture and group demonstration of nursing skills foster passive learning of important clinical information and the associated critical thinking so vital when providing patient care (Jeffries, 2005). Simulation, an active learning method, had been shown to decrease student anxiety, increase self-confidence and satisfaction, and improve cognitive and psychomotor skills (Vandrey & Whitman, 2001; Alinier, Hunt & Gordon, 2006). Although many nursing educators incorporated simulation into their curricula in hopes of achieving multiple, positive outcomes related to clinical education, few researchers evaluated these outcomes (Alinier et al., 2006).

Another problem nursing educators face today is the ever-increasing limitations related to clinical training sites, such as competition with other health care training programs for student placement and prohibited access to medication dispensing systems. The result is less

opportunities for hands-on clinical experiences. An effective alternative is clinical simulation scenarios which were conducted on campus in nursing skill labs and or simulation labs.

The identification of the problem for research is organized and stated in the form of a PICO statement: P = Patient population, I = Intervention or area of interest, C = Comparison interventions and O = Outcome of interest (Kleinpell, 2009). The PICO statement for this project is as: the population (P) identified was fourth semester nursing students enrolled in the college, Associate Degree program. The intervention/independent variable (I) was clinical simulation using a high-fidelity, cardiovascular learning scenario to determine its effects on nursing education outcome. The comparison intervention (C) was cognitive knowledge level before the simulation experience. The outcomes (O) of the project included nursing students' improvement in cardiovascular knowledge (cognition), increased self-confidence and a positive learning experience expressed as satisfaction. The research question for this study was: Do nursing students' experiences using high-fidelity, cardiovascular simulations have an effect on their overall cognition, self-confidence, and satisfaction in the dealing with patients with cardiovascular issues? The dependent variables under study were knowledge/cognition, self-confidence and satisfaction in learning. The independent variable under study was the cardiovascular simulation.

The purpose of the study was to measure the impact of a cardiovascular simulation laboratory experience on nursing students' satisfaction, self-confidence, and cognitive learning. The use of clinical simulation in nursing education provides many opportunities for students to learn and apply theoretical principles in a safe learning environment. Clinical simulation allows students to gain increased self-confidence in a less stressful simulated clinical setting. The significance of this research was the validation of the positive learning outcomes associated with

the use of high-fidelity simulation in nursing education and the contribution to the nursing literature of supportive data related to the benefits of using high-fidelity clinical simulation as a teaching tool for reinforcing theoretical content.

Theory

Two theoretical frameworks were used to guide the research study: the Nursing Education Simulation Framework devised by Jeffries (2007) and the theory of Self-Efficacy developed by Bandura (1986). The Nursing Simulation Framework has five major components with associated variables. The variables interacting within the framework are the educator, the student, the educational practices, the design characteristics, and the outcomes (Jeffries, 2005). Effective teaching and learning using simulations are dependent on teacher and student interactions, expectations, and roles of each during these experiences (Jeffries, 2005). Successful learning from the use of simulations requires proper simulation design and the appropriate organization of students in the simulation (Jeffries, 2005). The simulations are defined as activities that resemble a real clinical event or environment. The design of simulation may include procedures, decision-making, role playing, and programming of the simulators. Through this framework, it is possible to design a specific simulation to deliver a specific content with specific desired outcomes. The framework of simulation is rarely possible in the hospital clinical setting.

Albert Bandura first described the middle range theory of Self-Efficacy in 1977. According to Bandura, self-efficacy is based on social cognitive theory and conceptualizes person-behavior-environment interaction as “triadic reciprocity” (Bandura, 1986). To determine self-efficacy an individual must have the opportunity for self-evaluation or the ability to compare another person’s performance with evaluative criteria (Smith & Liehr, 2008). Bandura suggests

individual's thoughts about themselves are developed and verified through four different processes: direct experience of the effects produced by their actions, vicarious experience and judgment voiced by others, and knowledge of what they already know by using rules of inference (Bandura, 1986). Also supported by Bandura is the concept that high self-efficacy equates to a higher level of motivation. A review of the literature suggests that high-fidelity simulation enhances learner self-efficacy. This observation combined with Bandura's theory suggests that high self-efficacy beliefs equate to improved performance. Developing pedagogical strategies such as a simulation experience enhances learner self-efficacy and ultimately leads to improved clinical competence (Jeffries, 2005).

Literature Review

Simulation research data for the project was collected through a systematic literature review (SLR) and analyzed using deductive and inductive content analysis for identification of the problem and a possible solution. Simulation experiences resemble reality scenarios in the clinical setting. Simulation is an attempt to reproduce some or nearly all of the essential aspects of a clinical situation so the nursing student would be prepared when a similar situation occurs in the actual clinical setting. Simulation in nursing education occurs along a continuum from low-fidelity to high-fidelity in relation to the degree to which the reality is approached. On the low-fidelity end of the simulation continuum experiences such as using case studies to educate students about patient situations or using role-play to immerse students in a particular clinical situation are used. Farther along the continuum are partial task trainers, such as intravenous cannulation arms or low-technology mannequins that are used to help students practice specific psychomotor skills that are integral to patient care (Jefferies, 2007). High technological and sophisticated simulators are computer-based and the participant relies on a two-dimensional

focused experience to problem solve, perform a skill, and make decisions during the clinical scenario. Finally, full scale, high-fidelity patient simulators are extremely realistic and sophisticated and provide a high level of interactivity and realism for the learner (Jeffries, 2007).

Over the years high-fidelity simulation has been integrated in the healthcare arena (Jefferies, 2007). There were many advantages of high-fidelity simulation in student learning. A simulation experience allows a nursing student to critically analyze their own actions, right or wrong, and reflect on their own skill sets. Students are also given the opportunity to repeat the scenario or simulation task not possible in the acute care setting. The result of a simulation scenario also shows students have decreased anxiety and a heightened sense of self-confidence in their psychomotor skill and critical thinking abilities (Jefferies, 2007). Increased anxiety levels influence decision making, which is directly related to clinical judgment. The fear of making a mistake is the highest anxiety producing situation for nursing students (Rhodes & Curran, 2005). Removing the consequences of clinical errors reduces the anxiety level of the student and improves clinical judgment.

Nursing students often report they lack self-confidence and have an apprehension about performance expectations in the clinical setting (Leigh, 2008). These reported student feelings increase stress and anxiety which leads to decrease cognitive functioning. Developing confidence as a nurse is a major component of clinical decision making. Students benefit from a teaching method that allows them to build upon their self-confidence. Repetition and learning from other students in their performance of clinical skills also leads to increased confidence. High-fidelity simulation is a teaching method that reproduces realistic clinical situations in a protected environment away from patient harm. With this training students not only become more confident, but are safer and more efficient practitioners (Leigh, 2008).

Scenario-driven, problem-based learning using simulation assists students to manage a patient in a confident and competent manner (Guhde, 2010). Simulation also improves students' cognition, association and autonomy (Wotton, Davis, Button & Kelton, 2010). To determine self-efficacy, an individual must have the opportunity for self-evaluation or the ability to compare performance using evaluative criteria (Smith & Liehr, 2008).

Simulation in nursing education is still a relatively new teaching methodology. It has potential as a tool to validate cognitive and reflective thinking skills and competency (Decker, Utterback, Thomas, Mitchell & Sportsman, 2011). Further simulation research is still needed to explore ways to assess critical thinking (Lewis & Ciak, 2011) and add to the body of research-based knowledge in the area of clinical simulation.

Review of Evidence

Review of the evidence was accomplished by conducting a well-built SLR through a rigorous and transparent process. The SLR was a synopsis of original research studies about limited clinical sites for nursing students to train, the causes of the problem, high-fidelity simulation as a solution, and the possible benefits of instituting high-fidelity simulation into nursing education (See Appendix A). The assembly and appraisal of the literature led up to a final and definitive answer to the clinical question relating to the benefits of high-fidelity simulation in nursing education (Houser & Oman, 2011). Multiple databases were used to obtain the research, which included: Academic Search Premiere, Journals @OVID, Goggle Scholar, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The key words ranged from nursing education, high-fidelity simulation, self-efficacy and simulation, simulation pedagogy, to cardiovascular disease. The original SLR consisted of thirty research articles. These research articles were separated by areas of interest in the project and placed in a tool that

facilitated critical appraisal of the research design, level of evidence, study purpose, population sample, methods, primary outcomes, measures, results, conclusions, implications, strengths, and weaknesses.

The evidence obtained from the SLR identified a lack in research examining the cognitive processes that underlie the performance of students in a simulation clinical setting (Hubner, Cormier, and Whyte, 2010). The project provided evidence extending our understanding of how students think when placed in clinical situations and how they used their knowledge to solve problems and make decisions adding to the driving force of this project.

Project Plan and Evaluation

Market Risk Analysis

The project management had two major components: determining what was to be done and establishing how it was to be accomplished (Harris, Roussel, Walters, & Dearman, 2011). The process for assessing the environment for this project evaluated the best strategy for the project in the available environment and situation. A comprehensive needs assessment was developed identifying the strengths, weaknesses, opportunities, and threats (SWOT) analysis (See Appendix B). The strengths identified for the nursing students were content mastery in cardiovascular patient assessment, the ability to reflect on their own nursing skills, and improvement in their self-confidence in both cognitive and psychomotor skills. Strengths identified for nursing education were improving technology-enhanced teaching strategies by current nursing faculty and utilization of the high-fidelity simulators. Weaknesses identified for the nursing student were not taking the simulations seriously, the possibility of nursing students not accurately or honestly completing the demographic questionnaire or the evaluations, possible anxiety related to the simulation, and the videotaping of their performance. A weakness

identified for the nursing faculty was the skill of the faculty performing the simulation to provide a realistic and beneficial teaching intervention. Opportunities identified for the nursing student were to bridge increased cognitive abilities from simulation into practice, support of simulation in nursing education by the National League of Nursing, and support from government agencies that provide grant recipients the opportunity to establish simulation labs. A potential threat was the risk of privacy for nursing students working together in a simulation setting.

A driving force for the need of this research supported the problem identified in the SLR of limited clinical sites for students to learn in the acute care facilities. Many studies documented positive student responses to simulation and some studies revealed improvement in certain aspects of student performance (Hubner, Cormier, & Whyte, 2010). This driving force resulted in the introduction of simulation into nursing education resulting in the preparation of clinically competent registered nurses. Restraining forces identified for this project were training and preparing nursing faculty to incorporate simulation into their curricula. Not all faculty were committed to the time it took to learn simulation, often without reimbursement from employers. Another restraining force was the cost of the simulators and financial support required to maintain the mannequins as documented in the cost benefit analysis as documented in Table 1.

Need, Resources, and Sustainability

The need for simulation in nursing education has been established through the literature review and identified at the college in which this project was completed. The college has been experiencing a reduction of clinical teaching sites mandated by the acute care facility contracted with the school. In addition to the restriction of clinical placements there was a recent restriction on nursing students administering medications, accessing medication dispensing systems, and the medication bar scanning system. These factors resulted in difficulties with the nursing program

meeting learning objectives to adequately prepare the nursing student to become a competent graduate nurse.

The resources were available at this college through their simulation lab which contains two Sim Man®, one Sim Man3G®, and a Sim Baby®. Unfortunately, these simulators were underutilized due to lack of knowledge of the benefit in nursing education and lack of training of the faculty. The underutilization of the simulators was not only a curricular issue but also a resource allocation problem. The results of this project show high-fidelity simulation as an important and desirable aspect of nursing education. These findings not only benefit nursing education, but also influenced nursing faculty to incorporate high-fidelity simulation into their curriculum. The ability for this college to purchase the simulators and the physical space in which they reside was made possible by grant funds awarded by the state.

To achieve sustainability of this project, it requires sufficient advantages in outcomes, consistency with the nursing program values and needs, ease of understanding and implementing findings, benefits outweighed the costs, the ability to adapt, refine, or modify the findings relevant to an identified issue, and validate a need for change (Harris, 2011). The project met all of these elements as evidenced in the body of this written project in the sections identifying the problem recognition, literature review, cost-benefit analysis, data analysis, and project findings and recommendations.

Feasibility, Risks, and Unintended Consequences

Feasibility of the project was achieved by containing costs and utilizing computers and simulators readily available. The nursing students who volunteered for the study were conveniently accessible on campus and given the option for a hospital clinical day or a simulation research day. The choice of a simulation research day was very desirable to the

students due to a later start time for research compared to the start time in the hospital as well as the chance to win an iPod for their participation.

Risk management planning identified the greatest possible risk as the coordination of the computer pretest and posttest before and after the simulation scenario. Both interventions relied on technology to be functioning properly and proficiently by the team. In case a problem did occur the campus information systems technician was informed of the research days and agreed to be available to the team. The team also scheduled an extra day for the research project in case there was a system breakdown in either the computer lab or the simulation lab. Another risk considered was whether the students took the simulation seriously and realistically. Some students had a difficult time talking to the simulator and felt foolish. The lack of reality of the simulators experienced by certain students created some levity which required refocusing the group by the researcher. There was a possible risk of honest and accurate responses when students completed demographic questionnaires and the evaluation forms. Fortunately, for this project there were no unintended consequences identified.

Stakeholders and Project Team

The direct stakeholders were the nursing students who had the most to gain in their education with the opportunity to improve cognitive skills, self-confidence, and experience satisfaction in a teaching experience. Other direct stakeholders were the college and the nursing faculty with new evidence-base practice research to support and initiate teaching pedagogy in the field of simulation in nursing. The new evidence supported the need for introducing simulation into the curriculum and encouraged faculty to incorporate this innovative, technological teaching strategy. Indirect stakeholders were the future patients of these nursing students that will benefit

from their learning experiences in the simulation lab. The students will be more confident in their cognitive skills to make the right decisions in patient care.

The planning of the project was done primarily by the project lead. Assistance was provided by the university Capstone Chair, the on-site doctorate degree mentor, the lab assistant, and a statistical consultant. Support of the project came from all aspects of the nursing program, including the director, dean, faculty, and students, and is aligned with the goals and needs of the program and the nursing students it will impact.

Cost-Benefit Analysis

The cost of the project included the salaries of the team, costs of supplies to conduct the project, the rental fees for the computer lab and the simulation lab in the nursing program's facilities on the college campus. The simulation lab consisted of multiple high-fidelity simulators purchased by the college with the assistance of a California State grant to provide resources to the nursing programs in the State of California located in underserved areas. The simulator used for this project was SimMan®3G, purchased approximately three years ago at the price of \$67,500 (Laredal, 2012). Other simulators in the simulation lab were two SimMan® simulators which were retired by their manufacture, Laerdal, and one older model SimBaby®. The purchase price of the SimMan® was \$37,000 and the older model of the SimBaby® was \$27,000. There are also multiple spare parts and software programs for the models which had an estimated total cost of \$6,500. In addition to the simulators and simulation supplies, there was the physical space of the skills lab which had been designed for an authentic acute care simulation. The simulation room was secured when not in use. In order to implement the project, the cost of acquiring or renting a simulation lab needed to be considered. The cost incurred during this

project was a rental fee determined by the project lead for the use of the simulators, skill lab supplies, and the reservation for use of the simulation lab room.

Table 1

Cost Analysis

Capstone Project Cost Analysis Nursing Students' Experiences Using High-fidelity Cardiovascular Simulation: A Descriptive Study		
<i>Revenue:</i>		
HRSA Traineeship Award		\$1658
2010-2011 Academic Year		\$2030
2011-2012 Academic Year		
Regis University Stipend (Mentor)		<u>\$400</u>
<i>Total Revenue:</i>		\$4088
<i>In-Kind Expenses:</i>		
Project Team		
Mentor		\$3500
Lab Assistant	50hrs	\$70/hr. x \$120
Statistical Consultant		\$570
Researcher	3hrs	\$40/hr. x \$19,125
Facilities Rental		\$95/hr. x
Computer Lab	6hrs	
Simulation Lab		\$45/hr. x \$1500
	425hrs	\$2000
<i>Expenses:</i>		
SPSS Software		\$95
Internet Service		\$440
Color Laser Printer Toner		\$679
Printer Paper		\$46
Copy and Print		\$25
Simulation Lab Supplies		\$35
Text Books		\$750
Office Supplies		\$250
iPod		<u>\$235</u>
<i>Total Expenses:</i>		\$29,370
<i>Net Expense:</i>		\$25,282

The expense of designing and implementing a simulation lab was a large financial commitment. There were available resources and assistance through grant awards depending on

the state in which the nursing program was located and the demographic area; similar to the grant the college received where this project took place. A key factor in analyzing the cost-benefit of starting up a simulation lab was an institutional analysis of the utilization of the lab and determining how simulation would be incorporated into the curriculum. The benefits of this project outweighed the costs of the project by contributing to the evidence-based body of knowledge in nursing education. The evidence showed that simulation in nursing education was an effective teaching strategy in clinical nursing and a valid solution to the limited clinical sites available for nursing students to train.

Project Mission, Vision, Goals, and Objectives

The mission for this project was to demonstrate high-fidelity simulation, a more interactive form of learning, will increase nursing students' knowledge, clinical skills and self-confidence related to cardiovascular nursing care. The vision of this project is to provide evidence-based information demonstrating simulation experiences are a preferred learning strategy when integrated into nursing curricula.

Table 2

Goals and Objectives

Goals	Objectives
Identify a problem for the Capstone Project	1. Perform a systematic review of the literature to identify problem and population needs
Develop an organizational assessment Research theoretical underpinnings that support the project	2. Assess available resources, perform a cost-benefit analysis, and select a research team 3. The theory of Self-Efficacy strongly support the students increased self-confidence following a simulation scenario 4. The Nursing Simulation Framework strongly support the students cognitive improvement through a simulation teaching intervention
Submission of the Internal Review Board (IRB) application	4. All threats and barriers of the project and to the subjects are identified, and the development of the consent form Completion of a human protection course for the safety and privacy of the subjects
Students consent to participate and complete the demographic form	5. The students are given an informed consent verbally and in print The demographic data is analyzed using descriptive statistics of central tendency
Test and analyze cognitive outcomes when implementing a nursing simulation	6. Administer and compare scores for improvement on the pretest and a posttest following the simulation scenario Measurement of improvement in application, analysis, and synthesis of specific knowledge related to cardiovascular disease through test results
Provide the learner with skills that can be transferred into the clinical setting leading to increased self-confidence and improved clinical judgments	7. Analyze the eight question evaluation tool for increased self-confidence that the students completed at the conclusion of the simulation scenario experience
Provide a learner satisfied simulation experience	8. Analyze the five question evaluation tool for increased student satisfaction that the students completed at the conclusion of the simulation scenario experience

Logic Model

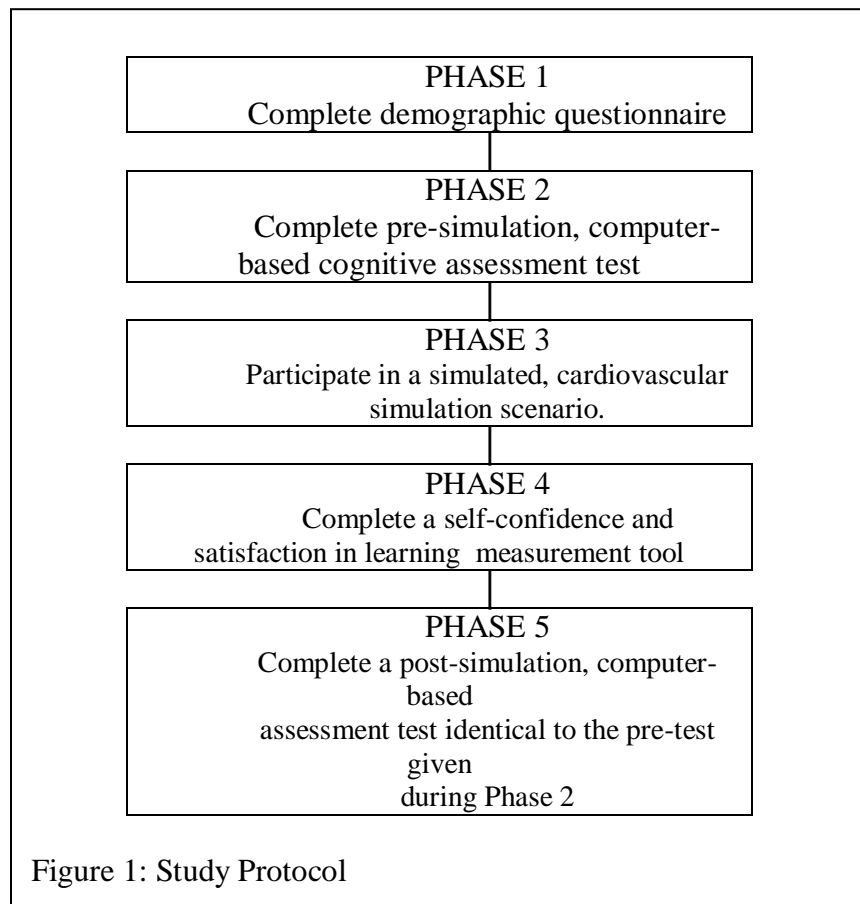
A logic model was developed for the Capstone Project depicting a systematic and visual presentation of the relationships among the resources that were available for the project; the activities that were planned and completed; and the results and changes hoped to be achieved

(Zaccagnini, 2011). The logic model described the entire project plan and indicated how parts of the project were linked together and sequenced (See Appendix C). The resources identified were the location of the project, members of the project team assisting with the project, technological support, and the ability to utilize a computer lab and simulation lab to conduct the project. The activities were planned by selecting the sample, identifying the demographics of the sample, developing the cardiovascular content test to be given before and after the simulation, selecting the evaluation tool and acquiring permission for use, and coordinating the research days. The outputs were the immediate results of the project including the demographics of the sample, the results of the pretest and posttest, and the results of the self-confidence and student satisfaction survey. The outcomes were impact outcomes which resulted in a change in the nursing students' cognitive knowledge of a cardiovascular incident demonstrated by increased assessment skills, communication skills, critical thinking, and technical skills. The outcomes also demonstrated students had increased self-confidence caring for a patient with cardiovascular disease and were satisfied with the simulation scenario. The impact of the project focused on clinical nursing education. The evidence-based data validated simulation as a successful teaching strategy and a partial alternative to an acute care facility clinical training site. This evidence also encouraged nursing faculty to incorporate simulation into nursing curricula.

Population Sampling, Parameters, and Setting

A convenience sample of 61 nursing students enrolled in the final (4th) semester of a two-year, Associate Degree registered nursing program was eligible for inclusion in the study. The settings for the study were the Nursing Simulation Laboratory, one of several skills labs located within the building which houses the Division of Registered Nursing, and the nursing division Computer Laboratory.

All participants were English-speaking, 18 years of age and older and had volunteered to participate. Participants signed a consent form agreeing to participate in the study that included consent for the use of videotaping (See Appendix D). Permission to conduct the study and utilize the Computer and Skills Labs was granted by the college (See Appendix E). Participants were assigned to a particular study group depending on their clinical rotation placement. Each study group consisted of five to six nursing students who completed all phases of the study protocol together. In Phase One, each participant completed a demographic questionnaire. Approximate completion time was 15 minutes. In Phase Two, each participant completed a pre-simulation, computer-based cognitive assessment test designed to measure knowledge related to the care of the cardiovascular patient. Approximate completion time was 45 minutes. Phase Three consisted of participation in a 45 minute simulated, cardiovascular simulation scenario. In Phase Four, participants completed a self-confidence and satisfaction in learning measurement tool. Approximate completion time was 10 minutes. Finally, in Phase Five, participants completed a post-simulation, computer-based assessment test identical to the pre-test given during Phase Two. Figure 1 illustrates the study protocol and its various phases.



Design Methodology and Instrumentation Reliability

The research project was a descriptive study designed to summarize both the subjects' demographics and the relationships between the three variables under study. A pretest and posttest measured changes in knowledge in the cognitive learning domain using a nationally recognized, standardized, external assessment testing product developed by Assessment Technologies Institute (ATI) (Jacobs, 2006). This test was used by the nursing program for all fourth semester level students and measured cardiovascular patient care knowledge. This cardiovascular practice assessment test is frequently administered nationwide to thousands of nursing students on a regular basis (ATI, 2012). ATI is an internet-based, computer testing site

which was easily assessed on the computers in the computer lab using student identification and password protection. The students and researcher received the test scores immediately with detailed information regarding the overall score and scores in particular content areas related to the nursing process. The cardiovascular practice assessment was given as the pretest just prior to the simulation lab session and the same test was administered immediately after the simulation session.

A thirteen-item Student Satisfaction and Self-Confidence in Learning tool was administered following the simulation session (See Appendix F). This tool was developed by the National League for Nursing (NLN), which reported Cronbach's alphas as 0.94 for satisfaction and 0.87 for self-confidence (NLN, 2008). This tool assesses self-confidence (eight questions) and satisfaction (five questions) using a five-point Likert scale with scores ranging from one (strongly disagree) to five (strongly agree). Permission for the use of this tool has been granted by the NLN (See Appendix G).

Data Collection and Treatment Procedure

Participants were issued a subject reference number. Once the demographic data was obtained, participants' responses on all measurement tools remained confidential. Measurement data was coded for analysis. All participant data generated from this study were stored in both original and electronic formats, with password protection, in a locked office. The data from the study will be retained for three years and then shredded.

Protection of Human Subjects

Recognition of the Federal regulations for protection of human subjects was accomplished through the completion of the Collaborative Institution Training Initiative (CITI) for protection of human subjects during clinical research, (CITI, 2010), (See Appendix I).

Federal regulations also required that research involving human subjects be subjected to an institutional review process (IRB). The purpose of this review was to ensure the protection of human subjects vis-a-vis informed consent. Subjects were thoroughly oriented to all phases of the study by the project lead and could withdrawal from the study at any time without penalties to their grades. The review process also ensures that each subject's privacy was provided and that the data collected were secure and used correctly (Zaccagnini, 2011). The review process was conducted by Internal Review Board of Regis University (See Appendix J). Permission to conduct the study at the college was granted by the Director of the Nursing Program and the President of the College (See Appendix E).

Project Findings and Results

Sample Characteristics and Demographics

The fourth semester class of the Registered Nursing program consisted of 72 students. Following informed consent for participation in the project, 61 students consented to participate in the research. These students completed a 25 item demographic questionnaire which was analyzed with descriptive statistics. Six questions were deleted due to poor discrimination values and low response on these items; ethnicity, primary language spoken, multi-lingual, financial status, financial aid, and student learning style.

Frequency distributions were performed on the remaining 19 questions which allowed for the summation of demographic characteristics by grouping participants in various categories. Statistics were calculated using SPSS/PC+ software version 16.0. Descriptive data included gender, age, marital status, number of children living in the home, educational level, employment status, past medical employment, number of hours worked per week, recidivism, current GPA, incidence of clinical remediation, incidence of skills lab referral for skill deficiencies, comfort

level in using a computer, comfort level in taking computer tests, need for testing assistance from the college's Disability Resource Center, experience in clinical simulation, experience in cardiovascular patient care, and previous participation in a research project.

A summary of demographic data showed that the sample consisted of 61 participants of whom 85.2% were female and 14.8% were male. Additionally, 32.8% were 25 and under, 47.5% were ages 26-40, 3.3% were ages 41 to 50, and 16.4% were 51 years of age or older. Marital status showed 54.1% were single, 34.4% were married, 8.2% were divorced, and 3.3% had a domestic partner. Data regarding the number of children living in the home listed 65.6% had no children living with them at the time of the study, 23% had one or two children living at home, 9.8% had three or four children living at home, and 1.6% had more than four children living at home.

With regards to education, 57.4% of participants held a high school diploma, 11.5% had completed an advanced degree prior to attending nursing school and 31.1% had completed an Associate Degree prior to attending nursing school. Students listed their employment status as 45.9% working part-time while attending nursing school, 39.3% did not work, and 14.8% worked full-time while attending nursing school. Additionally, 45.9% of the participants had previous employment experience in a medical field, while 54.1% did not have health care experience. Nearly half of the subjects, 47.5%, stated they worked fewer than 8 hours per week while attending nursing school, 19.7% worked nine to twelve hours, 16.4% worked 25 or more hours, and the remaining participants worked between 12 and 25 hours per week while attending school.

When asked about recidivism, 91.8% of the participants stated that they had not withdrawn from or been readmitted to the nursing program while 8.2% had to repeat some aspect

of the program. Data regarding Grade Point Average showed 18% maintained a GPA of 2.6-3.0, 63.9% of participants maintained a GPA of 3.1-3.5, and 18% had a GPA of 3.6-4.0 at the time of the study. When asked about clinical remediation, 83.6% of participants stated they had not been placed on remediation, 9.8% had been placed on remediation one time, and 6.6% had been placed on remediation two or more times. The majority of participants (78.%) identified that they had never been assigned to the skills lab for clinical remediation while 16.4% had been assigned once for remediation and 4.9% had been assigned 2 times or more.

When asked about comfort with using computers, 83.6% of the participants stated they were very comfortable while 16.4% stated they were somewhat comfortable. As regards to computer testing, 62.3% stated they were very comfortable with computer testing while 32.8% were somewhat comfortable and 4.9% were not very comfortable with computer testing. Of the 61 participants, 96.7% did not require special testing assistance as documented by the college's Disability Resource Center but 3.3% stated they did require testing assistance. Testing assistance consists of extra test-taking time and a controlled testing environment to minimize noise and distractions.

When asked about their experience with simulation as a teaching method, 62.3% of the participants identified that they had previously experienced 1-3 simulations, 9.8% had previously had 4-6 simulation experiences, and 27.9% had never experienced a simulation experience. When asked about their experience in taking care of a cardiovascular (CV) patient, 13.1% of students had previously cared for one to three CV patients, 32.8% had cared for four to six CV patients, 14.8% had cared for seven to nine CV patients and 39.3% had experience in caring for ten or more CV patients.

When asked about their previous experience as a participant in a research project, 91.8% of the participants had no experience while 8.2% had been a subject in a research project. Table 3 summarizes the demographic data.

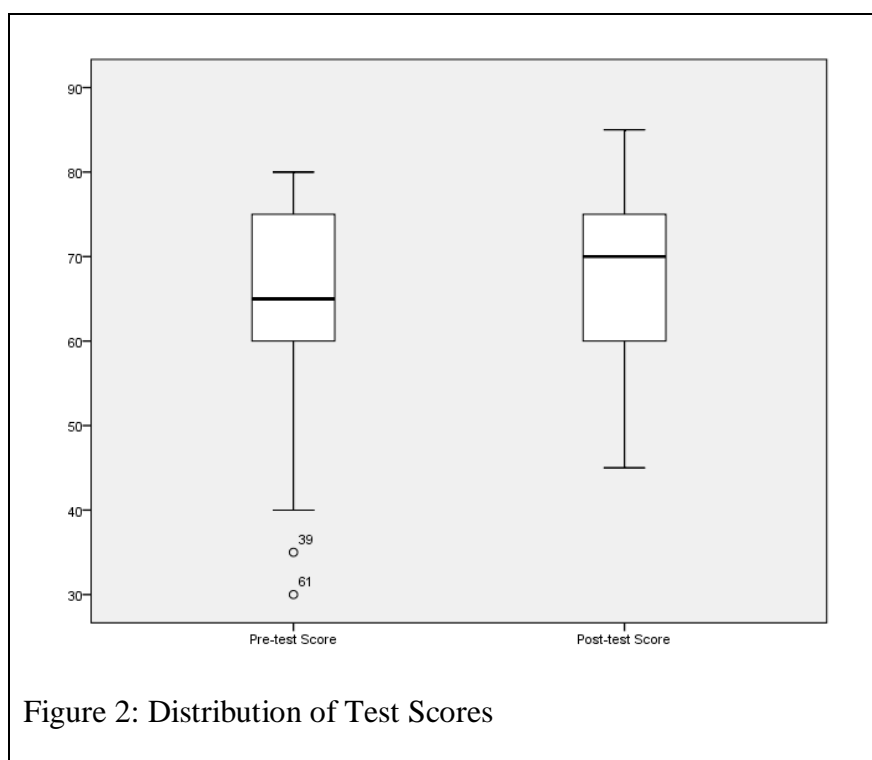
Table 3

Participant Demographics (n = 61)

Variable	Number	% of Total	Variable	Number	% of Total
Gender			Repeat Student		
Male	9	14.80	No	56	91.80
Female	52	85.20	Yes	5	8.20
Age (years)			Current GPA		
25 or under	20	32.80	2.6-3.0	11	18.00
26-40	29	47.50	3.1-3.5	39	63.90
41-50	2	3.30	3.6-4.0	11	18.00
51 and over	10	16.40	Clinical Remediation		
Marital Status			1	6	9.80
Divorced	5	8.20	2 or more	4	6.60
Domestic Partner	2	3.30	None	51	83.60
Married	21	34.40	Skills Lab Referral		
Single	33	54.10	1	10	16.40
Number of Children			2 or more	3	4.90
1-2	14	23.00	None	48	78.70
3-4	6	9.80	Computer Comfort		
>4	1	1.60	Somewhat	10	16.40
None	40	65.60	Very	51	83.60
Education			Comp. Test Comfort		
Assoc Degree	19	31.10	Not Very	3	4.90
Bacc Degree	7	11.50	Somewhat	20	32.80
HS Degree	35	57.40	Very	38	62.30
Employment			Require Test Assist.		
Full-time	9	14.80	No	59	96.70
Part-time	28	45.90	Yes	2	3.30
None	24	39.30	Simulation Experience		
Past Medical Employ			1-3	38	62.30
No	33	54.10	4-6	6	9.80
Yes	28	45.90	None	17	27.90
Current Medical Employ			CV Pt Care Experience		
No	45	73.8	1-3 Pts	8	13.10
Yes	16	26.20	13-24	10	16.40
Work Hrs/Wk			7-9 Pts	9	14.80
<8	29	47.50	10 or more	24	39.30
9-12	12	19.70	Research Participant		
25 or more	10	16.40	Never	56	91.80
			Yes	5	8.20

Distribution of Pretest and Posttest Scores

Figure 2 displays box plots summarizing the distribution of the scores on the pretest and posttest measures. In a box plot, the boxes represent the inter-quartile range (the 25th to 75th percentiles), and the line in the middle of the box represents the median. The whiskers extending beyond the boxes covered the highest and lowest values excluding outliers (defined as more than 1.5 times the interquartile range), and any dots correspond to outliers. The figures showed that the median test score increased between the pre and posttests. In addition, both the minimum and maximum scores increased from one test to the next. Hence, the figure shows how test scores improved.



Paired Sample *t*-tests

A paired-samples *t*-test was conducted to determine if the differences in Figure 1 were statistically significant. With a *p*-value of .008, Table 4 reflects there was a significant difference

in the scores from the pretest to the posttest ($t = -2.77$, $df = 60$, $p = .008$). Thus, there was enough evidence to reject the null hypothesis as posttest scores were significantly higher than pretest scores.

Table 4

Results of the Paired Sample t-test Among Pretest and Posttest Scores

	Paired Differences					<i>t</i>	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pretest Posttest	-3.934	11.110	1.422	-6.780	-1.089	-2.776	60	.008

Means and Standard Deviations Scores

To provide further insight regarding the difference in scores as they relate to some of the demographic, Table 5 reported means and standard deviations for both pretest and posttest scores for the following four variables: age, education, clinical remediation and simulation experience. Looking first at pretest scores, the averages and standard deviations do vary within the age variable categories: 25 or under ($M = 65.50$, $SD = 11.34$), 26-40 ($M = 67.07$, $SD = 9.11$), 41-50 ($M = 50.00$, $SD = 0.00$), 41-55 ($M = 55$, $SD = 17.23$). The statistics for pre/posttest scores and how they relate to education are as follows: advanced degree ($M = 62.63$, $SD = 14.37$), Baccalaureate degree ($M = 59.29$, $SD = 7.32$) and high school diploma ($M = 65.86$, $SD = 11.54$). For clinical remediation experience, the findings are: 1 ($M = 66.67$, $SD = 18.62$), 2+ ($M = 53.75$, $SD = 18.88$), none ($M = 64.61$, $SD = 10.58$). Project simulation experience and pre/posttest scores are as follows: 1 to 3 ($M = 66.05$, $SD = 10.85$), 4 to 6 ($M = 67.50$, $SD = 5.24$) and none ($M = 58.33$, $SD = 15.01$). Finally, the average pretest score was 65 ($SD = 16.83$) for those with

one lab referral, 53.76 (SD = 18.88) for those with two or more lab referrals, and 64.27 (SD = 10.72) for those with no lab referral.

Table 5

Means and Standard Deviations for Pretest and Posttest on Age, Education, Clinical Remediation and Simulation Experience Variables.

Predictor	Pretest Score		Posttest Score	
	M	SD	M	SD
Age				
25 or under	65.50	(11.34)	67.50	(11.18)
26-40	67.07	(9.11)	69.14	(9.17)
41-50	50.00	(0.00)	60.00	(14.14)
41-55	55.50	(17.23)	67.50	(13.18)
Education				
AD	62.63	(14.37)	68.68	(10.39)
Bac	59.29	(7.32)	59.29	(9.32)
HS	65.86	(11.54)	69.43	(10.27)
Clinical Remediation				
1	66.67	(18.62)	70.83	(9.70)
2+	53.75	(18.88)	58.75	(17.50)
None	64.61	(10.58)	68.43	(9.87)
Simulation Experience				
1 to 3	66.05	(10.85)	68.42	(11.22)
4 to 6	67.50	(5.24)	71.67	(7.53)
None	58.53	(15.01)	65.88	(9.88)
Skill Labs Referral				
1	65	(16.83)	70	(11.55)
2	58.33	(20.21)	60	(17.32)
None	64.27	(10.72)	68.13	(9.93)

Table 5 also presents results for posttest scores. Averages and standard deviations do vary within the age variable categories: 25 or under (M = 67.50, SD = 11.18), 26-40 (M = 69.14, SD =

9.17), 41-50 ($M = 60.00$, $SD = 14.14$), 41-55 ($M = 67.5$, $SD = 13.18$). Means and standard deviations related to education statistics are as follows: advanced degree ($M = 68.68$, $SD = 10.39$), Baccalaureate degree ($M = 59.29$, $SD = 9.32$) and high school diploma ($M = 69.43$, $SD = 10.27$). For clinical remediation experience, the findings are: 1 ($M = 70.83$, $SD = 9.70$), 2+ ($M = 58.75$, $SD = 17.50$), none ($M = 68.43$, $SD = 9.87$). Project simulation experience and pre/posttest scores are as follows: 1 to 3 ($M = 68.42$, $SD = 11.22$), 4 to 6 ($M = 71.67$, $SD = 7.53$) and none ($M = 65.88$, $SD = 9.88$). Finally, the average posttest score was 70 ($SD = 11.55$) for those with one lab referral, 60 ($SD = 17.32$) for those with two or more lab referrals, and 68.13 ($SD = 9.93$) for those with no lab referral.

Self Confidence and Learner Satisfaction

Table 6

Internal Reliability (Cronbach's Alpha) for Self-Confidence and Satisfaction.

Predictor	No. of Items	α
Self-Confidence	8	0.754
Satisfaction	5	0.925

Because self-confidence and satisfaction were both measured using multi-item constructs, Cronbach's alpha was utilized to measure each scale's reliability. As Table 6 illustrates, both self-confidence ($\alpha = 0.754$) and satisfaction ($\alpha = 0.925$) carry a high alpha. This indicates that the items had relatively high internal consistency and was consistent with previous studies.

The study also included measures on satisfaction and self-confidence. Table 7 displayed summary statistics for each of these scales, which were created by taking the mean of the constituent items. For the self-confidence scale, the minimum score was 1.8 while the maximum

was 5. The average was 4.62 (SD = .60), which means that the average response was high on the scale. For the satisfaction scale, the minimum score was 3.63 while the maximum was 5. As was the case for the self-confidence scores, the average response was at the high end of the scale. The mean was 4.44, with a standard deviation of 0.42.

Table 7

Descriptive Statistics for Self-Confidence and Satisfaction Scales.

	Min	Max	Mean	SD
Self-confidence	1.8	5.0	4.62	.60
Satisfaction	3.63	5	4.44	.42

Table 8 breaks down the scores by age group. The average response on the satisfaction scale for those in the 25 and under group was 4.65, 4.7 (SD = .43) for the 26-40 group; the two subjects in the 41-50 group both scored at the scale maximum; and those in the 41-55 group had the lowest average statistical response at 4.26 (SD = 1.02). Turning to the self-confidence scale, the average score was 4.45 (SD = .41) for the youngest group, 4.51 (SD = .43) for the 26-40 group, 4.31 (SD = .09) for the 41-50 group, and 4.27 (SD = .44) for the oldest group.

Table 8

Means and Standard Deviations for Satisfaction on Age.

Predictor	N	<u>Satisfaction</u>		<u>Self-Confidence</u>	
		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Age					
25 or under	20	4.65	(0.51)	4.45	(0.41)
26-40	29	4.70	(0.43)	4.51	(0.43)
41-50	2	5.00	(0.00)	4.31	(0.09)
41-55	10	4.26	(1.02)	4.27	(.44)

Based on the findings, the above analysis supported that test scores improved significantly due to participation in the simulation. In addition, average scores on the satisfaction and self-confidence scales were quite high. Simulation used as a teaching strategy for clinical nursing education does improve cognitive knowledge, self-confidence in caring for a patient with cardiovascular disease, and increased student satisfaction levels using this simulation instructional method. This project has answered the evidence-based practice question: Do nursing students' experiences using high-fidelity, cardiovascular simulations have an effect on their overall cognition, self-confidence, and satisfaction? The answer in this capstone project was yes.

The validity of the project was accomplished through the appropriate use of scientifically sound methodology. As such, the independent and dependent variables were clearly defined and the project was free from bias. The reliability of the study was based on the statistical data analysis of the demographic questionnaire, the ATI cardiovascular pretest and posttest, and the NLN evaluation tool (reliability of these tools has been previously discussed in this document). The questions or items on each of these tools measured the same characteristics with all the subjects and does so consistently. The sample size was small and extremely homogenous. All the

subjects were in the fourth semester and had received the same content in theory and clinical in their nursing education. Consistency was accomplished in the delivery of the research by the researcher administering the simulation scenario to all the groups over a two day period. The computer testing was supervised by the capstone mentor for the entire sample.

Limitations

Generalizability was limited due to the small sample size. Another limitation which occurred at times during the simulation sessions was the momentary distraction of levity caused by one or two students who would not take the simulator seriously. This interruption required the project lead to refocus the group and continue or restart the scenario. In retrospect, the investigator should have forewarned the participants of the negative effects of such behavior on the learners and the project process. Because cognitive assessments were based on a simulated scenario, a possible limitation of the study was that assessment data might differ when students encounter real-life patients with cardiovascular problems. Also, for those students who had limited to no simulation experience, anxiety might have influenced their cognitive performances.

Recommendations

Simulation-based cognitive assessment tools and literature related to the nursing population was limited. The literature lacked evidence which encompassing the full use of simulation evaluation (Fero et al., 2010). Thus, one recommendation is for nursing programs to obtain or utilize existing simulation labs and mannequins of all levels of fidelity. Nursing programs need to move from the random use of simulation by faculty to consistent usage of all levels of simulation as part of an integrated curriculum. This recommendation will require the logistics of incorporating simulation, its financial commitment and feasibility, and continued faculty development to successfully operate and design simulation scenarios. Many nursing faculty

know of simulation but only a few had used it (Starkweather & Kardong-Edgren, 2008). This fact requires faculty education on simulation and presentation of evidence-based practice research such as this project to influence interest in learning and adopting simulation into their curriculum.

Recommendations for further research would be to evaluate performance of nursing student graduates on NCLEX pass rates, clinical practice success, and reduction error rates related to the utilization of simulation in nursing education. Research in this area would further the body of knowledge as to the benefits of simulation in nursing education as well as nursing practice.

Implications for Change

The limited clinical sites for nursing education and the advancement of technology are the implications for change in nursing education by implementing simulation. These situations placed pressure on nursing programs to adopt simulation to meet the clinical objectives of their nursing students. The introduction of high-fidelity simulation in nursing education provides a solution for clinical education outside of the acute care facility. This study and other current research show simulators to be an appropriate, innovative, beneficial, and a sound technological teaching strategy.

The results of this study contribute to nursing educators' understanding of the learning processes associated with the use of high-fidelity simulation. It is recommended that further research be conducted in both the innovative use of simulation in nursing education and also the application of metrics to simulation learning outcomes. This will assist nursing educators and administrators to determine the best, most cost effective methods of evaluating and preparing nursing students for competent, safe clinical practice.

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Appendix A

Systematic Review Evidence Table Format adapted with permission from Thompson, C (2011). Sample evidence table format for a systematic review. In J. Houser & K.S. Oman (Eds.), *Evidence-based practice: An implementation guide for healthcare organizations* (p. 155). Sudbury, MA: Jones and Bartlett.

Articles 1-7

Article Title and Journal	High-Fidelity Simulation: Factors Correlated with Nursing Student Satisfaction and Self-Confidence <i>Nursing Education Perspectives</i>	Student Satisfaction with High-Fidelity Simulation: Does it Correlate with Learning Styles? <i>Nursing Education Perspectives</i>	Use of the Human Patient Simulator to Teach Clinical Judgment Skills in a Baccalaureate Nursing Program <i>CIN: Computers, Informatics, Nursing</i>	The Development of a Quantitative Evaluation Tool for Simulations in Nursing Education <i>International Journal of Nursing Education and Scholarship</i>	Managing the Deteriorating Patient in a Simulated Environment: Nursing Students' Knowledge, Skill and Situation Awareness <i>JCN: Journal of Clinical Nursing</i>	An Exploration of the Relationship Between Knowledge and Performance-Related Variables in High-Fidelity Simulation <i>Nursing Education Perspectives</i>	High Fidelity Simulation: Consideration for Effective Learning <i>Nursing Education Perspectives</i>
Author/Year	Sherrill J. Smith Carol J. Roehrs 2009	Rebecca A. Fountain Danita Alfred 2009	Mattie L Rhodes Cynthia Curran 2005	Martha Todd Julie A. Manz Kim S. Hawkins Mary E. Parsons Maribeth Hercinger 2008	Simon Cooper Leigh Kinsman Penny Buykx Tracy McConnell-Henry Ruth Endacott Julie Scholes 2010	Roxanne P. Hauber Eileen Cormier James Whyte VI 2010	Bernard Garrett Maura MacPhee Cathryn Jackson 2010
Database and Keywords	Academic Search Premiere Nursing Student/HFS	Academic Search Premiere Nursing Student/HFS	Journals@OVID Searched for this Article	CINAHL Nursing Education/Simulation	CINAHL Nursing Education/Simulation	Publication I receive, Nursing Perspectives	Publication I receive, Nursing Perspectives
Research Design	Researcher-designed demographic instrument used to describe the sample and assess the	Students attended a lecture on ACS and then were provided 5 case studies followed by lab (HFS)	13 item survey developed by the faculty with student demographics	Faculty developed an evaluation tool testing the AACN core competencies. 7 experienced	Quantitative measure of demographics, knowledge, skill performance (SP) and	Quasi-experiment design Cognitions and performance-related variables	Digital recordings and student feedback initiated changes to plan

	possible correlation of demographic characteristic to student satisfaction and self-confidence/self report Instrument used a 5-point Likert scales	activity Students then completed the Student Satisfaction and Self-Confidence questionnaire this instrument was correlated to an entrance exam that tested learner type	Survey is performed by the student reflecting if the simulation was a positive experience and was beneficial The questionnaire questions were submitted and a summary of responses was performed	simulation educators tested content validity by having the faculty rate individual behaviors identified on the instrument using a Likert scale: were behaviors necessary to be included, are they reflective of the specific section, and are the behaviors easy to understand	situation awareness (SA) via questionnaires 51 students attended the 5 hr. individual session that included preliminary data collection, 2 simulation exercises and video-based reflective review and feedback	were measured in order to offer the most complete picture of participant performance Knowledge base of participants were determined by using common knowledge-related measure, including grades form previously completed nursing coursed and scores on standardized tests	and develop considerations for effective learning with HFS
4 Tiered Levels of Evidence	Level III	Level III	Level (N/A)	Level III	Level IIa	Level IIb	Level (N/A)
Study Aim/Purpose	Investigate if there is a correlation of the outcomes, student satisfaction and self-confidence	To explore how learning styles correlate with student satisfaction when HFS is used over 3 campuses	Solution to the dilemma of preparing nursing students with limited clinical placements to enhance knowledge, facilitate skill acquisition, to decrease anxiety, and to promote clinical judgment	To develop and evaluate a quantitative instrument to assess student performance during simulated clinical experiences using the AACN core competencies	To assess final-year nursing students ability to asses and manage patient deterioration and to measure the relationships between knowledge, situation awareness (SA), and skill	Determine the relationship between common measure of knowledge and performance-related variables measured using HFS	A student/ Faculty collaboration to explore the evidence-based learning approaches in nursing education simulation

					performance (SP)		
Population Studied/ Sample Size/Criteria/Power	68 BSN Students Junior level	Convenience Sample of 104 BSN Students	Senior level student unknown how many	Evaluation tool was studied using 72 students divided into groups of 4 or 5, and 7 faculty members to evaluate it	51 final year nursing students	15 randomly selected 3 rd semester nursing students	30 senior students and 8 faculty
Methods/ Study Appraisal/ Synthesis Methods	Descriptive, Correlation Design All errors were corrected prior to analyzing data using SPSS. Descriptive statistics were first employed to answer each question, followed by appropriate statistical analysis	Descriptive statistics, tests of means, and correlations Percentile scores were measured for 6 learning styles Data was analyzed using Pearson product- moment correlation	Development of simulation tool. Role of faculty outlined, simulation objectives listed	Descriptive statistics-validity questionnaire on the AACN core competencies was the <i>Necessity</i> mean/SD, <i>Fittingness</i> Mean/SD, <i>Understanding</i> Mean/SD For the overall evaluation of the instrument only the mean and SD was used.	Demographic profile used the mean and SD for age, gender, having additional clinical placements, variable of students who had taken critical care or ER clinical placements (previous experience) The mean and CI was measured for the multiple choice questionnaire of knowledge The percentage, mean, CI were measured for the correct performance observations in the simulations	Data analyzed using SPSS Demographic data using descriptive stats Bivariate correlations were performed to determine the nature of the relationship between the common physiologic variable as a reflection of performance and grades/scores on standardized tests as measures of knowledge mean/SD/t statistic were used	Development of an effective learning tool for HFS

<p>Primary Outcome Measures and Results</p>	<p>Statistical data was provided on all 5 questions</p> <p>The statistical data relative to the 2 outcomes was significance at 0.01</p> <p>The lowest correlation 0.430 and the highest 0.614</p>	<p>Learning styles were significantly correlated with satisfaction and social learning $r=.29$, $p=.01$ and with solitary learning $r= .23$, $p=.04$</p> <p>Slight difference among the 3 campuses. $F= 2.7$; $df2.75$; $p=.071$</p>	<p>Through student evaluations and faculty observations results of outcomes accomplished were described</p> <p>No statistical data published or described</p>	<p>The panel agreed on Content Validity Questionnaire</p> <p>Results that each behavior should be included in the Simulation Eval Instrument (M=3.84, SD=0.12) next reflected the corresponding category, (M=3.85, SD=0.12) and finally each behavior was easy to understand (M=3.82, SD=0.23). Expert panel evaluation was overwhelmingly positive (m=3.83, SD=0.10) that the instrument could evaluate student learning</p>	<p>Mean 29.6, SD 10.1 for age, previous experience mean 4.7, SD 1.2. 94.1% women, 60.8% experience in CC or ER</p> <p>Multiple choice knowledge questionnaires 45-100%, SD 10.6; 95% CI: 56.5-62.5.</p> <p>The 2 scenarios were statistically evaluated separately and by observation and action (lots of statistical data)</p>	<p>The statistical data was based on grades and performance separating students with high and low performance</p>	<p>Used health care literature to demonstrate advantages to HFS, especially its ability to offer a safe environment for improving competencies</p>
<p>Author Conclusions/ Implications of Key Findings</p>	<p>There were no strong correlations between outcomes of satisfaction and self-confidence</p> <p>Implications: In designing an HFS experience clear objectives and a problem to</p>	<p>It is possible to engage multiple learning styles with one learning activity</p>	<p>A Simulation tool enhances critical thinking</p> <p>Active participation by students is an enjoyable experience in learning, less</p>	<p>The development of a valid and reliable instrument for simulation evaluation is possible with positive implications</p>	<p>Knowledge scores suggest, on average, a satisfactory academic prep, but this study identified significant deficits in students' ability</p>	<p>There was a significant and direct correlation with the Adult Health but indirect correlation with the Fundamentals</p>	<p>The authors' school of nursing has established a set of evidence-based HFS learning components associated with positive</p>

	<p>solve is imperative also addressing workloads of faculty to design and implement simulation experiences</p>		<p>anxiety than live patients, builds confidence</p> <p>Planning and designing the project requires the work and time of a small team of faculty</p> <p>Future work needed to measure knowledge using the simulator vs. didactic teaching</p>	<p>Reliable instrument for simulation minimizes a subjective evaluation by providing an objective quantitative score</p>	<p>to manage patient deterioration</p> <p>Nursing students at the time of this evaluation may be inadequately prepared to manage a deteriorating patient in the clinical setting</p>	<p>and other courses</p>	<p>outcomes for students and faculty</p>
<p>Strengths/ Limitations</p>	<p>Strengths – Method used also determined the satisfaction of the experience to the design characteristic of the HFS Limitations – Results of test could vary according to quality of design characteristic</p>	<p>Strengths – Method used to correlate learning styles with satisfaction was validated by using more than 1 University Limitations – None noted</p>	<p>Strengths – Related to my simulation development for time management planning of a simulation Limitations – Lack of statistical data. Need to know the sample size and could have done statistical studies on the results of the student surveys to give this useful article a higher rating for a higher level of evidence</p>	<p>Strengths – Faculty evaluators had varied backgrounds and all had presented or attended at national and international conferences on the topic of simulation Limitations – a small sample size with only 1 location, only 2 scenarios used</p>	<p>Strengths – Tested multiple aspects to simulation separately, including demographics Also had 2 scenarios with separate content, hypovolemia and septic shock Limitations – Small sample size, 1 university</p>	<p>Strengths – the focus on previous academic work (cognitive) Limitations – Did not like the way the data was set up. It was difficult to distinguish where the simulation scenarios and cognitive measures were. It appears all cognitive by the variables listed</p>	<p>Strengths – Students and faculty collaboration For the development of the tool Limitations – Narrative results no numerical data to verify experience</p>
<p>Funding Source</p>	<p>University of the</p>	<p>University of the</p>	<p>University of the</p>	<p>University of the</p>	<p>The Nurses Board of Victoria Major Research</p>	<p>University of</p>	<p>University of</p>

	HFS lab	HFS lab	HFS lab	HFS lab	Grant	the HFS lab	the HFS lab
Comments	<p>The use of the NLN instrument to measure self-confidence may be useful to me for my Capstone Project</p> <p>Also the framework for the study, Nursing Education Simulation Framework</p>	<p>Utilizing learning styles enhances the potential for student success I'm considering a self-evaluation by the student or a computer test by ATI as to their learning styles</p>	<p>This article developed a simulation scenario time frame that will be very useful in planning my simulation</p>	<p>Especially helpful in specially listing the behaviors for the students to accomplish and evaluated under each AACN core competency</p> <p>Will use this in my simulation development</p>	<p>SA is explained and is a focus in this research. SA has 3 levels – perception, understanding, and prediction.</p> <p>Perfect for my Capstone – Nursing students identification and management of patients at risk for heart disease with HFS</p>	<p>This research has identified another aspect that could be introduced in my project and that is previous work (grades, ATI testing) of the students in the study</p> <p>Also another theory that I am not familiar with, EPA-Expert-Performance-Approach</p>	<p>Stress the importance and lack of HFS to be able to assess non-technical skills</p> <p>I will also be incorporating non-technical skills to identifying the patient at risk for HD</p>

Articles 8-14

Article Title and Journal	Third-Year Undergraduate Nursing Students' Perceptions of HFS <i>Journal of Nursing Education</i>	Integrating Simulation Teaching/Learning Strategies in Undergraduate Nursing Education <i>International</i> <i>Journal of Nursing Education Scholarship</i>	Outcomes of Clinical Simulation for Novice Nursing Students: Communication, Confidence, Clinical Judgment <i>Nursing Education Perspectives</i>	Developing a Valid and Reliable Self-Efficacy in Clinical Performance Scale <i>International Nursing Review</i>	High-Fidelity Nursing Simulation: Impact on Student Self-Confidence and Clinical Competence <i>Journal of Nursing Education Scholarship</i>	High-fidelity Patient Simulation and Nursing Students' Self-Efficacy: a Review of the Literature <i>Journal of Nursing Education Scholarship</i>	The Impact of clinical simulation on Learner Self-Efficacy in Pre-Registration Nursing <i>Nurse Education Today</i>
Author/Year	Karen Wotton Jordana Davis Didy Button Moira Kelton 2010	Barbara Sinclair Karen Ferguson 2009	Deborah Bambini Joy Washburn Ronald Perkins 2009	F. Cheraghi, P. Hassani, F. Yaghmael, H. Alvi-Majed 2009	Cynthia Blum Susan Borglund Dax Parcells 2010	Gwen Leigh 2008	Tamsin Pike Victoria O'Donnell 2010
Database and Keywords	CINAHL Self-Efficacy/ Simulation	CINAHL Self-Efficacy/ Simulation	CINAHL Self-Efficacy/ Simulation	CINAHL Self-Efficacy/ Simulation	CINAHL Self-Efficacy/ Simulation	CINHAL Self-Efficacy/ Nursing Education	CINHAL Self-Efficacy/ Nursing Education
Research Design	Evaluative cohort study Evaluation was achieved through a form using the 5pt Likert Scale and 3 open ended questions	Convenience sample. Students completed a demographic questionnaire and a nursing student teaching-learning self-efficacy questionnaire that was developed using the 5pt Likert Scale	Integrated, quasi-experimental, repeated-measures design Convenience sample using 3 surveys developed by the researchers, each consisted of 6 questions using a 10-point scale	A self-efficacy in clinical with well-developed theoretical constructs was formed and evaluated by 20 nursing experts for content validity The tool used a 4pt rating scale	Student participated demographics Quasi-experimental Quantitative study Students were enrolled in 1 to 3 hrs. of instruction and practice Control group demonstrated skill competency using the	Literature Review Electronic databases CINHAL, PubMed, MEDLINE, ProQuest, EBSCOhost Relevant nursing research with articles published primarily within the past decade based on	Qualitative analysis of pre and posttest question that measure learner self-efficacy before and after a clinical simulation session

					traditional approach of task trainers and student volunteers Experiment group demonstrated skill competency using Laerdal's SimMan Measurement of self-confidence and clinical confidence by a Lasater rubric and Likert scale	empirical studies	
4 Tiered Level of Evidence	Level IIa	Level III	Level IIb	Level IIa	Level IIb	Level IV	Level III
Study Aim/Purpose	To explore the perceptions of 3 rd year nursing students of their experiences with 3 HFS scenarios	To explore the effect of transition from lecture to clinical and students' perceptions of self-efficacy, satisfaction, and effectiveness	Evaluate simulated clinical experiences as a teaching/learning method to increase the self-efficacy of nursing students during their initial clinical course in a four-year BSN program	To clarify the concept of self-efficacy in clinical performance To develop a valid tool to evaluate nursing students' self-efficacy in clinical performance	To detect differences in entry-level student confidence and clinical competence based on laboratory enrollment	Developing self-confidence as a nurse	To do a qualitative approach to add to the current body of quantitative literature To gain insight from the learners perspective
Population Studied/ Sample Size/Criteria/ Power	300 nursing students in study Sample size n=297 for scenario 1, n=271 for scenario 2,	250 2 nd year nursing students The nursing school is at 2 sites Site 1 served as an intervention group	Moderate effect size of 0.5 needs, indicating that 64 students would be required to achieve a power of 0.80	207 nursing students	53 entry-level BSN junior year nursing students	87 articles and references reviewed	Convenience sample of 22 undergraduate nursing students

	n=250 for scenario 3	n=125 and site 2 served as the control group n=125	Took place over 4 semesters with a sample of 112 students				
Methods/ Study Appraisal/ Synthesis Methods	Data analyzed using SPSS Krueger's framework analysis was used to analyze qualitative data generated by the 3 open ended questions	Self-efficacy questionnaires were analyzed using paired t-tests and mean differences The reflective review was analyzed for themes	Pre and posttest surveys - t-test analysis was used to compare the means of the pretest and posttest summative scores to determine if there was a significant change in student self-efficacy after participation in the simulation Individual items from returned surveys – Wilcoxon matched pairs single-ranks to detect changes in self-efficacy Open ended questions individually reviewed and compared to specific concepts	Through purposive sampling volunteer participants were select from 4 th year nursing students in 3 universities Interviews were conducted estimated 20 to 30 minutes Content analysis of the interviews transcripts were conducted to identify key items to be included in the self- efficacy instrument Psychometric testing was performed on the instrument for validity and reliability	SPSS Version 17 an alpha level of .05 marked statistical significance Cross tabulations, Pearson's correlations, Cronbach's alpha, and paired sample t-tests were used to examine associations and ratings of student and faculty of self-confidence and clinical competence A Clinical Judgment Model and Lasater rubric for measurement of self-confidence and clinical competence	Summarizes the literature for supportive evidence for increased student self-efficacy with the use of HFS	3 question questionnaire for - self-efficacy beliefs -value of vicarious experiences -influence of the educator/mentor and teaching and learning methods
Primary Outcome Measures and Results	Qualitative findings are reported with the Quantitative data The Likert	The most commonly valued aspects of simulated learning activities	Survey 1 – Pre and Posttest t test analysis $m=28.6/SD=7.718$ Posttest	SPSS 16 software used Demographic statistics Internal	The 4 Lasater items used to define student self-confidence, measured with	Multiple conclusions were referenced from research articles and authors	Thematic content analysis Both researchers carried out the

	<p>results are listed as m=% of students who strongly agree to don't agree</p>	<p>described were peer learning opportunities, reinforcement of knowledge, and improved confidence</p> <p>Greater levels of confidence</p>	<p>$m=42.1/SD\ 7.45$ $t\ -20.875, p<0.01$</p> <p>Survey 2 – mean ranks on 6 variables</p> <p>Survey 3 – Qualitative responses summarized</p>	<p>reliability had alpha=0.96; the dimensions</p> <p>Cronbach's alpha ranged from 0.90 to 0.92</p> <p>Concurrent validity was obtained $r=0.73, P=0.01$</p>	<p>Cronbach's alpha was .810. Students midterm and final self-confidence ratings correlated positively $r=.483, p=.001$ and were significantly different $t=5.100, df=52, p=.001$</p> <p>Cross-tabulations for the overall sample revealed 27 students rated their self-confidence in the exemplary range at the final assessment compared to 16</p>		<p>analysis independently initially and then met together which allowed triangulation of analysis and increased confidence in the findings</p>
<p>Author Conclusions/ Implications of Key Findings</p>	<p>Students strongly agreed or agreed to the positive aspects of the simulation scenarios with very little difference between the 3</p> <p>Almost ½ felt lost at times When simulation is incorporated into curriculum it can become a</p>	<p>Findings of this study is an educational intervention of either lecture or a combination of lecture/simulated learning activities leads to perceptions of increased self-efficacy</p>	<p>Survey 1 – revealed a significant increase in student confidence in after the simulation</p> <p>Survey 2 – age, previous work did not affect confidence but students did experience increase in</p>	<p>Development of a practical, 37-item students' self-efficacy in clinical performance (SECP) instrument The tool demonstrated evidence of internal consistency reliability, content validity, construct</p>	<p>Results indicated student self-confidence increased regardless of traditional or simulation laboratory enrolment</p> <p>The Clinical Judgment Model was validated</p> <p>The Lasater rubric indicated a</p>	<p>There is sufficient and extensive supportive data to support the use of HFS increases self-efficacy</p>	<p>Communication skills rated low in self-efficacy</p> <p>There was also mixed results from authenticity of experience</p> <p>Some students could not get past the manikin not being real.</p>

	powerful bridge between theory and practice		confidence Survey 3 – Three themes identified, communication, confidence, and clinical judgment, students comments reflected the experience related to all 3	validity, and concurrent validity	developmental trend evidenced by the shift from ‘beginning’ and developing ranges of self-confidence and clinical competence to ‘accomplished’ and ‘exemplary’ ranges		
Strengths/ Limitations	Strengths – the adequate sample size and the use of 3 simulation scenarios Limitations – None noted	Strengths – Dividing the groups into control and intervention Limitations – Low response rate to questionnaires 23-75% for the control group and 26-68% for the intervention group	Strengths – multiple surveys using both quantitative and qualitative research Limitations – Reliance of self-report and also a poor response to the follow up survey	Strengths – The evidence of validity was well documented Limitations – Small sample size	Strengths – The use of 2 measurement tools Limitations - There was not significant differences in the demographics of the sample and small sample subgroups	Strengths – Extensive review by the authorities on the subjects of HFS and self-efficacy Limitations – None noted	Strengths – Suggestions for pedagogical approaches were discussed Limitations – Small sample size and convenience sampling Random sampling would be a better choice but not logical You cannot force a student to participate unless it is part of the curriculum
Funding Source	University of the HFS lab	University of HFS lab	University of HFS lab	Unknown/part of a PhD dissertation	University of HFS lab	University of Louisiana	University of HFS
Comments	The questions on the Likert 5pt evaluation would be useful in my	The conceptual framework I will be using is self-efficacy, this is an	The use of multiple instruments in the research article	Although this did not involve simulation it had a very strong	I am reviewing a repeating theme in my systematic review which is	The valuable aspect of this article was the reference list	A new thought to research for qualitative studies

	<p>project</p> <p>I will need to include an overall evaluation of the students experience</p>	<p>excellent example demonstrating theory into the research</p>	<p>Spoke with my mentor on the possibility of doing this as well</p> <p>Interested in researching the theory as well as HD in simulation</p>	<p>research focus on Self-Efficacy</p> <p>References lead me to additional readings</p>	<p>some type of prep for the students for the simulation</p> <p>This research had 1 to 3 hr. prep. I will need to design this as well</p>	<p>I am researching the author Lasater as this person has been mention in the past 2 articles and may be interested in using their assessment tool</p>	<p>I plan to have both quantitative research and qualitative</p> <p>My qualitative portion will focus on the students' experiences in the simulation</p>
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Articles 15-21

Article Title and Journal	Validity of the Visual Analogue Scale as an Instrument to Measure Self-Efficacy in Resuscitation Skills <i>Medical Education</i>	Overweight, Obesity, and Incident Asthma A meta-analysis of Prospective Epidemiologic Studies <i>American Journal of Respiratory and Critical Care Medicine</i>	The Commission on the Social Determinants of Health: Reinventing Health Promotion for the 20 th Century <i>Critical Public Health</i>	Global and Regional Burden of Disease and Risk Factors, 2001: Systematic Analysis of Population Health Data www.thelancet.com	On Being Responsible: Ethical Issues in Appeals to Personal Responsibility in Health Campaigns <i>Journal of Health Communication</i>	Health Promotion by Social Cognitive Means <i>Health Education and Behavior</i>	Knowledge, Preventive Action, and Barriers to Cardiovascular Disease Prevention by Race and Ethnicity in Women: An AHS National Survey <i>Journal of Women's Health</i>
Author/Year	Nigel M. Turner Anita J van de Leemput Jos M.T. Draaisma Paul Oosterveld OlleTh J ten Cate 2008	David A. Deuther E. Rand Sutherland 2007	Fran Baum 2008	Alan Lopez Colin Mathers Majid Ezzati Dean Jamison Christopher Murray 2006	Nurit Guttman William Harris Ressler 2001	Albert Bandura 2004	Heidi Mochari-Greenberger Thomas Mills Susan L. Simpson Lori Mosca 2010
Database and Keywords	CINHAL Self-Efficacy Nursing Education	Academic Search Premier Epidemiology Wk5 reading	Academic Search Premier Epidemiology Wk5 reading	Academic Search Premier Epidemiology Wk5 reading	Google Scholar Personal Responsibility In Health	Google Scholar Health Promotion	Academic Search Premier Education Level Heart Disease
Research Design	The development of the VAS was tested for validity by comparison to a questionnaire for each number of separate tasks Testing was done for face validity and internal	Systematic search according to recommendations of the Meta-analysis of Observational Studies in Epidemiology group	Describes the work of the Commission on Social Determinants of Health established by the WHO It is not new research but a	The 10 leading diseases for global disease burden were identified between 1990 and 2001 These were totaled and analyzed by	Discussion of personal responsibility for health Three major facets of responsibility are identified with ethical concerns and questions for	Review of statistical information to apply theory to a multifaceted casual structure in which self-efficacy beliefs operate together with goals, outcome	25yrs or older were interviewed via digit dialing and asked to complete a survey to evaluate knowledge, preventive actions taken in the past year, and

	consistency Assessment of construct validity was accomplished using a multi-trait, multi-method (MTMM) matrix of the correlations between self-efficacy for the various tasks as measured using the VAS and the questionnaire	Targeted studies were those in which the relationship between BMI and incident asthma was evaluated MEDLINE, Cumulative Index to Nursing and Allied Health Lit, International Pharmaceutical Abstracts, and all Evidence-Based Medicine Reviews were searched between 1966-2006	paper summarizing these works	separating them into low-med income countries and high income countries Included were a range of data sources, disease registers, epidemiological studies, health surveys, and health facility data to estimate incidence, health state prevalence, severity durations, and mortality for 136 disease and injury cause categories	each facet	expectations, and perceived environmental challenges Motivation, behavior and well-being are addressed	barriers to CVD prevention All respondents were given an interviewer-assisted questionnaire to collect standardized demographic and personal health information
4 Tiered Levels of Evidence	Level III	Level Ia	Level IV	Level III	Level IV	Level IV	Level III
Study/Aim/Purpose	Assess the validity of a visual analogue scale (VAS) to measure self-efficacy in resuscitation skills	Quantify the relationship between categories of BMI and incident asthma and also the impact of gender with this relationship	To explain and describe the works of this commission as well as stress the need for creating conditions in which health and well-being flourish	To calculate the global burden of disease and risk factors for 2001, and to examine regional trends	Development of ethical implications associated with the highly prevalent health campaigns for personal responsibility associated with healthy lifestyles	Examines health promotion and disease prevention from the perspective of social cognitive theory	Better understanding of how preventive actions and barriers vary by racial/ethnic groups This knowledge will contribute to better health promotion programs

<p>Population Studied/Sample/Size/Criteria/Power</p>	<p>N=116 (52 doctors, 41 nurses, 22 medical students, 1 unknown)</p>	<p>Seven studies, 102 subjects, n=333</p> <p>Systematic search yielded 2,006 references of 1,569 were unique</p> <p>Pre specified inclusion criteria, a title review rejected 1, 474 references, yielding 95 candidate abstracts. A subsequent abstract review rejected 82 of these references, yielding 13 candidate studies</p> <p>After each of these studies was reviewed in its entirety, 7 studies were found to meet the pre specified inclusion criteria</p>	<p>The world population is the subject of this article</p>	<p>8700 data sources to obtain case numbers</p>	<p>All populations of all socioeconomic levels, race, gender</p>	<p>No new population selected for this article</p> <p>Graphs and data from references representing populations from previous studies with and without social cognitive theory</p>	<p>210 black, 171 Hispanic, 618 white/others</p>
<p>Methods/Study/Appraisal/Synthesis Methods</p>	<p>Cronbach's alpha, mean, SD all statistical analysis done with SPSS</p> <p>Spearman's how</p>	<p>The 7 included studies reported odds ratios with a CI of 95% Comparison studies also used an odds ratio</p>	<p>Increase population awareness through Knowledge Networks that provide a much</p>	<p>Calculated mortality, incidence, prevalence, and disability adjusted life years for 136</p>	<p>The 3 facets of ethical concerns for health campaigns are identified, attribution of causation,</p>	<p>Review of the literature, review and publication of previous studies using self-efficacy</p>	<p>Descriptive analysis of respondent characteristics knowledge level, preventative actions, and</p>

	<p>to measure correlation</p> <p>Wilcoxon and Mann-Whitney tests used to compare paired and unpaired data samples P-value of less than or equal to 0.01 was considered significant</p>	<p>with a CI of 95%</p> <p>Meta-analysis provided a precise estimate of the odds of incident asthma for individuals who are overweight or obese</p>	<p>stronger evidence base that has previously been available on the social determinants of health and health equity</p>	<p>diseases and injuries for 7 income/ geographic country groups estimated mortality and disease burden attributable to 19 risk factors</p>	<p>obligation, and agency and explained</p> <p>After the explanation a table is designed for practice-oriented questions to delineate ethical concerns regarding personal responsibility</p>	<p>Interpretation of the data and findings by the author of the article</p>	<p>barriers to preventive action</p> <p>Logistic regression models were used to determine factors associated with knowledge of the leading cause of death and healthy risk factors</p>
<p>Primary Outcome Measures and Results</p>	<p>Cronbach's alpha for pediatric resuscitation overall was 0.77</p> <p>Self-efficacy was measured for each resuscitation task with the mean and SD</p>	<p>The summary for 1-year incident asthma in overweight and obese vs. normal-weight mean and women was 1.51(95% CI, 1.27-1.80)</p> <p>A dose-response effect to this relationship was observed, with increasing BMI being associated with increasing odds of incident asthma overweight vs. non overweight was 1.38 (95% CI, 1.17-1.62) These are 2 of the 7 studies</p>	<p>WHO is no longer the leading automatic position as the global voice on public health</p> <p>With the knowledge networks there are now other credible sources and organizations such as Bill and Melinda Gates foundation, Global Fund to fight AIDS, to name a few</p>	<p>Nominal data sets expressed as totals and %</p>	<p>Appeals to personal responsibility in health campaigns require responsible application</p> <p>Responsibility has been a central notion in public discourse on autonomy, equity, and social regulation of behavior. Resulting in ethical consequences if not handled appropriately</p>	<p>Identified 3 major components in the social cognitive theory for promoting psychosocial change society-wide</p> <ol style="list-style-type: none"> 1. sound theoretical model 2. translation and implemental model 3. social diffusion model 	<p>SPSS Logistic Regression Version 12.0.1 was used to fit 5 models and also used to fit a model of predictors of taking preventive action</p>

<p>Author Conclusions/ Implications of Key Findings</p>	<p>The VAS is a potential quick and simple measure of self-efficacy</p> <p>There was no correlation between the Questionnaire and the VAS for resuscitation overall when all participants were included but when Drs. and nurses were studied separately a reasonable correlation occurred reflecting the differences in the roles of the 2 groups during resuscitation</p>	<p>The odds of incident asthma are increased 50% in overweight or obese individuals as a whole</p> <p>Clear dose-response relationship between BMI and asthma, suggesting that asthma risk increases further as weight increases</p> <p>Overweight and obesity are associated with a dose-dependent increase in the odds of incident asthma in men and women, suggesting asthma incidence could be reduced by interventions targeting overweight and obesity</p>	<p>The Commission on the Social Determinants of Health provides a global overview of the importance of the social determinants of health and the centrality of privileging strategies that create fairness both between and within countries</p>	<p>The conclusions were extensive from multiple diseases to low, med, high income levels</p> <p>To focus just on ischemic heart disease, the difference of low/med income level to high income level was remarkable.</p> <p>What was also interesting was there were no communicable diseases as the top 10 leading causes of death in the high income countries</p>	<p>The authors urge campaign practitioners, scholars, and members of the intended population to consider the types of issues raised by the propositions and the practice-oriented questions that are associated with these 3 facets of responsibility</p>	<p>Contribution to the betterment of human health needs a broad perspective on health promotion and disease prevention beyond the individual level</p>	<p>CHD is the leading cause of death among women varied by racial/ethnic group. It was significantly lower in black vs. white/other participants odds ratio 0.39, 95% CI (0.26-0.59) and in Hispanic vs. White/other participants odds ratio 0.32, 95% CI (.0.21-0.49)</p> <p>Blacks and Hispanics are less likely than whites/others to be aware of health healthy HDL-C and LDL-C levels</p> <p>Multiple tables on predictors of awareness, actions taken to lower personal risk</p>
<p>Strengths/ Limitations</p>	<p>Strengths – Multiple correlations – the VAS and questionnaire, the individual</p>	<p>Strengths – I found a variable that was mentioned was the fact that asthma and the</p>	<p>Strengths – very informative article on reinventing health promotion Limitations –</p>	<p>Strengths – The most common causes of death were not just analyzed but compared to</p>	<p>Strengths – very informative, gave new insight to patient teaching Limitations – None noted</p>	<p>Strengths- Comprehensive review of Social Cognitive Means and related theories</p>	<p>Strengths – Adjustments for covariates including education level and knowledge</p>

	<p>resuscitation skills, and self-efficacy correlated to the skills</p> <p>Use of multiple disciplines Limitations – small sample size</p>	<p>medications treatment (steroids) often contribute to obesity by limited activity and increased appetite Limitations – Had a difficult time interpreting the actual sample since there were not actual patients. I am sure this is the reviewers issue and not the researcher</p>	None noted	<p>more affluent countries</p> <p>Very interesting data although not surprising Limitations – None noted</p>		<p>Identified the need for implementing these theories for our population living longer and also living longer with chronic diseases Limitations – None noted</p>	<p>of other risk factors attributed to the validity of this study of expected results Limitations – The age of the sample was too young</p> <p>Expectations of HD knowledge and preventative behaviors of people in their 20's and even some in their 30's is unrealistic</p>
Funding Source	Grant from the Dutch Foundation of ER Medical Care of Children	University of HFS lab	Department of Public Health, Flinders University of South Australia	NIH grant and by the Disease Control Priorities Project, which is funded by the Bill and Melinda Gates Foundation FIC of NIH, World Bank WHO	Universities of Authors	Not published, unknown	Columbia University
Comments	<p>The possibility to using an audio-visual tool to make assessments is an interesting idea</p> <p>Unfortunately the tool was not published in this article and is</p>	The subject matter of this research, risk factors, body weight, and epidemiology will be very useful in my Capstone Project addressing risk factors for heart	<p>WHO will be a reference for my Capstone on establishing an underserved population</p> <p>Will be researching the 2008 report and including it in</p>	<p>This research was a comprehensive world population</p> <p>I will be doing something similar but on a national level and state level. I will be</p>	<p>This is an excellent article to reference for patient teaching in simulation for patients with HD</p> <p>The majority of patients with HD are related to lifestyle as well</p>	<p>This article by the Author of the Self-Efficacy theory is an excellent resource for patients with health problems and at risk for disease to take control of their</p>	<p>Although I found the results to be predictable the risk for HD is my capstone project and provides evidence for my work</p>

	<p>available in Dutch, not real helpful, but does lead to more research on the topic</p> <p>Is a possibility since all simulation will be taped and saved</p>	<p>disease with common factors identified in this article</p> <p>The use of a systematic search using data bases is what I will be doing</p> <p>Although I will not be proving the risk factors contribute to HD as they are already well established</p>	<p>this systematic review</p> <p>Health promotion, socio-economic, and population health are an important aspect of my project</p>	<p>evaluating the risk factor of HD in Tulare Co.</p> <p>This is a good example of displaying nominal data</p>	<p>as those patients at risk for HD are from lifestyles and life situations</p> <p>Patients cannot always relate to health professionals due to education levels and socioeconomic levels</p> <p>This article provides excellent perceptions of patients to topics of responsibility</p>	<p>lives and health</p> <p>Multiple other theories are explored as well, health belief model, theory of reasoned action, and protection motivation theory</p> <p>Only the author of self-efficacy can have the final line in the article, "may the efficacy force be with you"</p>	
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Articles 22-28

Article Title And Journal	A Unique Simulation Teaching Method <i>Journal of Nursing Education</i>	Clinical Judgment Development: Using Simulation to Create an Assessment Rubric <i>Journal of Nursing Education</i>	Clinical Judgment: The last Frontier for Evaluation <i>Nurse Education in Practice</i>	Thinking Like a Nurse: A Research-Based Model of Clinical Judgment in Nursing <i>Journal of Nursing Education</i>	Cardiovascular Risk Factor Trends and Potential for Reducing Coronary Heart Disease Mortality in the United States of America <i>Bull World Health Organization</i>	The Economic Burdon of Obesity Worldwide: A Systematic Review of the Direct Costs of Obesity 2010 <i>International Association for the Study of Obesity</i>	Responsibility for Health : Personal, Social, and Environmental <i>Journal of Medical Ethics</i>
Author/Year	Kim Hawkins Martha Todd Julie Manz 2008	Kathie Lasater 2007	Kathie Lasater 2011	Christine Tanner 2006	Simon Capewell Earl Ford Janet Croft Julia Critchley Kurt Greenlund Darwin Labarth 2010	D. Withrow D.A. Alter 2010	David Resnik 2007
Database and Keywords	CINHAL Simulation Pedagogy	CINHAL Simulation Pedagogy	CINHAL Simulation Pedagogy	CINHAL Simulation/ Nursing Education	Academic Search Premiere Obesity/heart disease	Academic Search Premiere Obesity/heart disease	Google Scholar Health/ Personal Responsibility
Research Design	Review of methods of simulation teaching	A cycle of theory-driven-description-observation-revision-review Was the design method based on Tanner’s Clinical Judgment Model	Review of the evidence-based Lasater Clinical Judgment Rubric (LCJR)	Review of the Tanner clinical Judgment Model	The use of the validated comprehensive CHD mortality model, IMPACT, which integrates trends in all the major CV risk factors	Literature Review Search strategy for eligible articles included MEDLINE, PubMed and Embase with key words economics, obesity, cost in various combinations	Strategies for health promotion developed through literature review

4 Tiered Levels of Evidence	Level IV	Level III	Level IV	Level IV	Level 1a	Level IV	Level IV
Study/Aim/Purpose	Simulation pedagogy development for nursing instructors	To develop a rubric as an assessment tool that delineated the expectation for a task or assignment specific to simulation	Aim of the research is to briefly describe an evidence-based clinical judgment rubric presents dimensions of clinical judgment	Develop a model that provides language to describe how nurses think when they are engaged in complex, underdetermined clinical situations that require judgment	To examine the potential for reducing cardiovascular risk factors in the United States of America enough to cause age adjusted CHD mortality rates to drop by 20% by 2010	Assess the current published literature on the direct costs associated with obesity	For society to responsibility for their health
Population Studied/Sample/Size/Criteria/Power	Nursing students experience with a 2 group method simulation Size not stated	48 BSN students	Lasater's work and others	Multiple works of authoritative authors	The U.S. population	Search results of articles Ovid <i>n</i> =793 Embase <i>n</i> =1363 PubMed <i>n</i> =938	6 leading factors contributing to the global burden of disease that are lifestyle related
Methods/Study/Appraisal/Synthesis Methods	Students were divided into 2 groups that follow one of 2 paths. Path A consists of care plan development and simulation Path B consist of simulation and documentation Students then reconvene as a large group for reflection	The students were divided into 12 students also divided into 4 care teams of 3 students Each patient care team engages in the scenario 2 phases, 1 phase was the active simulation and the 2 nd phase was the debriefing	The framework of the rubric authored by Tanner is explained and described in a table compared to LCJR dimensions With examples of questions to assess students	Tanner's Clinical Judgment Model is printed and interpreted with supporting evidence	IMPACT model explains the changes in CHD mortality rates observed in people The model also employs regression coefficients produced by Ig meta-analysis and cohort studies Coefficients and relative risk values were obtained from	Selection criteria for reviewed articles consisted of inclusion criteria and exclusion criteria documented in a table	States there is a well-documented relationship between lifestyle, disease burden and healthcare costs, although not cited

					multivariate logistic regression analyses		
Primary Outcome Measures and Results	A table displaying the progression and plan of both paths was developed to easily follow	Descriptive and ANOVA tests were performed for 5 independent statistical variables on the rubric Mean clinical judgment skill for those engaged in the primary nurse role 22.98 SD=6.07 The observed range was 5 to 33 with a max of 44 points	Benefits of the rubric are reviewed -Formulating thought questions -Reflections -Self-evaluation -What students notice -The impact of reflection on clinical judgment development -Preceptor training and support -Reciprocal learning from students' transition to practice	Clinical judgments are influenced by what nurses bring to a situation Sound clinical judgment comes from knowing the patient and situations Clinical judgments are influenced by the context in a situation Nurses use a variety of reasoning patterns Reflection on practice is critical for development of clinical knowledge	Trends and estimates: There will be 15% more deaths than the observed population in 2000 from CHD 3 of the 6 major risk factors in this study would decline while obesity and diabetes increased Other information regarding trends in other risk factors are documented	Obesity was estimated to account for between 0.7% and 2.8% of the country's total healthcare expenditures Many of the studies have been criticized because they feel estimates of the burden of obesity on the healthcare system are conservative	Strategies for health promotion Cost of strategies Problems that are beyond the ability of the individual to deal with Strategies that are compatible with and encourage individual responsibility for health
Author Conclusions/ Implications of Key Findings	This approach to a simulated learning experience can easily be incorporated into nursing curricula	Students can better learn when they are clear about expectations and receive direct feedback about their performance	The LCJR offers a logical progression for educators and preceptors to devise questions that guide student thinking about patient	Research on Clinical Judgment and development of key findings of what makes better clinical judgment	Age-adjusted CHD mortality rates observed in 2000 remained unchanged, some 388,000 CHD deaths would occur in 2010	Obesity places a significant financial burden on the healthcare system	Findings are more the authors opinions Responsibility for health should be a collaborative effort among

		A rubric is a familiar tool for faculty and students	care		Healthy People 2010 CV risk factor targets would almost halve the predicted CHD death rates		individuals and the societies in which they live Individuals should care for their own health and help to pay for their own healthcare, and societies should promote health and help to finance the costs of healthcare
Strengths/ Limitations	Strengths – Extremely simple plan that makes a great plan to incorporate a clinical group as opposed to just a few students at a time in simulation Limitations – There was not information regarding the students perception of the method	Strengths – Incorporation of an evidence based tool, Tanners Clinical Judgment Model gave the basis for this rubric Limitations – There was not any validity testing of the rubric	Strengths – The Lasater Clinical Judgment Rubric is stated as a validated, evidence-based clinical judgment rubric Did not state that or was their evidence in the previous article Validation must have happened from 2007 to 2011 Limitations – It is difficult to objectify any part of the student or situation This is why	Strengths – Cites multiple authoritative authors and their theoretical and nursing education works Limitations – None noted	Strengths – Very informative for individual risk factors’ affect on CHD Also multiple information on demographics related to age and gender variables Recommendations for achieving reductions in mortality Limitations – None noted	Strengths –The large sample of literature reviewed and suggestions for further study Limitations – Although the issue of intangible costs associated with the decreased quality of life associated with obesity was not covered in the literature reviewed it would a great study to estimate loss of productivity, psychological, and social issues	Strengths – Strong in Socratic questioning as to what is the cause of lack in personal health and solutions to make changes Limitations – The article refers to itself as research but there is not any information as to databases the information was obtained The references are also limited

			rubric are so useful in clinical but is a limitation in simulation				
Funding Source	Creighton University	Oregon Health & Science University	Oregon Health & Science University	Oregon Health & Science University	Higher Education funding Council for England and United States Centers for disease Control and Prevention	Part funding from the Ministry of Health and Long-Term Care of Ontario and a scholarship from the Keenan Research Centre, St Michaels's Hospital	National Institute of Environmental Health Science National Institutes of Health
Comments	This is an excellent idea for simulation and incorporating nursing care planning in patient care and simulation as oppose to just psychomotor skills and assessment	I've been researching assessment tools for my project and using a rubric is a different idea and something myself and students are used to This particular rubric is very wordy and 2 pages long	The 7 elements listed in primary outcomes are all good points to address, assess, and even analyze in my project The rubric I think is too wordy but will be considered as well	The combination of these 2 authors, Tanner and Lasater have developed a comprehensive plan to assess the clinical judgment of nursing students in and out of simulation with evidence-based and also incorporates a theoretical frame	Excellent source to compare risk factors with CHD Able to compare risk factors in my Capstone (underserved area) to the national risk factor incidences and trends	Obesity is a major risk factor for HD and I plan to research and evaluate all risk factors for prevalence.	This is a very short article but bears the question of moral responsibility and personal health behaviors One aspect of my theory choice, self-efficacy addresses self confidence in accomplishing healthy behaviors This article address multiple strategies for health promotion

Articles 28-35

Article Title and Journal	Cardiovascular Disease Knowledge and Risk Perception Among Underserved Individuals at Increased Risk of Cardiovascular Disease <i>Journal of Cardiovascular Nursing</i>	Educational Inequalities in Ischemic Heart Disease Mortality in 44,000 Norwegian Women and Men: The Influence of Psychosocial and Behavioral Factors The HUNT study <i>Scandinavian Journal of Public Health</i>	Patient, Provider, and System Level Barriers to Heart Failure Care <i>Journal of Cardiovascular Nursing</i>				
Author/Year	Carol Homko William Santamore Linda Zamora Gail Shirk John Gaughan Robert Cross Abul Kashem Suni Petersen Alfred Bove 2008	Linda Ernstsens OttarBjerkese Steiner Krokstad 2010	Mindy McEntee Lori Cuomo Cheryl Dennison 2009				
Database and Keywords	CINHAL Cardiovascular Disease/ Underserved	Academic Search Premiere Education Level/Heart Disease	Academic Search Premiere Socioeconomic level/heart disease				
Research Design	The study was conducted at 2 institutions that provide healthcare	Cross sectional survey in a total country population in Norway , 75.8%	Literature Review of articles related to barriers to HF care				

	<p>considered to be medically underserved</p> <p>Subjects were recruited from the general outpatient populations of both institutions as well as flyers and presentations at local churches and community centers</p> <p>29 item questionnaire created for this study</p> <p>Ages between 18-85 with a 10% risk as determined by the Framingham risk predictors</p> <p>CVD Risk Knowledge</p> <p>CVD Risk Perception</p>	<p>of the population, 30 yrs. or older</p> <p>Clinical exam and self-report questionnaires during 1995-1997 were administered and collected</p>	<p>Barriers were reported at 3 levels, patient, provider, and system levels</p>				
Level of Evidence	Level III	Level Ia	Level IV				
Study Aim/Purpose	To examine knowledge of CVD risk factors and risk perception among individuals with high CVD risk	To better understand the relative social inequalities in ischemic heart disease (IHD) mortality, the disentanglement	To synthesis the research on barriers to HF care at the three levels				

		of the separate effects of psychosocial factors and behavioral factors required Investigate the association between education level and IHD					
Population Studied/Sample Size/Criteria/Power	465 inner city and rural individuals at high risk for HD	56,773 persons in Norway	60 articles from 1998 to 2007 on barriers to care meet the inclusion criteria				
Methods/Study Appraisal/Synthesis Methods	<p>Were analyzed using Cronbach alpha and a Likert scale</p> <p>All data reported as mean (SD)</p> <p>Student <i>t</i> tests were used to compare means of continuous variables was analyzed using</p> <p>Pearson product moment correlations</p> <p>Multiple regression analysis was used to assess the impact of</p>	<p>10 year age groups</p> <p>Standard population of men and women</p> <p>Cox regression analysis to estimate hazard ratios a 95% CI of death from ischemic heart disease (IHD)</p> <p>Departure from the proportional hazards assumption was evaluated using graphical procedures-log plots</p>	The review of the literature on barriers to HF care was conducted using PubMed, MEDLINE, and CINAHL databases using multiple search terms				

	demographic data on risk perception and knowledge	Estimated model calculating for education levels, age, and chronic disease					
Primary Outcome Measures and Results	Underserved individuals at high risk for CVD and reduced perception of CVD risk factor knowledge and a reduced perception of CVD risk despite being assessed as high risk by the Framingham model	<p>Mean and SD were calculated for age in both men, $m=50.7$ and women, $m= 50.3$</p> <p>By the end of the study 328 men had died of IHD and 223 women</p> <p>Number of deaths showed an inverse gradient with education, higher among those with primary education compared to those with tertiary education</p> <p>More adverse risk profiles among those at the primary education levels</p>	<p>75% of all studies reported on barriers at the patient level 38% of the barriers were at the provider level 22% were at the system level</p> <p>The barriers were all identified and described specially</p>				
Author Conclusions/ Implications of Key Findings	Underserved individuals at high risk of CVD demonstrated limited CVD risk factor knowledge and reduced	Low level of education was associated with adverse risk profiles and high risk of IHD mortality in this	The article substantiated HD requires evidence-based care by providers across multiple care settings in				

	<p>perception of CVD risk despite being assessed as high risk by the Framingham model</p>	<p>Norwegian population study The education gradient in regards to IHD was a sleeper in women compared to men</p> <p>Models and adjustments for psychosocial and behavioral factors may contribute to inequalities in IHD mortality in different levels of education</p>	<p>addition to active self-care by patients and their families or caregivers</p>				
<p>Strengths/ Limitations</p>	<p>Strengths – Although the sample were all identified as underserved they compared rural and urban populations with significant differences Limitations –It would interesting to compare these risk factors knowledge with a served population for a correlation and identification of disparity</p>	<p>Strengths – the large and well represented population size for the country The multiple statistical data and the adjustments made for certain criteria Limitations – Self report questionnaires can be limiting especially if you are determining differences in education and knowledge and</p>	<p>Strengths – A very concise identification of multiple barriers on 3 levels Multiple databases researched Limitations – None noted</p>				

		they are not medically confirmed					
Funding Source	Grant from the Commonwealth of Pennsylvania	Norwegian Research Council	Supported by Development Award from the National Institutes of Health				
Comments	<p>The patients addressed in my capstone are also in an underserved area and have the same limitations of risk factor knowledge and perception</p> <p>Identification of these factors and correlations of perceived risk and actual risk will be helpful in designing simulation</p>	<p>Education levels are a risk factor for my population in my underserved County Tulare County has a very high percentage that do not have a high school diploma, 33%, according to the US Census Bureau</p> <p>Findings of this research confirm risk related to education levels</p>	The multiple barriers will be great to incorporate in my simulation scenarios, especially the barriers at the patient level				

Appendix B

**SWOT ANALYSIS
DNP RESEARCH PROJECT**

Nursing Students' Experiences Using High-Fidelity Cardiovascular Simulation:
A Descriptive Study

Internal Environment Factors	
Strengths	Weaknesses
<ul style="list-style-type: none"> -Content mastery in cardiovascular assessment -Nursing students can reflect on their own skill sets -Nursing students may improve their self-confidence in identifying patients at risk for heart disease -Strengthen technology-enhanced teaching strategies to current nursing faculty -Utilization of the high-fidelity simulators 	<ul style="list-style-type: none"> -Anxiety related to simulation and videotaping of their performance -Students not taking simulation as a real situation -Students not accurately or honestly completing the demographic questionnaire or the evaluation forms -Skill of the faculty performing the simulation to provide a realistic and beneficial teaching intervention.
External Environment Factors	
Opportunities	Threats
<ul style="list-style-type: none"> -Nursing students bridge increased cognitive abilities from the simulation into practice -Support from the National League of Nursing (NLN) -California State grant recipient for establishing simulation into nursing education 	<ul style="list-style-type: none"> -Potential risk to privacy when students work together in a simulation setting

Appendix C

Logic Model for Nursing Students' Experiences Using High-fidelity Cardiovascular Simulation: A Descriptive Study

Terri Paden RN, DNPc

Regis University

Resources	Activities	Outputs	Outcomes	Impacts
Community College Associate Degree Nursing Program	Participation on a volunteer basis from 61 students	<i>n</i> students will complete the simulation	Increased assessment skills with patients and heart disease	Incorporate Simulation into nursing curricula
On site mentor, PhD Nursing Instructor	Establish student population data, (demographics), Research a validated tool for data collection	Demographics data collected and input into SPSS for analysis	Increased appropriate intervention with patients and heart disease	Simulation approved for partial clinical requirements by the state nursing boards
Laerdal High Fidelity simulation support staff	Develop a Cardiovascular test for through ATI	Students test results from the Pre and Posttest exam will be collected	Cognitive knowledge improvement following the simulation scenario	Simulation can be used to test and evaluate multiple nursing theories
Coordination with nursing faculty for clinical assignments	Select an NLN simulation scenario with cognitive and psychomotor skill objectives related to a Cardiovascular Event Select an self-confidence and evaluation tool and acquire permission for use	Students complete the NLN Student Satisfaction and Self-Confidence in Learning tool post simulation	Manikin status improves and stabilizes Students success in Assessment Communication Critical thinking Technical skills	Debriefing/Reflection help nursing students understand, analyze, and synthesize what they thought, felt, and did
Unlimited Access to the High Fidelity Simulation Lab	Schedule the clinical days for student participation	Students debrief/reflect in group setting	Through self-reflection and evaluation of classmates self-confidence increases	Increase in self-confidence will improve clinical performance
Statistical Assistance from Consultant	Pretest, Simulation Scenario, Debriefing of the simulation scenario, Posttest, Student Evaluation	Students evaluation of simulation experience and self-confidence questionnaire completed	All students participate in evaluation and self-confidence questionnaire	
	Collect Data	Analyze Data	Quantitative Findings	

Appendix D

Regis University (Basic ICD) CONSENT TO PARTICIPATE IN RESEARCH

Nursing Simulation: Nursing Students' Experiences Using High-Fidelity Cardiovascular Simulation: A Descriptive Study

You are asked to participate in a research study conducted by Terri Paden from the Loretta Heights School of Nursing at Regis University. This research is in partial fulfillment of the Doctorate in Nursing Practice Degree. Your participation in this study is entirely voluntary and you may withdraw at any time. Please read the information below and ask questions about anything you do not understand, before deciding whether or not to participate.

• PURPOSE OF THE STUDY

I have been informed that the purpose of this descriptive research is to determine if the simulation experience increases the student's knowledge of a patient with cardiovascular disease and if there is an increase in self-confidence using high-fidelity simulation as a teaching strategy.

• PROCEDURES

If you volunteer to participate in this nursing simulation research, you will be asked to do the following things:

- ATI content mastery test in cardiovascular assessment
 - The assessment test will be given before and after the simulation scenario
- Participate in a high-fidelity simulation scenario
 - Duration of the simulation scenario is approximately fifteen minutes, and 45 minutes of debriefing and reflection of the experience
- Debriefing of the simulation – You will participate in being recorded and videotaped for the purpose of debriefing that is standard practice for simulation evaluation
- Completion of the Student Satisfaction and Self-Confidence in Learning form
 - A questionnaire evaluation form rating simulation experience satisfaction and rating in self-confidence

The total time for the simulation experience will not exceed a clinical day.

The simulation experience is considered clinical time and will be performed during your clinical rotations whether or not you participate in the simulation, your grade for the course will not be affected.

• POTENTIAL RISKS AND DISCOMFORTS

There could be a potential risk of privacy when students work together in a simulation setting.

All video of your simulation experience will be deleted once the debriefing has been completed. There may be some anxiety related to simulation and videotaping of your performance.

• POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

I understand that participating in this study will directly benefit me by participating in the simulation experience to enhance my clinical knowledge and skills. I will have the opportunity to improve

my assessment skills in both cognitive and psychomotor domains with the complex patient. This will also benefit me as a future RN. This research could also benefit future nursing students in the development of high-fidelity simulation the nursing curriculum.

- **FINANCIAL STATEMENT**

There is no funding this research nor will you be reimbursed for your participation. There will be an opportunity to win an iPod for your participation through a drawing that will be performed at the conclusion of the simulation scenarios.

- **CONFIDENTIALITY**

Any information that is obtained in connection with this study will be reported as aggregate data. Any information that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of replacing your name with a numerical code.

Records (the signed informed consent documents and project data) will be stored in a locked file cabinet or computer that is password protected. Only the investigator and others authorized by the college will have access to the material. The data will be saved for three years and then shredded and deleted

- **PARTICIPATION AND WITHDRAWAL**

You can choose whether or not to be in this study. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits to which you are otherwise entitled. You may also refuse to answer any questions you do not want to answer. There is no penalty if you withdraw from the study and you will not lose any benefits to which you are otherwise entitled. Not participating in the study or withdrawal at any time will not influence your grade in the course

- **IDENTIFICATION OF INVESTIGATORS**

If you have any questions or concerns about this research, please contact Terri Paden, RN MSN (Office 559 737-6254, or Cell 559 967-3705, terrip@cos.edu) or Janet Lile RN, MSN, PhD, CNE (Office 559 730-3793, janetl@cos.edu) or Louise Suit, EdD., RN, CNS, CAS (Office 303 458-4187 or asuit@regis.edu).

- **RIGHTS OF RESEARCH SUBJECTS**

If you have any questions about your rights as a research subject, you may contact the Regis University Institutional Review Board (IRB) by mail at Regis University, Office of Academic Grants, Denver, CO by phone at (303) 458-4206, or e-mail the IRB at irb@regis.edu. You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with Regis. The IRB has reviewed and approved this study.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Printed Name of Subject

Signature of Subject

Date



Appendix E



*Division of Nursing and Allied Health
Associate Degree Registered Nursing Program*

September 28, 2011

To Whom It May Concern:

This letter is to confirm that Mrs. Terri Paden has obtained permission from the College of the Sequoias and the College of the Sequoias Division of Nursing and Allied Health to conduct her study on "Nursing Simulation: A Descriptive Study to Recognize the Patient at Risk for Heart Disease". In addition, Mrs. Paden has also obtained permission from the Division of Nursing and Allied Health to utilize the Hospital Rock High-Fidelity Clinical Simulation Lab for the activities associated with the research study. The Division of Nursing and Allied Health fully support Mrs. Paden in her efforts to conduct her study.

I feel Mrs. Paden's study will have positive long-range benefits for current and future nursing students and a positive impact on the curriculum of the Nursing and Allied Health Division. I look forward to assisting her in any way that I can in order for her to accomplish the purpose of the study.

Please contact me if you have any further questions or concerns.

Sincerely,

A handwritten signature in cursive script that reads "Karen Roberts".

Karen Roberts, RN, MSN, CNS
Director of Nursing

Appendix F

Student Satisfaction and Self-Confidence in Learning

Instructions: Check or circle the number (1-5) that best describes how you feel about each statement. You receive one point for each statement that you check or circle. There are no right or wrong answers. You will probably agree or disagree with the statements and disagree with others. Please indicate your own personal feelings about each statement by marking the number that best describes your attitude or feeling. Please be honest and describe your attitude as accurately as possible you would like for it to be. This is anonymous and the results being sent to the group are confidential.

Key:

- 1 = STRONGLY DISAGREE with the statement
- 2 = DISAGREE with the statement
- 3 = UNDECIDED (you neither agree nor disagree with the statement)
- 4 = AGREE with the statement
- 5 = STRONGLY AGREE with the statement

Satisfaction with Current Learning	SD	D	UN	A	SA
1. The learning materials used in this simulation were helpful and effective.	0.1	0.1	0.3	0.4	0.1
2. The study included the most variety of learning materials and not a little bit of any learning materials in terms of type.	0.1	0.2	0.1	0.4	0.2
3. The type of learning materials used in this simulation.	0.1	0.1	0.2	0.4	0.2
4. The teaching materials used in this simulation were interesting and helpful to learn.	0.1	0.1	0.1	0.4	0.3
5. The learning materials' organization was suitable with respect to content.	0.1	0.1	0.2	0.4	0.2
Self-Confidence in Learning	SD	D	UN	A	SA
6. I am confident that my understanding of the simulation activity was as good as that presented to me.	0.1	0.2	0.1	0.4	0.2
7. I am confident that I can understand and explain the concepts presented in the simulation activity.	0.1	0.2	0.2	0.4	0.1
8. I am confident that I can apply the knowledge I have gained from this simulation activity to my own work.	0.1	0.1	0.2	0.4	0.2
9. My understanding of the simulation activity was as good as that presented to me.	0.1	0.1	0.2	0.4	0.2
10. I am confident that I can understand and explain the concepts presented in the simulation activity.	0.1	0.1	0.2	0.4	0.2
11. I am confident that I can apply the knowledge I have gained from this simulation activity to my own work.	0.1	0.1	0.2	0.4	0.2
12. I am confident that I can understand and explain the concepts presented in the simulation activity.	0.1	0.1	0.2	0.4	0.2
13. I am confident that I can apply the knowledge I have gained from this simulation activity to my own work.	0.1	0.1	0.2	0.4	0.2

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Appendix G

It is my pleasure to grant you permission to use the “Educational Practices Questionnaire,” “Simulation Design Scale” and “Student Satisfaction and Self-Confidence in Learning” NLN/Laerdal Research Tools. In granting permission to use the instruments, it is understood that the following assumptions operate and "caveats" will be respected:

1. It is the sole responsibility of (you) the researcher to determine whether the NLN questionnaire is appropriate to her or his particular study.
2. Modifications to a survey may affect the reliability and/or validity of results. Any modifications made to a survey are the sole responsibility of the researcher.
3. When published or printed, any research findings produced using an NLN survey must be properly cited as specified in the Instrument Request Form. If the content of the NLN survey was modified in any way, this must also be clearly indicated in the text, footnotes and endnotes of all materials where findings are published or printed.

I am pleased that material developed by the National League for Nursing is seen as valuable as you evaluate ways to enhance learning, and I am pleased that we are able to grant permission for use of the “Educational Practices Questionnaire,” “Simulation Design Scale” and “Student Satisfaction and Self-Confidence in Learning” instruments.

Nasreen Ferdous | Administrative Coordinator for Grants/R&PD | National League for Nursing |

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nferdous@nln.org | Phone: 212-812-0315 | Fax: 212-812-0391 | 61 Broadway | New York, NY 10006



Appendix H

STUDENT DEMOGRAPHIC QUESTIONNAIRE

Student Name _____ Date _____ Code _____
Leave Blank

1. Gender:
 - Male
 - Female

2. Age:
 - 25 or under
 - 26-40
 - 41-55
 - 56 or older

3. Ethnicity: How would you describe your ethnic/cultural heritage?
 - American Indian/Native American
 - Asian-American
 - Black/African-American
 - Hispanic/Latino-American
 - White/Caucasian
 - Pacific Islander
 - Multi-racial
 - Other: _____

4. Marital Status:
 - Single
 - Married
 - Divorced
 - Widow/Widower
 - Domestic Partner

5. Number of Children Living With You:
 - None
 - 1-2
 - 3-4
 - More than 4

6. Primary Language
 - English
 - Arabic
 - Spanish
 - Other: _____

7. Multi-Lingual: How many languages do you speak, read and write?
 1-2
 3-4
 5 or more
8. Education: What degrees have you earned? Check all that apply.
 High School Diploma
 GED
 Associate Degree: Subject _____
 Baccalaureate Degree: Major _____
 Master's Degree: Major _____
9. Employment: What is your current employment status?
 Non-employed
 Employed Full-time: Position _____
 Employed Part-time: Position _____
10. Past Medical Employment: Have you ever worked in the medical field?
 No
 Yes:
Position(s) _____
11. Current Medical Employment: Do you presently work in the medical field?
 No
 Yes:
Position _____
12. Work Hours: If employed, how many hours per week do you work?
 8 hrs or less per week
 9-12 hrs per week
 13-16 hrs per week
 17-20 hrs per week
 21-24 hrs per week
 25 hrs or more per week
13. Financial Status: How would you describe your immediate family's financial status?
 I am the only wage earner for my family
 I am one of two wage earners for my family
 I am one of 3 or more wage earners in my family.
 I live with someone who supports me financially
 Other: _____

14. Financial Aid: Do you currently receive financial aid to attend school?
 No
 Yes:

Source(s)_____

15. Nursing Student Status:
 I have not had to repeat any nursing courses since enrolling in the nursing program
 I have had to repeat 1 or more nursing courses since enrolling in the nursing program

16. Current GPA:
 < 2.0
 2.0-2.5
 2.6-3.0
 3.1-3.5
 3.6-4.0

17. Clinical Remediation: How many times have you been placed on remediation since enrolling in the nursing program?
 None
 Once
 More than once

18. Skills Lab Referral: How many times have you been referred by your clinical instructor to attend Open Skills Lab since enrolling in the program?
 None
 Once
 More than once

19. Generally speaking, how comfortable do you feel using a computer?
 Very comfortable
 Somewhat comfortable
 Not very comfortable
 Not at all comfortable

20. Generally speaking, how comfortable are you in taking computer tests?
 Very comfortable
 Somewhat comfortable
 Not very comfortable
 Not at all comfortable

21. Do you require special testing assistance such as more time, controlled testing environment, large-print, test reader, etc.?

- No
 Yes:

Describe_____

22. Simulation Experience: How many times have you participated in simulated clinical nursing scenarios/experiences since enrolling in the nursing program?

- None
 1-3
 4-6
 7-9
 10 or more

23. Learning Style: How do you best learn? Select all that apply

- Auditory
 Visual
 Other:

Describe_____

24. Cardiovascular Patient Care Experience: How many times have you taken care of patients with cardiovascular problems since enrolling in the nursing program?

- None
 1-3
 4-6
 7-9
 10 or more

25. Participant in a Research Project: Have you ever been a subject in a research project?

- Never
 Yes:

Describe_____

Appendix J

IRB – REGIS UNIVERSITY

November 1, 2011

Terri Paden
4044 W Crowley Ct
Visalia, CA 93291

RE: IRB #: 11-328

Dear Terri:

Your application to the Regis IRB for your project "Nursing Simulation: A Descriptive Study to Recognize the Patient at Risk for Heart Disease" was approved as an expedited study on November 1, 2011.

Supporting reference information from the chair: "...is approved as an expedited study under HHS Categories of Research numbers 6 and 7 (data collected from recorded interviews and survey research).

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. Projects which continue beyond one year from their starting date require IRB continuation review. The continuation should be requested 30 days prior to the one year anniversary date of the approved project's start date.

In addition, it is the responsibility of the principal investigator to promptly report to the IRB any injuries to human subjects and/or any unanticipated problems within the scope of the approved research which may pose risks to human subjects. Lastly, it is the responsibility of the investigator to maintain signed consent documents for a period of three years after the conclusion of the research.

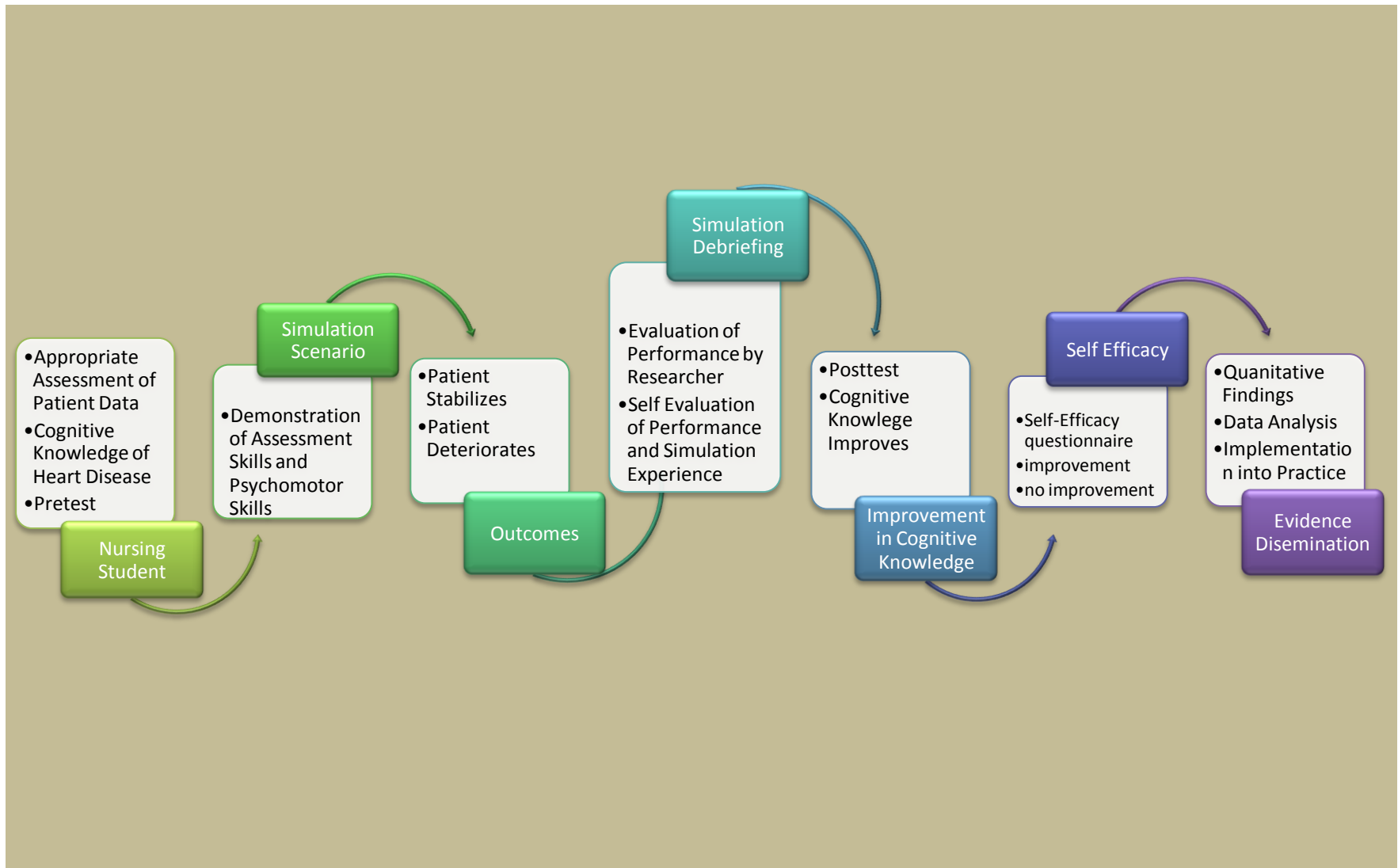
Sincerely,

Daniel Roysden, Ph.D.
Chair, Institutional Review Board

cc: A. Louise Suite, Ed.D.

Appendix K

Linear Conceptual Model of the DNP Project



Appendix L

DNP Process Model and Timeframe (Zaccagnini, 2011)

Steps	Activities	Timeframe
Step I: Problem Recognition	Identified need Problem statement Literature systematic review	August 2010 – May 2011
Step II: Needs Assessment	Identify population/community Identify sponsor and stakeholders Organizational assessment Assess available resources Plan desired outcomes Team selection Cost-benefit analysis	June 2011 – August 2011
Step III: Goals, Objectives and Mission Statement	Goals Process/outcome objective Develop mission statement	June 2011 – August 2011
Step IV: Theoretical Underpinnings	Theories of change Theories to support project framework	August 2010 – September 2010
Step V: Work Planning	Project proposal Project management tools Milestones Timeline Budget	June 2010 and November 2011
Step VI: Planning for Evaluation	Develop an evaluation plan Logic model development	June 2010 and November 2011
Step VII: Implementation IRB Approval	Threats and barriers identified Monitor implementation phase Project closure	November 2011 - December 2011
Step VIII: Giving Meaning to the Data	Quantitative Data	January 2012 - February 2012
Step IX: Utilizing and Reporting the Results	Written dissemination Oral dissemination Electronic dissemination	February 2012 – April 2012