Title:
Evaluating vSim for Nursing®: A Multisite Research Collaboration in Nursing Education

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References:
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Abstract Summary:
Virtual simulation is the next step in utilizing simulation as a teaching pedagogy. This multi-site, mixed-method, quasi-experimental study evaluated the effectiveness and student satisfaction of vSim for Nursing® in an Adult Health Nursing course. Students indicated vSim was effective in understanding course concepts and provided a positive experiential learning experience.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will: 1. Describe the implementation of vSim for Nursing, a virtual simulation program, in an adult health nursing course at multi-sites	Background and framework of the study

2. Examine student outcomes for effectiveness and student satisfaction of vSim for Nursing in an adult health course.	Describe and interpret the results
3. Evaluate the role of collaboration among nurse educators from diverse multi-sites in advancing nursing education	Discuss how the study was conducted with researchers in different regions of the country and implications for nursing education

Abstract Text:

Collaboration for the advancement of nursing education is a cornerstone to meet the learning needs of the ever changing student learner, especially the digital learner. Nurse educators from a northern metropolitan university and a southern state university conducted a study to evaluate a virtual simulation technology platform, vSim for Nursing®. The purpose of this presentation is to review the research study, present the results, and discuss the collaborative process among nurse educators.

The use of simulation has proliferated nursing programs over the course of the last decade and has become an accepted teaching pedagogy (1) Further development of technology based learning has suggested a natural progression of simulation into virtual reality applications as the next forefront for educating nurses and addressing the unique educational needs of digital learners.

With the market inundated with a myriad of technological applications, nurse educators bear a responsibility for vetting the technology and making recommendations for use in nursing curricula. One method of evaluating technology is by conducting research to base recommendations for classroom use. Nurse educators from two undergraduate nursing programs with diversely different settings and student populations conducted a pilot study for the purpose of evaluating the effectiveness and ascertaining student satisfaction of vSim for Nursing®: Medical-Surgical in an Adult Health nursing course. The operational definition of effectiveness for the purpose of this study was student performance on a unit exam and post-sim quiz score.

Virtual simulation is the representation of real life that takes place in a virtual environment via a digital platform permitting the learner to interact with virtual patients.(2) Virtual simulation has been used to teach an array of nursing concepts including: leadership, communication, decision-making, critical thinking, inclusivity, health appraisal, and disaster triage(3,4).

A quasi-experimental, three group, mixed method design was used for this study. A convenience sample of 103 undergraduate nursing students currently enrolled in a second semester adult health course was obtained from two sites (83 female students and 20 male students; age ranges included: 18-21=42, 22-25=47, 26-30=9, 31-40=5). Students were assigned to groups according to their course sections, control group C (n= 35); intervention group 1 S (n= 32); and intervention group 2 NS (n=36). Student groups C and S were from a university located in a rural community within the southeastern United States; group NS was from a college located in an urban area in the northeastern United States.

vSim for Nursing® is an interactive virtual simulation program developed to foster confidence building and readiness to practice in nursing students. Scenarios are embedded in a virtual clinical setting where students interact with patients in a true-to-life and safe environment. Prior to beginning the scenario students take a pre-simulation quiz to assess their knowledge. At the conclusion of the simulation, students take a ten item post-simulation quiz related to the concepts learned through the vSim for Nursing® scenario. Feedback on their performance and access to remediation materials was provided following the post-simulation quiz. vSim scores at the end of each scenario, measuring students' actions in terms of low, moderate and high risk for patient harm. Students can use the program anywhere the internet is available at and repeat the scenario multiple times(5).

In the study, a unit exam was administered in the adult health courses that included five questions related to care of the patient with diabetes. The exam items were generated and standardized using the test bank associated with the current required course text. Student satisfaction of the vSim for Nursing® experience was evaluated using a faculty created eight item questionnaire. The *Student Evaluation of Medical Surgical Nursing vSim for Nursing®* (SEMSNV) is comprised of seven Likert type questions ranging from (1) strongly disagree to (5) strongly agree, and comment section. Face validity was established by the researchers; all three researchers were experienced educators in adult health, one of whom was a certified healthcare simulation educator.

A component of the vSim for Nursing® experience was a ten question post-simulation quiz, which both simulation groups completed at the end vSim experience. As group C did not have access to the vSim for Nursing® scenarios they were provided with a paper pencil version of the quiz, which they took at the conclusion of the lecture on care of the patient with diabetes. As a routine part of the course all students were administered a unit exam that included five questions related to nursing care of the patient with diabetes. The questions were in addition to the regular exam questions and were not used to calculate the student's grade, thus, preventing the simulation groups as compared to the control group from being advantaged or disadvantaged

A one way ANOVA revealed no statistical difference in the unit exam scores between the simulation groups and the non-simulation group, $F(1,100) = 3.184$, $p = .077$, suggesting that vSim for Nursing® was neither an advantage nor disadvantage to students. Post simulation quiz score means were group C 55.31, group S = 59.03, group NS = 58.06 indicating that both simulation groups scored higher than the control group, however, the difference was not statistically significant $F(1,95) = .619$, $p = .433$.

The highest ranked question, with 92% of students agreeing/strongly agreeing, was vSim for Nursing® challenged them to use their knowledge and clinical judgment. Ninety-one percent of students indicated: they would recommend vSim for Nursing® for a tool that was helpful in understanding medical-surgical content; vSim for Nursing® allowed them to learn from their mistakes; vSim for Nursing® for was realistic and beneficial. In relation to ease of navigation, 74% of students agreed/strongly agreed that vSim for Nursing® was straightforward and easy to navigate. This meant approximately 26% of students did not find vSim for Nursing® easy to use, which was surprising based on student narratives. Seventy-six percent of the students agreed/strongly agreed that vSim for Nursing® increased their confidence in caring for real patients.

Group S's v-Sim for Nursing® scores ranged from 14-100% (66.75) and group NS's scores ranged from 18-100% (63.27). In group S, 78% of the students met or exceeded the benchmark of 50%. Sixty-nine percent of group NS met or exceeded the benchmark of 50%.

Students shared that the vSim for Nursing® scenario helped them prepare for clinical practice. Comments included: "I found vSim for Nursing® to be beneficial learning tool that gives needed practice in various clinical settings." "vSim for Nursing®allowed me to be the nurse. It makes me feel confident I can take care of real patients with similar conditions." Other students commented on how vSim for Nursing® allowed for critically thinking. "vSim makes you think critically!" Some students identified that they had difficulty navigating through vSim for Nursing®. "I liked it [vSim for Nursing®] but it is very confusing at first. It would be better if it had a better 'sense of direction.

The quantitative/qualitative student data revealed that students were highly satisfied with this product and was a beneficial tool in terms of (a) increasing understanding of adult health concepts, (b) challenging their knowledge and critical thinking, (c) allowing for reflection and feedback, and (d) realistic environment. While limited research exists regarding vSim for Nursing®, studies which examined the use of other virtual simulation programs also found that knowledge and decision making skills were improved following the experience.

A majority of students believed vSim for Nursing® increased their knowledge of adult health concepts, their clinical judgment, and allowed for feedback as well as realistic and helpful for clinical preparation. These findings indicated the virtual tool may be appropriate for use in the flipped classroom and a s an alternative for clinical activity. Study results indicated students were highly satisfied with vSim for Nursing®, however, the researchers were unable to confirm that vSim for Nursing® was effective as a teaching tool, leaving faculty with unanswered questions regarding the disconnect between the faculty findings and student findings.

Based on the overwhelming positive response by students, vSim for Nursing® warrants further investigation, using other methods to measure effectiveness to ascertain if knowledge acquisition is indeed improved as indicated by students in this study.

The research project offered a unique experience for the nurse educators and could serve as a model for other researchers. Brought together at a Sigma Theta Tau conference, a like interest in simulation and student learning methods planted the seeds for a multisite study. Applying technology tools like Skype and Dropbox, the educators were able to collaborate, develop, implement and craft a research study at two distant locations. The implications for utilizing technology as a means to globally expand scholarly activities are limitless and it broadens the horizon for all nurses to see beyond their own locale.