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# Simulation in associate degree nursing education: A literature review

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**Abstract** The use of simulation in nursing education is increasing in scope and popularity. Many undergraduate nursing programs have adopted high-fidelity patient simulation as an educational tool. The effect of simulation on teaching and learning is the focus of current research. The aim of this literature review is to synthesize the research findings evaluating simulation specifically in associate degree nursing education. The results of the review identified the following themes: critical thinking, clinical skill performance, knowledge acquisition, student satisfaction, self-confidence, and anxiety. Gaps in the literature are highlighted, implications for nursing education are explored, and recommendations for further research are provided.


## 1. Introduction

The use of high-fidelity patient simulation (HFPS) is increasing in all types of undergraduate nursing education. Its prevalence has been presented in the National Council of State Boards of Nursing (NCSBN) National Survey (NCSBN, n.d.). Associate degree nursing (ADN) programs across the United States have reported the use of high- and medium-fidelity simulators in their program, and 54% of the survey respondents are using simulation throughout their nursing curriculum (Hayden, 2010). However, there is little research devoted specifically to ADN and simulation. This is of major concern because ADN programs comprise the majority of programs in the United States. The National League for Nursing (NLN) RN program statistics reports that, in 2012, there were 1,084 associate degree programs, 696 baccalaureate programs, and 59 diploma programs in the United States (NLN, 2013). "Associate Degree Nursing (ADN) faculty is challenged by the monumental responsibility of preparing students to function as safe, professional nurses in a two year course of study" (Miller, Leadingham, & Vance, 2010, p. 37). Integrating simulation into the curriculum of ADN programs can present many challenges, and further research is needed in order to optimize the integration and use of HFPS in nursing education (Adamson, 2010; Irwin, 2011). Many nurse educators struggle with how to evaluate the effectiveness of simulation within the curriculum and assess students. Evaluation of the effectiveness of simulation as a teaching tool and its effect on learning outcomes needs to be the focus of continued research (Foronda, Liu, & Bauman, 2013).

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## 2. Definitions

Simulation is defined according to the level of fidelity of the manikin or scenario. HFPS uses a full-body simulator that can be programmed to respond to psychomotor and affective changes, such as SimMan®, METIman®, and Noelle®. Medium-fidelity simulation uses a full-body simulator with installed human qualities such as breath sounds: VitalSim™ is an example (Hayden, 2010, p. 52). ADN program refers to a program of instruction that requires 2–3 years of college academic work, generally within a junior or community college, the completion of which results in an associate degree with a major in nursing and eligibility to apply for licensure as a registered nurse (www.iconsdata.org).

## 3. Background

Simulation is not new to nursing education. In 1911, Mrs. Chase became the first life-size mannequin for nursing students to practice their skills, and low-fidelity simulators or task trainers have been used in nursing education since the 1950s (Nehring & Lashley, 2010). In the 1960s, nursing students used Resusci Anne® cardiopulmonary resuscitation (CPR) trainers. In the 1980s, anesthesia simulators were used for medical education and graduate nursing anesthesia programs. In the year 2000, with the debut of the SimMan®, the use of high-fidelity simulation began to sprout within nursing education (www.laerdal.com).

The 2010 Institute of Medicine (IOM) report, *The Future of Nursing*: *Leading Change*, *Advancing Health*, recommends incorporation of technology, including high-fidelity simulation, in nursing education (IOM, 2011). In the Carnegie Foundation for the Advancement of Teaching Nursing Study, Benner revealed that a significant gap exists between current nursing practice and the education of nurses for that practice (Benner, Sutphen, & Day, 2010). Simulation may be one of the new educational tools that can narrow that gap (Shinnick, Woo, & Mentes, 2011).

## 4. Literature review

Limited research is available devoted to the use of simulation in ADN programs. Because of this gap in academic journals, most of the studies were located in doctoral dissertations. The types of studies found in the literature included quantitative descriptive studies, mixed method studies, quasi-experimental, and retrospective quantitative research. Qualitative studies were prevalent in the academic journals. Many journal articles were descriptions of simulation projects or recommendations for teaching strategies (Irwin, 2011; Wolfgram & Quinn, 2012). A few studies included both bachelor of science in nursing (BSN) and ADN students as research participants.

### 4.1. Search engines and sources

The aim of the systematic review was to search the literature that included research on ADN programs and HFPS. The electronic databases used were Cumulative Index to Nursing (CINAHL), Academic Search Premier, Education Resources Information Center (ERIC), Health Source: Nursing/Academic Edition, Medline, Psycharticles, Proquest, and Science Direct. The selected databases included studies found in peer-reviewed nursing journals, reviews, abstracts, full-text articles, theses, and dissertations. Search parameters included the years 2010–2013, so the most recent literature could be reviewed. Search criteria were further limited to peer-reviewed research articles in English.

CINAHL, Academic Search Premier, ERIC, Health Source: Nursing/Academic Edition, Medline, and Psycharticles produced 55 references when the Boolean terms *simulation* and *associate degree nursing* in the title were used. Science Direct produced 54 articles using the same terms. ProQuest Dissertations & Theses Full Text produced 12 references.

### 4.2. Range of perspectives

Literature chosen from the search included studies of ADN students or programs and use of medium or high-fidelity simulation. Virtual simulation and patient actor studies were excluded. The studies chosen included 13 quantitative, including two retrospective and three quasi-experimental methods, three qualitative, and two mixed-methods studies. Nine studies were chosen from academic journals and 12 from dissertation and theses abstracts. Sample sizes ranged from 20 to 187 for individual studies and 354 for a multisite study. Participants included undergraduate ADN students and a combination of ADN and BSN students for the multisite studies.

## 5. Summary of findings

The research reviewed provides evidence that falls into the following themes: critical thinking skills, clinical skill performance, knowledge acquisition, student satisfaction and self-confidence, and student anxiety.

### 5.1. Critical thinking

Fascione, Fascione, and Sanchez (1994) define critical thinking as the process of purposeful, self-regulatory judgment; an interactive and reflective reasoning process that develops over time. Martin (2002) describes critical thinking as the thought process used by nurses for clinical decision making and states that critical thinking increases with higher levels of clinical experience. Five recent studies assessed the effects of HFPS on critical thinking skills of ADN students (Beebe, 2012; Goodstone et al., 2013; Melenovich, 2012; Rome, 2012; Spencer, 2011). Goodstone