Simulation in nursing education: An evaluation of students' outcomes at their first clinical practice combined with simulations

Rabia Khalaila *

Nursing Department, Zefat Academic College, 11 Jerusalem St., P.O.B. 169, Zefat 13206, Israel

SUMMARY

Background: Nursing students frequently report feeling anxiety prior to entering their first clinical setting. Education through simulations reduces the anxiety level of nursing students and contributes to various outcomes for students' learning processes.
Objectives: The purpose of this study was twofold: to evaluate the effectiveness of simulations in reducing anxiety and promoting self-confidence, caring ability, and satisfaction with simulation; and to investigate the predictors and mediators for caring efficacy among nursing students. The authors examined concepts that have been studied only minimally in the literature.
Design: A descriptive quantitative study.
Setting: Zefat Academic College, Nursing Department, Zefat, Israel.
Participants: 61 second-year nursing students at their first clinical practice.
Method: Data was collected before the first clinical and simulations practice (T1), and four months later (T2) after they had finished their first clinical practice in a hospital setting. Hierarchical linear regression was applied to examine the research hypotheses.
Results: The results revealed that anxiety scores decreased, while self-confidence and caring ability scores increased after using simulations. Caring efficacy was negatively predicted by anxiety, and positively with self-confidence, caring ability and satisfaction with simulation.
Conclusions: The use of simulations before and during nursing students' first clinical practice is a useful and effective learning strategy. Nursing educators should be aware of the high level of anxiety among nursing students during their first clinical practice, and design a program to reduce the anxiety through simulations.

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Introduction

Quality and Safety Education for Nurses (QSEN) addresses the nursing competencies needed to ensure the quality and safety of patient care. Adapted from the Institute of Medicine (IOM) competencies for nursing (2003), QSEN outlines the essential features of competent nursing practice (nursing competencies) to improve patient safety and quality in healthcare settings. The six QSEN competencies are: patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics (Cronenwett et al., 2007). Subsets of each QSEN competency include knowledge, skills, and attitudes (KSAs) achievable during the educational process. Therefore, adding QSEN to every simulation experience is one potential avenue to ensure exposure to the wide array of experiences needed to confer competency. Unlike the hospital setting, these created scenarios in simulations can virtually guarantee exposure to multiple KSAs and QSEN competencies not available otherwise to students (Durham and Alden, 2012).

Evidence based practice related to the Human Patient Simulator (HPS) becomes an essential component of the contemporary nursing education (Bremner et al., 2006, 2008). This approach led the healthcare service to use HPS as a teaching strategy for healthcare professionals (Hofmann, 2009), and for nursing students (Alfes, 2011; Bearnson and Wiker, 2005; Shepherd et al., 2010; Ward-Smith, 2008). Further contemporary motivation to include simulation in nursing education is that opportunities for learning in clinical settings are increasingly limited, so alternatives to traditional approaches for clinical learning must be found (Edwards et al., 2004). This contemporary approach in nursing education raises the question: to what extent does using the HPS in nursing education impact nursing students' perceived anxiety levels, self-confidence, caring ability and caring efficacy in their first clinical experience? An evaluation of students' outcomes might provide us with an answer.

Background

The literature defines simulation as a near representation of an actual life event, which can be presented through different methods such as computer software, case studies, written clinical scenarios,

* Tel.: +972 4 692 7778; fax: +972 4 692 7776.
  E-mail address: rabeikh@zefat.ac.il.

live actors, role playing, games or mannikins (Bearnson and Wiker, 2005; Beaubien and Baker, 2004; Goldenberg et al., 2005; Mould et al., 2011). High-fidelity simulation is a relatively new method in nursing education, utilizing high technology simulation monitors and computers (Sanford, 2010). Simulations have long been used to promote learning in the healthcare professions and provide a safe, acceptable environment for practicing skills (Ward-Smith, 2008).

The literature points out several advantages and many positive outcomes in using simulations for nursing education. For example, simulation may improve students' critical thinking skills and retention of content, and provides students with the opportunity to practice simple and complex skills in a non-threatening environment. Such skills include cardiopulmonary resuscitation, maternal and newborn care using a birthing simulator, urinary catheter insertion, nasogastric tube insertion and the like (Sanford, 2010). Findings reported by the literature also stated that simulation could be a helpful intervention to strengthen the connection between theory and practice (Morgan, 2006), and is a productive learning strategy which broadens theoretical learning and supports the practice element of nursing education (Prescott and Garside, 2009). For example, Morgan (2006) found that students reported that simulations which they identified as basic nursing skills, which were taught in the clinical skills laboratory before the first practice placement, as useful. Practice through simulations of nursing skills such as taking and recording patients' vital signs and hygiene needs enabled them to integrate theory with practice during their first practice placement.

Learning through simulation also provides immediate feedback, facilitates repeated experiences activated on various levels of difficulty, activates different varied learning strategies, enables drills and individual learning, defines clear and achievable goals, and imitates real life to a certain extent (Issenberg et al., 2005). The literature also shows that simulation-based learning consistently decreases anxiety among novice nursing students at their first clinical experience (Bremner et al., 2006, 2008; Szpak and Kameg, 2011), and promotes their level of self-confidence and clinical competence (Brannan et al., 2008). For example, Bremner et al. (2008) found that a majority (71%) of the nursing students agreed or strongly agreed that using the Human Patient Simulator (HPS) gave them confidence with physical assessment skills, and 65% agreed or strongly agreed that the HPS relieved their stress on their first day of clinical placement. Szpak and Kameg (2011) also found that students' anxiety level significantly decreased by 0.3 points after the simulation experience.

Learning through simulation also raises the students' satisfaction with learning (Alfes, 2011; Blum et al., 2010; Mould et al., 2011; Prescott and Garside, 2009), and improves their level of knowledge, and clinical performance (Bearnson and Wiker, 2005; Liaw et al., 2011) as well as their self-efficacy (Goldenberg et al., 2005). Moreover, simulation experience reinforces the development of skills in assessment, psychomotor activity, problem solving, decision making, and critical thinking by encouraging the students to think deeply and ask appropriate questions, and by providing feedback (Cant and Cooper, 2010; Mikkelsen et al., 2008). It also can affect patient care, health and safety (Rothgeb, 2008).

The presence of anxiety in beginning students in the clinical setting is well-documented in the literature (Sharif and Masoumi, 2005; Shipton, 2002). Anxiety may negatively affect students' caring efficacy (King, 2010), and actual patient care in the clinical learning setting (Beddoe and Murphy, 2004), for example, by reducing their performance level during clinical practice (Cheung and Au, 2011). Moreover, Szpak and Kameg (2011) claimed that if students feel less anxious, they may be more effective in establishing a therapeutic relationship with the patients, and ultimately enhance patient outcomes.

The literature also cites three factors that may mediate the correlation between the student's anxiety level and caring efficacy: self-confidence, caring ability, and satisfaction with simulation (see Fig. 1). The literature showed that the use of simulation scenarios throughout the undergraduate curriculum can be beneficial in reducing anxiety and enhancing student's confidence and ability regarding patient care decisions since no harm to the patient occurs (Rhodes and Curran, 2005). Other investigators have noted that high levels of anxiety can lead to the student's decreased confidence levels (Horsley, 2012); and inhibit the student's ability to care for others (King, 2010). King (2010) also noted a negative correlation between students' anxiety and satisfaction from clinical practice. White (2003) and King (2010) reported that when students lack confidence in their ability to complete a nursing skill, they focus on their concern that they might make a mistake, which leads to disruptions in their decision making and critical thinking, and lowers their caring efficacy. Therefore, it is interesting to examine these mediating effects in the context of simulations combined with the first clinical experience among nursing students.

The use of simulation has resulted in increasing interest in engaging in evaluating the outcomes of simulation. Although many student outcomes have been examined in the literature within the context of nursing simulation, caring ability and caring efficacy are two outcomes that have never been examined in the context of simulation, until now. The present analysis is one of the few efforts to examine the effectiveness and outcomes of using simulation in nursing education in Israel.

Hypotheses

Three major hypotheses were considered. First, that anxiety will decrease, while self-confidence and caring ability will increase between T1 (before the first clinical experience and simulations sessions), and T2 (after they finished their first clinical experience with the simulation
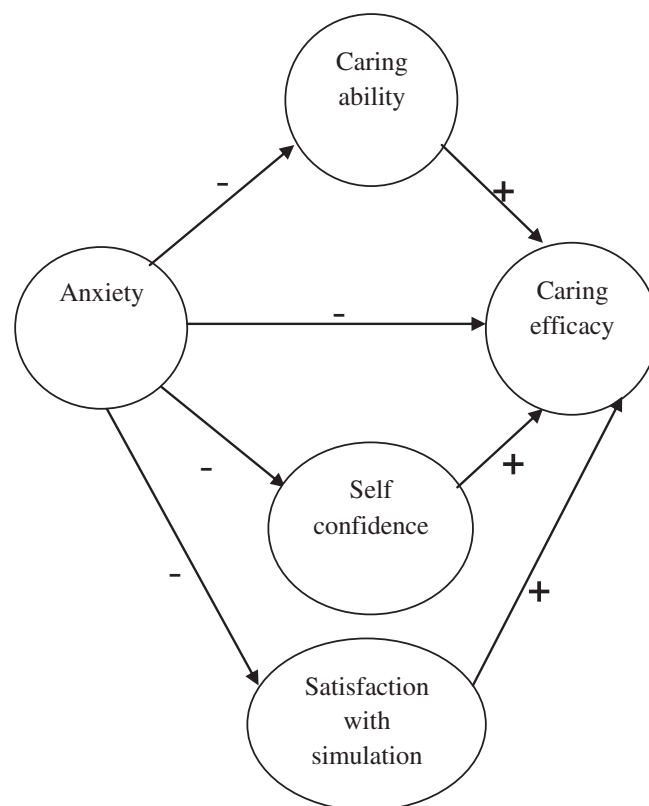

Fig. 1. The study model: predicting and mediating paths.