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Patient safety and simulation in prelicensure nursing education: An integrative review

Janeen Berndt DNP, RN, CNE*

Saint Mary's College, Notre Dame, IN 46556-5001, USA

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Abstract The Institute of Medicine (2003) called for healthcare educational reform to emphasize patient safety. The Quality and Safety Education for Nurses (2011) initiative responded to the call and defined quality and safety competencies and knowledge, skills, and attitudes necessary to achieve the competencies. The purpose of this review is to synthesize the evidence of simulation to teach safety in nursing education. The final appraisal included 17 articles. The evidence supports the use of simulation to teach patient safety competencies.

Nurses are the most likely health care professional to recognize, interrupt, and correct potentially life-threatening errors in patient care (Chenot & Daniel, 2010). However, routine assessment of patient safety as part of daily practice is not included in nursing education. Nurses are not adequately prepared to provide the highest level of safety and quality (Chenot & Daniel, 2010). Today's nursing graduates must be prepared to place patient safety and quality at the forefront of their practice. Patient safety must be included in educational curricula and practice prior to graduation. The purpose of this integrative review is to synthesize the evidence on the use of simulation as an educational intervention to teach safety competencies in prelicensure nursing education.

1. Quality, safety, and simulation

The Institute of Medicine (IOM, 2003) called for educational reform for health professionals emphasizing patient safety skills, such as identifying errors and hazards in care, and basic safety principles, such as standardization and simplification. The IOM identified five competencies necessary for health professionals: quality and safety, patient-centered care, evidence-based practice, teamwork and collaboration, and informatics. The Quality and Safety Education in Nursing (QSEN) initiative responded to the call for reform and defined the quality and safety competencies as they relate to nursing and identified knowledge, skills, and attitudes (KSAs) necessary to achieve the competencies (QSEN, 2011). The QSEN initiative organized the competencies into six domains and identified associated KSAs with each domain for prelicensure and graduate nursing education (QSEN, 2011).

In order to achieve safety competence in prelicensure students, nurse educators must use educational interventions to reinforce applicable KSAs (Durham & Sherwood, 2008). Simulation is one educational intervention that can be implemented to accomplish this (Durham & Sherwood, 2008; Ironside, Jeffries, & Martin, 2009). The ultimate goal of high-fidelity simulation is to expose prelicensure nursing students to similar situations found in practice. The nurse who has been thoroughly prepared through simulation reduces the chances that an error will occur (Strouse, 2010).

* Corresponding author. Tel.: +1 574 284 4688.
E-mail address: jberndt@saintmarys.edu

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The importance of learning in a simulated environment and the effectiveness of simulation have been supported throughout the literature (Lapkin, Fernandez, Levett-Jones, & Bellchambers, 2010; Laschinger et al., 2008; Robertson & Bandali, 2008). Organizations such as The Joint Commission, the Institute of Healthcare Improvement, and the Agency for Healthcare Research and Quality now recognize and recommend simulation (Strouse, 2010). The IOM also recommends the use of simulation to improve patient safety (Strouse, 2010). However, Sullivan, Hirst, and Cronenwett (2009) investigated prelicensure student perceptions about the extent to which they had acquired the necessary KSAs during their education. The authors found that few students reported that faculty used simulation to teach the KSAs. This integrative review will critically analyze the evidence on the use of simulation as an educational intervention to teach patient safety competency.

2. Method

A review of the literature was conducted using the following databases: Cumulative Index of Nursing and Allied Health Literature (CINAHL), Educational Resources Information Center (ERIC), Medline, and Joanna Briggs Institute (JBI). These databases were selected for this review because they include peer-reviewed scientific journals that pertain to nursing and nursing education.

2.1. Inclusion and exclusion criteria

In order to focus the review on the use of simulation to teach patient safety in prelicensure nursing education, inclusion and exclusion criteria were established. Inclusion criteria for the search included prelicensure nursing education, patient simulation, patient safety, and safety management. Articles involving baccalaureate, associate, and diploma nursing programs were included. Only articles in the English language were reviewed.

Articles that pertained to staff development, medical education, and graduate nursing education rather than prelicensure nursing education were excluded from the review. Other exclusion criteria were computer simulation, conference proceedings, and editorials.

3. Results and review process

A research librarian was consulted to assist with the literature search. The results of a search with the word *simulation* were too broad for this review; therefore, a Boolean search was conducted with the term *AND*. Keywords utilized were *nursing education AND QSEN AND patient safety* and *patient simulation AND safety*. The search continued until duplication of references was achieved.

The selected databases were searched using the identified key words. The search using the terms *nursing education AND QSEN AND patient safety* yielded 25 articles in CINAHL and 8 in Medline. The search using the terms *patient simulation safety* yielded 10 articles in CINAHL, 25 in Medline, 3 in JBI, and 3 in ERIC. Abstracts of the identified articles were reviewed for the inclusion and exclusion criteria, and full text copies of relevant articles were obtained and examined. Duplicate articles were removed. A hand search of the relevant articles was conducted on literature published from 2003 to 2011. The year 2003 was selected because the keyword search did not recover any references prior to that year.

Ultimately, 17 articles were obtained for critical appraisal using the Rating System for the Hierarchy of Evidence (Melnyk and Fineout-Overholt, 2005, see Table 1). The data from the articles were placed in a matrix constructed in Microsoft Excel. The matrix was examined for concepts related to patient safety and simulation in prelicensure nursing education. The concepts were listed in a chart for further synthesis (see Table 2).

4. Discussion

The purpose of the appraisal of the evidence was to examine the effectiveness of simulation as an educational intervention to improve patient safety competencies. The characteristics of each study are detailed in Table 2. Thirteen studies investigated simulation as an educational intervention (Cant & Cooper, 2009; Decker, 2007; Gantt & Webb-Corbett, 2010; Henneman et al., 2010; Ironside et al., 2009; Lapkin et al., 2010; Laschinger et al., 2008; Miller & LaFramboise, 2009; Nehring, 2008; Radhakrishnan et al., 2007; Sears, Goldsworthy, & Goodman, 2010; Traynor, Gallagher, Martin, & Smyth, 2010; Walker, 2008). Five studies examined simulation with the outcome of improved patient safety (Gantt & Webb-Corbett, 2010; Henneman et al., 2010; Ironside et al., 2009; Sears et al., 2010). Two studies evaluated students' reported self-perception of the impact of simulation on knowledge and skills (Traynor et al., 2010; Walker, 2008). One case-control study compared clinical performance of students who practiced with a human patient simulator (HPS) with the clinical performance of students who did not practice with an HPS (Radhakrishnan et al., 2007). One study explored the critical and reflective thinking processes used by students during and immediately after simulation. One researcher explored the current regulations regarding use of simulation (Decker, 2007). There were three systematic reviews on simulation (Cant & Cooper, 2009; Laschinger et al., 2008).

The review included eight studies focused on patient safety in nursing (Attree, Cooke, & Wakefield, 2008; Barton, Armstrong, Preheim, Gelmon, & Andrus, 2009; Chenot & Daniel, 2010; Gantt & Webb-Corbett, 2010; Henneman et al., 2010; Ironside et al., 2009; Ridley, 2008; Sears et al., 2010.). Three studies explored patient safety competencies in nursing curricula across the United States (Attree et al., 2008;