

**WHAT IS THE EFFECT OF SIMULATION ON KNOWLEDGE ACQUISITION  
IN A SECOND SEMESTER ASSOCIATE DEGREE NURSING  
GERONTOLOGICAL COMMUNITY HEALTH CLASS?**

by

Cynthia Ashby

JOANN MANTY, DNP, Faculty Mentor and Chair

MARYLEE BRESSIE, DNP, Committee Member

CAROLYN WASHINGTON, DNP, Committee Member

Patrick Robinson, PhD, Dean, School of Nursing and Health Sciences

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**Abstract**

**Introduction:** Simulation is an effective teaching method that improves learning, enhances clinical decision-making processes, increases confidence in nursing practice, and allows for mistakes without harm to patients. Simulation is used in community college nursing programs to enhance learning. A need was identified to develop teaching strategies to aid nursing students to transfer theoretical knowledge to clinical practice at a community college nursing program.

**Methods:** A clinical improvement project was implemented to assess if simulation enhanced knowledge acquisition in the community health portion of the course that translates to the clinical application evaluated via a computerized proctored exam covering community health.

**Results:** There was an improvement on the computerized proctored exam after the simulation intervention.

**Conclusions:** Simulation proved to be an effective tool to improve the transference of theoretical nursing knowledge to clinical practice.

**Keywords:** Simulation, knowledge acquisition and nursing students.

### The Effects of Simulation on Knowledge Acquisition in Nursing Students

There has been an increase in the use of simulation in nursing education. With advances in technology and the continuous evolution in nursing education, simulation use has had positive learning outcomes in nursing education (Handley & Dodge, 2013). Simulation has shown to improve learning in nurses and nursing students. It is an effective teaching method that improves learning, enhances clinical decision-making processes, increases confidence in nursing practice, and allows for mistakes without harm to patients (Kaddoura, 2010). Simulation is used at a local community college nursing program to enhance learning. There was an identified need to develop teaching strategies that aid nursing students to transfer theoretical knowledge to clinical practice. The nursing program is a four-semester associate degree program. A project was implemented in the associate degree-nursing project to address the identified need. The purpose of the project was to improve the scores and pass rate on a computerized proctored exam in community health nursing. At the end of the implementation, there was an additional, brief qualitative portion that asked students about their feelings regarding the improvement project. This clinical improvement project supported the development of teaching strategies to resolve the gap in learning at the college. This paper will explain the history of simulation and nursing theories applied in a simulation intervention to improve knowledge acquisition in a second semester associate degree nursing gerontological community health course. This paper will also evaluate outcomes resulting from the simulation implementation with the nursing students.

Health organizations are focused on creating a work environment that is conducive to productivity, patient satisfaction, nurse satisfaction, promoting quality care, and a healthy professional setting (Stefanski & Rossler, 2009). Nurse leaders have verbalized a concern regarding clinical practice readiness of new graduate nurses. About 25% of nurse executives

were satisfied with the clinical performance of new graduates, while more than 25% were somewhat dissatisfied or worse (Berkow, Virkstis, Stewart, & Conway, 2009). Therefore, it is critical for nursing programs to implement teaching strategies that will produce new graduate nurses that are fully prepared for the healthcare industry. Simulation is one strategy that allows for the necessary training to graduate competent nurses for the healthcare profession.

### **Simulation at a Community College**

In the community college nursing program, simulation is used as a teaching method to develop and enhance critical thinking skills in all classes of nursing students. The community college nursing program is a four-semester associate degree-nursing program. The program uses Assessment Technologies Inc. (ATI) as a learning and assessment adjunct educational device. Each course in the nursing program has corresponding ATI proctored computerized exams that must be passed with a level two or higher in order for the student to be allowed to progress in the nursing program. If a student acquires a level two or higher on the ATI proctored exams, that student has a high probability of passing the National Council Licensure Examination (NCLEX) in that area of nursing knowledge (ATI, 2014). The faculty noted that many students passed clinical but did not carry over basic assessment skills and critical thinking skills from one semester to the next. Considering nursing students inability to transfer theory to clinical, three simulation courses were created and piloted at the college. All simulation sessions were taped and debriefed on an individual basis. After one semester simulation courses were created and approved by the Board of Registered Nurses as required courses for first, second and third semester nursing students. Currently simulation is used in the nursing program to enhance learning for students in the associate degree-nursing program. Because simulation is currently

used in the nursing program, it is a suitable method to improve student knowledge retention in an area of identified need.

Prior to the improvement project, all nursing students were required to take the proctored computerized ATI Exam at the end of each course in the curriculum. ATI is a comprehensive predictor of the probability of a student passing the NCLEX in various nursing areas. Although the simulation classes have shown positive results, there was still an identified gap in second semester students in the gerontological community health-nursing course.

While simulation teaching has shown an improvement in nursing student learning at the college, there was a need to show if the simulation knowledge would transfer from the classroom to application specifically in community health nursing. During the second semester, students receive eight weeks of lecture and clinical training in gerontological community health nursing. The clinical portion of the class provided training in the hospital for the geriatric patient. There was no clinical training for the community health portion of the class. The students only received lecture for the community health section of the course. At the end of the gerontological community health course, the students were required to take a proctored computer based ATI exam that focused on the community health segment of the class. Although the students were receiving lectures regarding community health, using ATI resources for additional learning, and completing a community visit, many were not passing the ATI proctored exam at the end of the course. The following data reflects the percentage of students who did not pass the ATI proctored exam for community health: 37.5% for fall 2013, 23% for spring 2013, and 40.7% for fall 2012. Ultimately a goal of nursing education is to make sure nursing students are properly prepared for the nursing profession. The clinical improvement project was implemented to evaluate if mock scenarios enhanced knowledge acquisition in the community health portion of

the course that translated to clinical application evaluated via the computerized proctored community health ATI exam.

There are five areas of content tested on the community health proctored ATI exam, which include management of care, safety and infection control, health promotion and maintenance, psychological integrity, and physiological adaptation. The three areas of the proctored exam in which the students needed improvement were health promotion and maintenance, safety and infection control, and psychological integrity. Over three previous semesters in the nursing program, students who scored level 2 or higher on the ATI community health test, scored the lowest in these areas: health promotion and maintenance = 64%, safety and infection control = 67%, and psychological integrity = 66%. Simulation was used to improve test scores in above named three areas on the computerized proctored community health ATI exam.

### **Background Literature Review**

Learning takes place through cognitive, psychomotor, and affective domains, thus nursing education utilizes the classroom, the laboratory, and the clinical setting to teach nursing students (Nehring & Lashley, 2009). Nursing programs are utilizing simulation to strengthen learning for nursing students because of limited clinical placements, to improve clinical learning, and provide a risk free, realistic, clinical setting (Gordon & Buckley, 2009). Adult learners need a learning environment that stimulates thinking, decision making, and enhances knowledge acquisition (Stefanski & Rossler, 2009). Imitating clinical situations provide an active learning environment, which requires participation that augments the learning process. Active teaching strategies motivate adult learners because it is interactive and inspires participation by the learner (Stefanski & Rossler, 2009). Studies have shown recreation of clinical practice provide a safe,

risk free environment for nursing practice performance, skills assessment, problem solving, critical thinking, clinical confidence building, encouragement of teamwork while assisting in a reduction of errors in the clinical setting (Stefanski & Rossler, 2009). Good teamwork is an important part of healthcare treatment plans because it decreases patient's length of stay, reduces nurse turnover, increases quality care, and improves the ability to meet the needs of patients and their families (Gordon & Buckley, 2009). Simulation combined with traditional teaching methods improves the learning process (Gordon & Buckley, 2009).

Active teaching strategies are critical in student knowledge acquisition (Caputi, 2014). Lecture is still a productive teaching method in the classroom but needs to be enhanced with active teaching strategies to engage critical thinking skills in nursing students (Caputi, 2014). Simulation is an active teaching technique that cultivates critical thinking and clinical reasoning (Caputi, 2014).

Around the 1970's, nursing education discovered students were able learn on their own with clear learning objectives. Around that same time, technology started to be more affordable and could be utilized as tools on enhance student learning. Audio tutorial were among the first technological tools used to augment student education. In the 1980's computers started to become more popular, once the use of computers became comfortable, there was a progression to the use of computerized manikins in the 1990's for healthcare education. Today, simulation is used in a variety of ways to expand student learning in a realistic, meaningful, safe environment to positively impact patient care (Jeffries, 2014).

With the rapid change in healthcare, simulation has emerged and evolved for healthcare professional education (Jeffries, 2014). Actual clinical experience supplements nursing education for practical and theoretical nurse training but can be complex and risky to the patient.

Simulation used as a learning strategy is based on cognitive science with adult learning theories with no risk to the patient (Jeffries, 2014). Simulation utilizes individual learning styles for processing data while engaging learners through visual, kinesthetic, and auditory methods for administering new information (Jeffries, 2014).

### **Project Design**

The project included a qualitative design that composed of data collected before and after the implementation of four simulation scenarios. The purpose of the project was to improve the scores and pass rate on a computerized proctored exam in community health nursing. At the end of the implementation, there was an additional, brief qualitative portion that asked students about their feelings regarding the improvement project. Students verbalized positive feelings regarding the implementation of simulation to enhance learning.

### **Nursing Education Simulation Framework**

The nursing education simulation framework (NESF) by Jeffries was the theory used for the simulation intervention. The NESF model was used with the teacher as the facilitator, the students as the participants, and the educational practices that involved active learning, feedback, interaction, collaboration, and expectations. The learning outcomes with the simulation design characteristics are important aspects of the NESF. The design characteristics include fidelity, problem solving, learning objectives, student support, and debriefing (Jeffries, 2014). Debriefing is an important piece of the simulation because that is where an excessive amount of learning and reflection occurs with students (Jeffries, 2014). Debriefing is defined as a time period after simulation that students reveal and share experiences that occurred during the simulation that comprises of what was done well, what needs improvement, and what was felt and learned during the simulation (Jeffries, 2007). Debriefing also allows for the participants to recount the

experience, describe what occurred in order to understand appropriate and inappropriate actions, behaviors, decisions, and judgments made during the simulation (Jeffries, 2014). Debriefing is an opportune time for students to diffuse emotions, reflect on practice, receive affirmation for proper nursing practice, as well as point out areas for improvement (Jeffries, 2014). Debriefing allows immediate feedback and reinforces learning, which is an important part of the active learning process.

### **Benner's Theory**

The other nursing theory used for the simulation intervention was Benner's theory novice to expert (Alligood & Tomey, 2010). Benner's theory of skill achievement is an essential theory that drives nursing education in the theoretical and clinical setting. Nursing students achieve milestones upon their journey in their nursing career that begins in nursing school (Jeffries, 2014). Benner's theory novice to expert focuses on a rising, living, practice for learning from clinical nursing practice through assembly and interpretation of standards (Alligood & Tomey, 2010). The concepts involved in Benner's theory include the novice, advanced beginner, competent, proficient, and expert (Alligood & Tomey, 2010).

According to Benner, the nurse evolves through a series of learning that progressively improves with time, experience, and practice (Alligood & Tomey, 2010). The novice stage of skill acquisition includes the notion that the individual has no experience or knowledge of the situation. In the next stage, the advanced beginner, the person is able to demonstrate minimal nursing clinical duties. The competent stage involves competent performance by the individual. At the proficient stage, the learner is able to perceive the situation as a whole and recognize the most relevant aspects of the situation instead of fragments of the scenario. The last stage of the model is the expert. In this stage the individual no longer relies on guidelines alone but has an

instinctive knowledge of the situation and acts appropriately (Alligood & Tomey, 2010). The participating nursing students were all considered to be novice to advanced beginners. Because the students were in their second semester of nursing school, they placed between these two stages of Benner's theory. With that in mind, there was an extensive amount of learning opportunities available in the use of simulation to improve knowledge acquisition. Any knowledge obtained during the simulations aided the students to advance through Benner's stages of nursing practice.

Simulation teaching has proven to be an effective tool to improve learning, but can it help knowledge acquisition? The project evaluated if simulation improved knowledge retention by implementing scenarios that were applicable to community health. The intervention effects were measured by the results of the proctored ATI examination of community health given at the end of the course. A comparison was done with classes that received the simulation and classes that did not receive simulation. Simulation scenarios were created to enhance, improve, and further develop knowledge attainment in in the Gerontological Community Health course.

### **Participants**

During the time period fall 2014 and spring 2015 semesters, second semester nursing students in an associate degree program participated in a simulation intervention in the gerontological community health nursing course. The student group was composed of three cohorts ( $n = 38$ ). The three cohorts were in the course a total of eight weeks. There were four simulations presented to the students with one instructor as the facilitator.

### **Instrumentation**

The ATI computerized proctored examination was used to evaluate knowledge acquisition regarding the community health portion of the course. ATI is a company that offers

NCLEX preparation assessment tools to help prepare students to pass the NCLEX, develop critical thinking, and improve nursing knowledge during nursing school (ATI, 2014). ATI provides computerized exams to test nursing student's knowledge and application for various subjects taught in nursing programs. ATI computerized exams are a great instrument to evaluate the student's probability of passing the NCLEX and achieved knowledge in various areas of nursing.

### **Simulation Intervention**

Students participated in four community health simulation scenarios that focused on health promotion and maintenance, safety and infection control, and psychological integrity. Specifically the simulations addressed: health screening (health promotion and maintenance), standard precautions/transmission based precautions (safety and infection control), and cultural diversity (psychological integrity). All areas of student weaknesses were applied in each scenario.

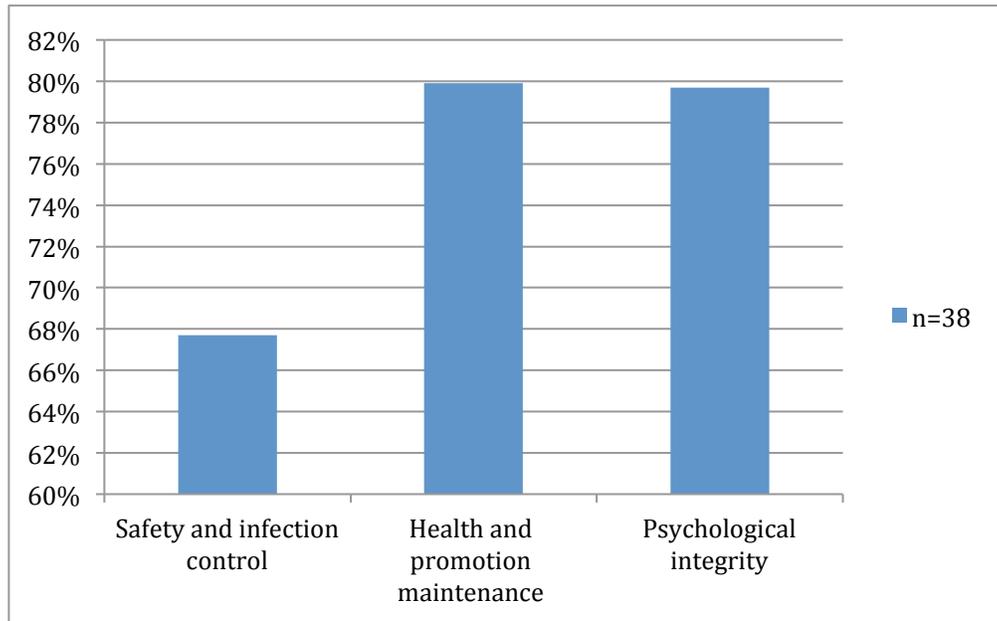
At the end of the simulation intervention, a comparison was done to evaluate if the simulation scenarios affected student knowledge acquisition regarding health screening, standard precautions/transmission based precautions, and cultural diversity using the ATI community health proctored exam scores. The ATI computerized exam aided in the evaluation of nursing students applying learned theoretical and clinical understanding in a realistic situation that might occur in the nursing profession.

### **Results**

The calculated means for the total results of the ATI computerized proctored exam in community health for the three cohorts after the intervention were as follows: Safety and

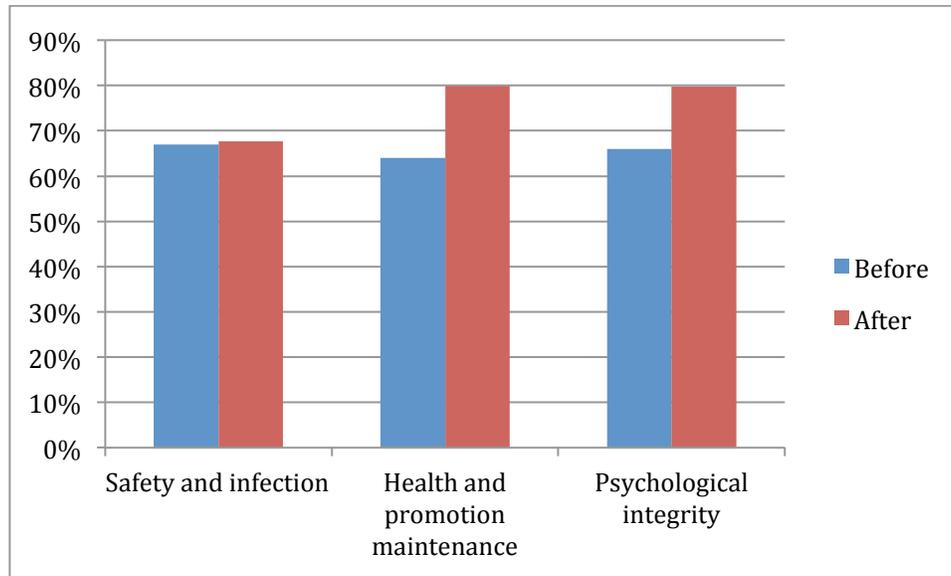
infection control = 67.7%, health and promotion and maintenance = 79.9%, and psychological integrity = 79.7% (Figure 1). (The scores in Figure 1 are after the intervention)

Figure 1: Calculated Means for ATI Exam



Prior to the simulation intervention, the students from three cohorts were: safety and infection control = 67%, health promotion and maintenance = 64%, and psychological integrity = 66%. According to the ATI proctored exam, there was a small increase in knowledge regarding safety and infection control, while showing a significant improvement in the area of health promotion, maintenance and psychological integrity. Figure 1 shows the results of the computerized test after the intervention. Figure 2 compares the before and after simulation intervention outcomes of the ATI computerized proctored exam with the nursing students.

Figure 2: Before and after simulation intervention results



At the end of each debriefing session, students were asked: was the simulation helpful, what was done well, and what area of the simulation needed improvement. Overall the students stated the simulation helped them to analyze appropriate and inappropriate behaviors in the clinical setting. The simulations also allowed them to put themselves in the patient's position. Students verbalized less frustration and anxiety during the simulation because they were not interrupted during the simulation experience by the facilitator. Simulation allowed students to think of various approaches to address scenarios they might encounter in the community health setting.

### Discussion

This quality improvement intervention showed improvement in all three areas of focus on the ATI computerized proctored community health exam. The improvements were as follows: 3% in safety and infection control, 12.9% improvement in health and promotion and maintenance, and 13.7% improvement in psychological integrity. The improvement project

supported the concept that simulation improves knowledge acquisition, advances nursing student learning, expands teaching strategies in nursing programs, and advances the nursing profession. Although the improvements were not statistically outrageous, the obtained information allowed the faculty to develop teaching strategies in the curriculum to improve application of knowledge in the clinical setting.

### **Students' Learning**

This project was instrumental in developing and analyzing simulation teaching and how it affected knowledge retention and improved student learning. The quality improvement project took the lead in developing vital information to develop teaching strategies that produced knowledgeable and competent nurses into the healthcare industry that will impact patient outcomes. Students need more exposure to clinical situations via simulation to will improve better clinical behaviors in the clinical setting while caring for patients. More exposure in the clinical field in any capacity aids in the improvement of appropriate clinical judgments for safer practice to improve patient care. Furthermore, the results satisfy the obligation of doctorate of nursing practice (DNP) graduates to explore, analyze, and implement evidence based practices that can be implemented into any nursing program.

### **Nursing Program**

The outcome of the project will help other nursing programs evaluate and implement simulation techniques that measure the transference of knowledge from theory and skills lab into clinical application. If educators can help students to improve knowledge retention it will increase critical thinking in the clinical area, which ultimately promotes, encourages and supports safe patient care.

**Advancement of the Nursing Profession**

Additional research related to simulation learning was necessary to continue to advance the profession of nurses. Simulation is an ideal situation to allow students to learn, develop, and retain nursing clinical practice. Thus, active learning scenarios for students will ultimately improve patient outcomes and increase nursing knowledge to advance healthcare conclusions.

**Limitations of the project**

A limitation related to the project was the small sample size. Although the sample size was limited, the result of the project was consistent with other studies in which, simulation enhanced critical thinking, promoted confidence, and increased learning in nursing students (Kaddoura, 2010). The project is applicable to the nursing program and nursing students because it was used as a teaching method to improve learning comprehension and retention.

**Conclusion**

Simulation has proven to be an effective teaching method to enhance learning with nurses and nursing students. Simulation addressed an identified need to move theoretical based learning from the classroom to nursing practice. Simulation scenarios aided in knowledge acquisition and retention to help students transfer classroom learning to clinical application. The intervention took the lead in curriculum development to improve student learning at a community college nursing program. It is the responsibility of nurse educators to implement innovative and engaging teaching techniques to improve clinical performance, which ultimately improves patient outcomes.

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## APPENDIX A. STATEMENT OF ORIGINAL WORK

### Academic Honesty Policy

Capella University's Academic Honesty Policy ([3.01.01](#)) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

The following standards for original work and definition of *plagiarism* are discussed in the Policy:

Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)

Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else's ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University's Research Misconduct Policy ([3.03.06](#)) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy:

Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.

**Statement of Original Work and Signature**

I have read, understood, and abided by Capella University's Academic Honesty Policy ([3.01.01](#)) and Research Misconduct Policy ([3.03.06](#)), including the Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA *Publication Manual*.

Learner name  
and date

Cynthia Ashby 8/31/2015

Mentor name  
and school

Dr. JoAnn Manty Capella University