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Current Literature Summary

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Simulation is a teaching or training technique that is used to replace real patient experiences with intentional, interactive, real-enough virtual patient experiences. Clinical simulation is an effective teaching/training strategy used in medicine, nursing, and other health care professions. Simulation experiences provide opportunities for one to acquire knowledge, confidence, and critical thinking skills in a risk-free, experiential learning environment. We will provide brief synopses of current research on simulation and discuss possible applications to athletic training.

Kaddoura M. New graduate nurses' perceptions of the effects of clinical simulation on their critical thinking, learning, and confidence. *J Contin Educ Nurs.* 2010;41(11):506-516.

Reviewed by Christine A. Lauber, University of Indianapolis

Summary of research context and methods: Nurse educators are challenged to develop critical thinking skills in nursing students that will prepare them to provide safe and effective patient care. According to the American Association of Colleges of Nursing, critical thinking must be integrated into nurse education programs. Hospital-based nurse educators have used clinical simulations as a tool to improve nursing practice, enhance patient safety, present evidence-based practice guidelines, and to promote critical thinking. This exploratory, descriptive study investigated graduate nurses' perceptions of the effect of clinical simulations on their critical thinking skills, learning, and confidence. The clinical simulations were conducted every three weeks for one, 8-hour day (total 8 days, 64 hours) as a component of a 6-month hospital-based critical care training program. The clinical simulations incorporated skill practice on simulated patients and role-play activities. Once the training was complete, a convenient sample of 10 graduates participated in a semi-structured interview.

Summary of research findings: The graduate nurses perceived clinical simulation to develop their critical thinking, leadership, and communication skills as well as provided them with the ability to manage stressful situations. Three main themes emerged from the interviews: (1) just-in-time learning of cognitive and psychomotor skills, (2) fostering of critical thinking and leadership skills through feedback on simulation, and (3) safety in a nonthreatening learning environment. The participants reported that the simulations portrayed real-life patients, helped to develop holistic patient care with other healthcare practitioners, and bridged the gap between theory and practice (theme 1). The participants indicated that their critical thinking skills were enhanced through reflection and video feedback of their performance and that their leadership and teamwork skills were improved as a result of the simulations (theme 2). The participants stated that the simulations promoted patient safety, gave them confidence when providing patient care in a critical situation, and enhanced their ability to manage stress in serious situations.

Implications for athletic training education/research: Clinical simulation is an effective teaching tool for promoting critical thinking, learning, and confidence; therefore, athletic training educators should consider designing and implementing clinical simulation teaching-learning strategies into their curricula. Simulations using high-fidelity manikins, role playing, or standardized patients provide students with the opportunity to develop critical thinking, confidence, and patient care skills in a non-threatening, controlled environment. Additionally, simulations give educators the opportunity to provide immediate feedback to the student thus promoting student reflection of his/her performance. Research in athletic training has begun to address the use of interactive and innovative teaching-learning strategies, such as standardized patients, yet more research is needed to evaluate their effectiveness in developing critical thinking, leadership, and communication skills to enhance clinical practice and patient safety.

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Blum CA, Borglund S, Parcells D. High-fidelity nursing simulation: impact on student self-confidence and clinical competence. *Inter J Nurs Educ Schl.* 2010;7(1): Available at: http://www.bepress.com/ijnes/vol7/iss1/art18. Accessed: March 15, 2011.

Reviewed by Brian J. Hughes, University of Central Missouri

Summary of research context and methods: In the effort to better prepare entry-level nursing students for professional practice, nursing educators are researching new avenues to strengthen their students' future success while in their clinical courses. By incorporating new teaching techniques, such as high-fidelity simulationinto the curricula, nursing educators could examine two important learning characteristics critical to professional practice: self-confidence and clinical competence. The purpose of this study was to determine (1) if student ratings of self-confidence and faculty ratings of student competence correlate between midterm and final assessment and (2) if enrollment in a traditional or simulated-enhanced laboratory course impacts student self-confidence and clinical competence.

Fifty-three entry-level Bachelor of Science nursing students in their junior year of education participated in this study. The final sample of students were predominantly female (n=47, 89%), Caucasian (n=36, 68%), and non-traditional (mean age=30, SD=9.63). Using a quasi-experimental study design, student self-confidence and clinical competence were observed in the control group (n=16) using traditional teaching methodologies and the experimental group (n=37) using the Laerdal's SimMan® high-fidelity manikin. Both participants and instructors utilized the Lasater Clinical Judgment Rubric (LCJR) at the semester mid-term and final to assess perceived levels of student self-confidence and clinical competence. The four levels of development used as descriptors in the LCJR included: (1) Beginning, (2) Developing, (3) Accomplished, and (4) Exemplary.

Summary of research findings: The LCJR had good reliability for assessing student self-confidence and clinical competence. Self-confidence and clinical competence also improved significantly in both the control and experimental groups from midterm to final. Crosstabulations revealed that 27 students rated their self-confidence "exemplary" in the final assessment as compared to 16 at midterm and that 38 students rated themselves "exemplary" in clinical competence at final assessment as compared to 16 students at midterm. Participants in the control group had a greater increase in both self-confidence and clinical competence scores from midterm to final as compared to the experimental group. The lack of statistical significance across groups suggests the student self-confidence and clinical competence improved regardless of the mode of teaching.

Implications for athletic training education/research: In the field of athletic training, athletic training educators are constantly seeking new and innovative methods to better educate and prepare entry-level athletic training students prior to their professional practice. As a possible method of ensuring a greater sense of self-confidence and clinical competence, high-fidelity simulation has the potential of accomplishing this in a controlled environment before skills are transferred to professional clinical application. As described in this article, high-fidelity simulation can be used in several clinical aspects of the curriculum including the novice learning of basic of skills to the advanced refinement of complicated skills. Athletic training educators should consider more research and the potential implementation of high-fidelity simulation models in the clinical aspect of the curriculum as another avenue to increase student self-confidence and clinical competence.

Schlairet MC, Pollock JW. Equivalence testing of traditional and simulated clinical experiences: undergraduate nursing students' knowledge acquisition. *J Nurs Educ.* 2010;40(1):43-7.

Reviewed by Gianluca Del Rossi, University of South Florida

Summary of research context and methods: As educational programs struggle with faculty shortages, increasing student enrollment, patient safety concerns, and the decreasing number of clinical instructors and clinical sites, educators have begun to incorporate human patient simulators to overcome these barriers. By using human patient simulators, undergraduate students are able to engage in realistic clinical environments or situations that are tailored to their specific educational needs. Replicating what students may be exposed to in clinical practice allows students to refine their psychomotor skills, as well as their decision-making process, without the fear of causing harm to patients. Although the literature describes a number of positive outcomes associated with the use of simulation in clinical education, the benefits of this teaching method over traditional clinical experiences are lacking. Therefore, in this study, researchers compared the acquisition of nursing fundamentals following traditional and simulated clinical experiences. They also evaluated whether the sequential order in which these methods are introduced to the student might impact the student's overall knowledge gains should both methods be used in succession.

Summary of research findings: In this study, a 100-point knowledge test was created to capture quantitative data. Tests were administered before the intervention (knowledge pretest) and following the intervention (post-test 1). All participants then crossed over into the opposite intervention arm and completed the final test (post-test 2). Statistical tests revealed significant knowledge gain following both simulated and traditional experiences. The data revealed significant test score differences in both study groups from pretest to post-test 1; post-test 1 to post-test 2; and pre-test to post-test 2. Additionally, there were no statistically significant differences for intervention sequences (simulated-traditional and traditional-simulated).

Implications for athletic training education/research: Based on the findings of this investigation, it appears that simulated clinical experiences using high-fidelity simulators may be beneficial to student learning, particularly in those situations when access to traditional patient care settings are limited or when patients with specific clinical conditions are not available. However, educators should keep in mind that simulation learning cannot meet the needs of all learners, thus, before this type of teaching strategy is integrated within a student's learning environment, the role of simulation within the educational program needs to be delineated. For example, when teaching some clinical skills it may be necessary to introduce simulation only as an adjunct to traditional methods, whereas with other skills this teaching strategy may replace altogether the traditional methods of instruction. This will ensure that students continue to have well rounded clinical experiences and meet core educational competencies.

Additionally, before simulation experiences are incorporated

within athletic training curricula, more research is necessary to determine whether the knowledge acquired via simulation actually helps the student achieve clinical competence, and whether that competence can then be transferred from a simulated setting to a real clinical environment. Finally, it would be helpful to establish some of the secondary benefits of simulation (such as the potential for this educational technology to increase a student's confidence or comfort level when delivering patient care) in order to provide further support for integrating this teaching strategy within an athletic training education program.

Elfrink VL, Kirkpatrick B, Nininger J, Schubert C. Using learning outcomes to inform teaching practices in human patient simulation. *Nurs Educ Perspectives*. 2010;31(2):97-100.

Reviewed by Eva Frank, Florida International University

Summary of research context and methods: Nurse educators are challenged to prepare competent practitioners despite reduced clinical sites, nursing faculty, and clinical supervisors. In an effort to meet this challenge, nurse educators are implementing innovative teaching strategies, such as human patient simulations, to efficiently achieve clinical learning outcomes in a safe environment. Human patient simulation meets the criteria of pedagogical situated learning in that it gives the student an opportunity to apply their knowledge (content) in an interactive scenario (context) while working with others in a common learning environment (community) in which exchange of knowledge (participation) occurs. Additionally, human patient simulation involves the mastery learning approach in which the learner is presented with a scenario, they are taught a number of strategies to successfully complete the scenario, and they are coached through the experience, evaluated on their achieved learning, and provided with a summary to establish scenario closure.

The purpose of this study was to assess students' knowledge acquisition and retention following a human patient simulation experience. Using situated and mastery learning as a framework, the researchers developed human patient simulation scenarios to evaluate nursing students' knowledge before (pretest) and after (posttest 1) the simulation, and again at the end of the academic term (posttest 2). Knowledge was assessed using NCLEX-RN study questions relevant to the human patient simulation.

Summary of research findings: Students performance improved significantly from pretest to posttest 1 suggesting that knowledge was acquired; however, the data revealed that knowledge was retained (posttest 2) by only 50% of the students.

Implications for athletic training education/research: Human patient simulation is gaining increased popularity in nursing curricula to promote clinical learning. This study found that human patient simulation is beneficial to students' knowledge acquisition if the instructor is trained in giving appropriate pre-simulation instructions and cues. Integrating human patient simulation into athletic training curricula may be beneficial as it allows for increased exposure to different, and perhaps rare, illnesses and injuries. Practicing with human patient simulators will give athletic training students multiple opportunities to correct and refine their clinical skills following feedback from the instructor. Since the instructions and cues given by the educator are so essential, athletic training educators would need proper simulation training prior to implementing this teaching strategy into the curricula. Further research is needed to examine students' knowledge retention following simulation and the impact of instructors' simulation teaching experience on learning outcomes.

Kaplan B, Ura D. Use of multiple patient simulators to enhance prioritizing and delegating skills for senior nursing students. *J Nurs Educ.* 2010;49(7):371-7.

Reviewed by Jennifer L. Doherty-Restrepo, Florida International University

Summary of research context and methods: Providing nursing students with clinical experiences that foster the development of leadership skills in prioritizing and delegating care is difficult. While in the clinical setting, nursing students focus on becoming proficient at patient care skills. However, upon entering the profession, nursing students are expected to transition to a practicing nurse capable of implementing advanced leadership skills to effectively care for numerous patients simultaneously. Simulation-based learning (SBL) is an effective teaching strategy that allows nursing educators to create scenarios that require students to utilize advanced skills, such as leadership, to care for simulated patients. In this study, nursing educators created a SBL experience for 97 students to assess their ability to safely and effectively prioritize, delegate, and implement care for three patient simulators.

Summary of research findings: Sixty-nine percent (n=67) of nursing students reported that the SBL experience increased their understanding of how to prioritize and delegate care. Seventy-eight percent (n=76) of nursing students reported increased confidence in working with teams and 55% (n=52) reported increased confidence in prioritizing and delegating care.

Implications for athletic training education/research: This study suggests that SBL experiences may be an effective teaching strategy to develop student confidence in working with teams and critical thinking skills, such as prioritizing and delegating care. Similar to nursing, athletic training students are expected to transition from a student to an autonomous clinician. The development of critical thinking skills and confidence in athletic training students can be a challenge due to clinical supervision requirements; however, these skills are essential for the autonomous clinician. Research on critical thinking skills and confidence of athletic training students following SBL experiences is warranted. Additionally, research on the transfer of these skills from the simulated to the clinical setting is needed.