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Short Communication

Simulations in the Classroom: An Innovative Active Learning Experience

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KEYWORDS
nursing education;
active learning;
simulation;
classroom;
adult health

Abstract
Background: Simulation is a common active learning strategy. Although simulation is popular for its effectiveness in the clinical setting, its use in the classroom has been underreported. This article describes classroom activities using simulation and explores its impact on student knowledge and perceptions.
Methods: Third-year baccalaureate nursing students enrolled in an adult health alterations course participated in the study. Classroom simulations were performed in a lecture hall and were designed to engage students in the transfer of theory to practice. Semesters with and without the inclusion of simulations were compared.
Results: Students enrolled in semesters that included simulations performed better on quizzes and the first examination and perceived the learning environment to be more student centered, felt more autonomous, competent and connected to the class, and were more motivated.
Conclusion: Incorporating simulations in the classroom can be an effective way to improve student knowledge and perceptions of the learning environment.

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Background

Students learn best when they actively participate in the learning process. By engaging students in their learning, educators can nurture a deeper understanding of the material and assist students to perform high-order thinking, such as applying information (Shin, Sok, Hyun, & Kim, 2015). Simulation, a form of experiential learning, is an educational strategy that allows students to be engaged through real-life application of theory to practice. Simulation-based learning provides an opportunity for learners to practice skills, improve competency, and deliberately practice high-risk scenarios in a safe environment without the fear of mistakes (Shin et al., 2015).

Although evidence supports the use of simulation in nursing curriculum, the majority of studies examine simulation performed in a laboratory setting as a substitute

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for clinical experiences (Gates, Parr, & Hughen, 2012; Harder, 2010; Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014; Yuan, Williams, Fang, & Hong Ye, 2012). There are few examples of simulation activities used in the classroom. One study used high-fidelity simulations that were prerecorded and passively viewed by the students in class then debriefed (Zulkowsky, 2010). Results revealed that students preferred the traditional case study lectures to the prerecorded simulation scenarios viewed in class. Another study by Rode, Callihan, and Barnes (2016) incorporated hands-on simulation in the classroom with four students performing simulation in front of the class while the rest of the class observed. Although findings demonstrated improved knowledge retention on content covered by these simulations, Shearer (2016) found that performing in front of faculty and peers produces anxiety in students and affects performance.

Key Points
- Simulation in the classroom.
- Active learning environment.
- Student centered learning.

Given the success of small groups in the simulation laboratory setting, it may be beneficial to divide a large classroom of students into small groups each participating in simulation at the same time. This prevents students from passively sitting while either viewing videos or watching a handful of students perform on stage. This strategy increases the number of students that are actively engaged in the activity and may improve student knowledge and student perceptions. The purpose of this research study was to evaluate the effectiveness of simulations in a large classroom setting on students' (a) knowledge and (b) perceptions of the learning climate in terms of autonomy, competence, relatedness, and motivation.

Methods

Sample

The course enrolls approximately 50 baccalaureate nursing students per semester who have already completed the prerequisite foundational science and nursing courses and are in their third year of a four-year nursing program. Participants comprised 199 students (93.5% female). The students ranged in age from 20 to 47 with an average age of 22.14 ($SD = 3.00$). The majority of students were White (92.0%), followed by Hispanic/Latino (3.5%), mixed race (2.5%), Asian (1.5%) and Native Hawaiian/Pacific Islander (0.5%). Students in the Fall 2013 and Spring 2014 semesters ($n = 94$) participated in the traditional lecture course, whereas those in the Fall 2014 and Spring 2015 semesters ($n = 105$) participated in the course with simulation. Based on student demographic data acquired from the registrar's office, there were no statistical differences in grade point average, age, gender, or ethnicity between students in the course that included simulation and the course that did not include simulation.

Intervention

The medical–surgical faculty at a Midwestern university in a 300-level adult health alterations course replaced 20% of traditional case study lectures with classroom simulation activities. Simulations were created by faculty following the Jeffries, Rodgers, and Adamson (2015) theory for designing, implementing, and evaluating simulations and were created to enhance key course concepts. Didactic material was presented in each of five units using a sequence of three to four traditional case study lectures followed by one simulation day and then a unit examination. The traditional two-hour lecture format used a Microsoft PowerPoint presentation and case studies with embedded audience response questions. Unit three was the only section that did not contain a simulation due to the preference of the instructor teaching the content. Unit one included two simulations.

Simulation days occurred in the classroom, and all students in the course were encouraged to attend. Simulation scenarios were created by the medical–surgical faculty to correlate with the unit content and the course learning objectives. Examples of some simulation topics covered during the semester included (a) postoperative complications, specifically atelectasis, opioid overdose, hypovolemic shock, and evisceration; (b) blood administration and transfusion reactions; (c) colostomy care; and (d) management of hyperkalemia. The cohort was divided into small groups consisting of seven to eight students per group, and groups were assigned based on clinical placement in the course to cultivate trust. Within each small group, members were appointed to various roles depending on the simulation scenario, for example, two nurses, one standardized patient, one family member, one provider, and two to three observers. Each small group simultaneously worked through the simulation scenarios for about 20 to 30 minutes. A 30-minute debriefing session immediately followed with all students together. The same patient was then followed into a second scenario. Students switched roles within their small groups, which allowed all students to participate in an active role during the class time, and a second debriefing occurred afterwards.

Students were graded on their professionalism (e.g., respect, preparedness, punctuality, teamwork, and attitude) and active participation. Prior to class, learners were responsible for all prior classroom instruction leading up to the simulation including preceding lectures, supplemental reading, and assigned videos within the corresponding unit. Each session began with a review of the case. Students were expected to review the history, assess the patient, make clinical decisions, implement interventions, and collaborate with members of the health care team. Active participants were tasked with working together to apply solutions thereby