Clinical Simulation in Nursing (2016) 12, 251-259

Clinical Simulation in Nursing

www.elsevier.com/locate/ecsn

Featured Article

Assessing the Value of Large-Group Simulation in the Classroom

Jennifer L. Rode, PhD[a,*], Michael L. Callihan, MSN[b], Brenda L. Barnes, MSN[a]

[a]*Department of Nursing, Miami University—Hamilton Campus, Hamilton, OH 45011-3399, USA*
[b]*Department of Nursing, Miami University—Middletown Campus, Middletown, OH 45042, USA*

KEYWORDS
high-fidelity simulation;
retention;
large group;
nursing education;
vicarious learning;
active-teaching strategies

Abstract

Background: Evidence suggests that human patient simulation can dramatically enhance nursing education; however, educators face substantial time barriers to facilitate multiple simulation experiences into their curriculum.

Method: Using quasi-experimental design, the intervention group (n = 29) received eight large-group simulations in place of lecture, whereas the control group (n = 31) received traditional teaching strategies.

Results: A one-way between-group multivariate analysis of covariance revealed statistically significant differences, whereby students who received the intervention performed significantly better ($p = .01$) on knowledge retention—related simulation content, whereas there were no differences in knowledge retention between intervention and control groups on nonsimulation content. Within the intervention group, differences in participants' and observers' knowledge retention levels were not statistically significant.

Conclusions: The results of this pilot study support large-group simulation as an effective alternative to lecture. This may allow for increased integration of simulation within nursing curricula.

Cite this article:
Rode, J. L., Callihan, M. L., & Barnes, B. L. (2016, July). Assessing the value of large-group simulation in the classroom. *Clinical Simulation in Nursing, 12*(7), 251-259. http://dx.doi.org/10.1016/j.ecns.2016.02.012.

High-fidelity human patient simulation (HPS) is an educational strategy that provides learners with exposure to realistic clinical situations using life-like examples and allows them to practice psychomotor and critical thinking skills in a safe environment. Evidence strongly supports its contributions to affective, cognitive, and psychomotor learning outcomes (Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010; Liaw, Scherpbier, Rethans, & Klainin-Yobas, 2012). Although these findings suggest that HPS could dramatically enhance nursing education, educators face substantial barriers to fully integrating HPS into their curriculum. One of the biggest obstacles to HPS integration is time (Adamson, 2010). Development of HPS scenarios can take hours, and time devoted to facilitating small-group HPS experiences, defined as 30-60 minutes experiences and debriefing with three to four students and one to two faculty, may become overwhelming for large classes. It remains unclear how nurse educators can feasibly integrate simulation into their curricula without substantially diverting resources from other learning activities and faculty responsibilities. The authors developed and implemented

* Corresponding author: rodejL@miamioh.edu (J. L. Rode).

1876-1399/$ - see front matter
http://dx.doi.org/10.1016/j.ecns.2016.02.012

an innovative large-group simulation in which an entire cohort (n = 29) simultaneously participate in or observe a HPS simulation and debriefing lasting approximately 1 hour. This strategy decreased the time required for small-group HPS sessions. Results from this intervention document knowledge retention compared with traditional teaching methods. Further analysis examined the effects of this strategy for both active participants and vicarious learners who observed the high-fidelity HPS experience.

Key Points

- Vicarious learners benefit from observing simulations.
- Large-group simulations resulted in better knowledge retention than lecture.
- "The BEST learning experience EVER!!"

Human Patient Simulation Knowledge Retention

Evidence supports the value of HPS with multiple outcomes, including affective, cognitive, and psychomotor domains of learning (Aura, Sormunen, Jordan, Tossavainen, & Turunen, 2015; Cook et al., 2013; Shin, Park, & Kim, 2015). However, scant evidence measures knowledge retention from HPS. Research has generally focused on post-test outcomes, immediately after simulation and/or subjective outcomes, including team building, problem-solving, critical thinking, and students' self-report of confidence (Fisher & King, 2013; Lapkin, et al., 2010). Much of the evidence of knowledge retention focuses on high-fidelity simulation with advanced cardiovascular life support or basic life support (BLS) training with inconsistent results. The addition of high-fidelity simulation to traditional BLS or Pediatric Emergency Assessment, Recognition, and Stabilization had significant benefits in knowledge retention (Ackermann, 2009; Bultas, Hassler, Ercole, & Rea, 2014; Aqel & Ahmad, 2014). However, others found no statistically significant differences in knowledge retention for BLS, advanced cardiovascular life support, or paper-pencil cases studies when compared with teaching with high-fidelity simulation (Akhu-Zaheya, Gharaibeh & Alostaz, 2013; Lo et al., 2011; Couto, Farhat, Geis, & Schvartsman, 2015). All these studies' evaluations of knowledge retention were conducted with small-group simulation interventions. Evidence of knowledge retention in large-group simulations was not found.

Human Patient Simulation Time Investment

Traditionally implemented with small groups (three to five students), HPS development and facilitation time can be considerable (Adamson, 2010). A typical small-group HPS with a class of 50 students could necessitate 10-16 hours of faculty facilitation time, in addition to existing didactic hours. Each hour of faculty time must be diverted from other responsibilities. Time constraints may result in minimal HPS experiences each semester. Yet, limiting HPS experiences lessens the potential learning opportunities and outcomes for students that HPS research demonstrates.

There is scant support for an efficient and effective option for large cohorts of students or for multiple simulations within one course. A simulation week, in which faculty cancels all classes and students sign up for simulation times, is one option that faculty has used to integrate simulation (Rochester et al., 2012). This may reduce didactic time, as faculty members are needed to run the simulations that students attend during class time. Another creative strategy incorporated HPS in a large-group (52 students) setting with 2-minute drills, in which groups of four students rotated through an evolving simulation until all students have participated in the simulation (Norman, Thompson, & Missildine, 2013). Although students reported positive feedback from this strategy, objective learning outcomes were not tested; therefore, it is uncertain if this strategy demonstrates equivalent or improved learning outcomes.

Brannan, White, and Bezanson (2008) went further to incorporate an acute myocardial infarction high-fidelity simulation experience into a didactic course. They compared a traditional lecture format with a connected series of five active-learning stations, including one high-fidelity small-group simulation experience. Post-tests revealed that the group that received the high-fidelity experience performed significantly better than the group that received a traditional lecture ($p = .002$). However, a more recent study with similar procedures found that students who received traditional lectures demonstrated significantly better post-test knowledge outcomes than those who experienced only small-group high-fidelity simulation ($p = .03$; White, Brannan, Long, & Kruszka, 2013). Knowledge retention was not measured in either of these studies. Most recently, a series of large-group simulations was tested in a med–surg nursing course (Hooper, Shaw, & Zamzam, 2015). Results were dismal, as only 16% of post-test scores were significantly improved.

With the exception of the studies mentioned previously, the vast majority of literature examines simulation in a small-group setting. Small groups provide excellent opportunities for students to apply their skills and increase their confidence. However, high-fidelity HPS may offer other opportunities for learning beyond a small-group setting. Large-group HPS may be beneficial for student participants and student observers.

Vicarious Learners

The social learning theory by Bandura (1977) proposes that learning can occur by observing others. More specifically, Bandura suggests that an observed behavior outcome can