

Original Article

The Effects of Using Simulation in Nursing Education: A Thorax Trauma Case Scenario

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Abstract

Aim: This qualitative study aimed to determine nursing students' opinions related to experiencing a thorax trauma scenario in a lifelike high-quality simulation environment.

Method: The data was collected by method of qualitative interview. The study was carried out with seven third-year nursing students. The researcher prepared the emergency room and Sim Man according to the scenario. Emergency nurses and a doctor, who were clinical teachers, were located in the emergency environment. The researcher assigned student roles and provided a status summary of the case. Recordings were viewed together with the students to identify and correct mistakes. The students' views about this method of learning were assessed.

Results: Students stated that they experienced excitement and anxiety during the simulation and that they felt the learning environment was very realistic, as if they were treating a real patient. Students found training with simulation to be useful for improving their skills and efficient than only providing treatment to a mannequin.

Conclusion: Findings show that simulated learning in a clinical skills laboratory increases students' confidence and prepares them for real clinical settings. Widespread use of the simulated training method is recommended.

Key Words: Education, Nursing Student, Simulation, thorax trauma.

Introduction

Simulation has been an important aspect of nursing program curricula for decades (Gomez & Gomez, 1987). Simulation teaching strategies are used alone or in conjunction with other teaching methodologies to enhance the learning experience. They reinforce principles of adult learning theory, allowing learners to build upon their knowledge and experiences with patient scenarios often encountered in the clinical setting. In the past, examinations were used to determine competency. Currently, simulation provides a hands-on approach to assessing a learner's psychomotor skills and critical-thinking abilities (Blevins, 2014; Bremner et al., 2005; Goris ve ark., 2014). Simulation experiences provide authentic and clinically relevant opportunities for experiential learning (Goris ve ark., 2014).

Educating nurses to provide competent care in today's health care environment is becoming increasingly challenging because of the need to care for complex patients in complex care environments (Blevins, 2014). Nurse educators are increasingly challenged to find adequate clinical experiences to prepare students for such practice demands (Cioffi et al., 2005; Decker et al., 2008, Rhodes & Curran, 2005). As nurse educators, we need to prepare nurses to have skills and abilities in critical thinking, decision-making, and teamwork while equipping them with knowledge and skills in major content areas (Issenberg et al., 1999; Lambton et al., 2008; wang et al., 2014). There is a recognized gap between clinical practice and the theory provided in nursing schools that can be addressed using simulation (Alinier, 2006). Simulation training is a recommended strategy to teach safe clinical practice because initial learning for health-care

professionals in a real patient setting is hindered by changes in resources, such as shorter length of patient stay, higher patient acuity, nursing staff shortages, and a greater concern and emphasis on medical errors (Rauen, 2004; Reilly & Spratt, 2007).

A review of the literature identified the following potential benefits of simulation sessions (Feingold et al., 2004; Comer, 2005; Lapkin S & Levett-Jones, 2011);

- Provision of opportunities for active involvement in diverse clinical situations
- Exposure to critical clinical scenarios encountered in a “real” clinical environment
- Opportunities to integrate clinical skills, interprofessional communication, teamwork, physical assessment, nursing therapeutics, and critical thinking in a realistic, but non-threatening environment
- Mistakes can be made and learnt from without risk to patients. Opportunities for repeated practice of requisite skills and formative and summative assessment can be provided.
- Students are able to practice a procedure prior to performance on a live patient. Recently, however, high-fidelity simulation, with the increased level of sophistication and realism it brings to the laboratory setting, has elicited the possibility of simulation being used as a substitute for actual clinical experience. High-fidelity simulation refers to structured student learning experiences with the use of a technologically advanced computerized mannequin, the Human Patient Simulator (HPS). HPS is anatomically precise and reproduces physiologic responses. Students are provided with sequential decision-making events within an environment that mimics a clinical setting. Instructors can control the mannequin’s responses and the HPS can respond to interventions provided by the student (Lasater, 2007; Limoges, 2010). The aim of the present study was to determine nursing students’ opinions related to simulation education after experiencing a chest trauma scenario in a lifelike high-quality simulation environment.

Material and Method

Design and Sampling: The goal of this study was to determine nursing students’ opinions related to simulation education after experiencing a chest trauma scenario in a lifelike high-quality

simulation environment. This study used a qualitative interview method. Participants were seven volunteers from third-year students in a university’s faculty of nursing.

Setting and Procedure: We used our simulation laboratory. It is a state-of-the-art simulation training center equipped with life-sized, computer-controlled virtual patients capable of simulating nearly any acute and critical patient episode, including drug overdoses, respiratory distress, and cardiac decompensation. Audio and video systems in the adjoining classroom enables trainees and faculty to observe teaching sessions, interact with the instructor, and participate in guided performance feedback of the videotaped training sessions.

In the first phase, the emergency room and the HPS, SimMan, were prepared in accordance with scenarios developed by the researcher. Emergency nurses and a doctor, who were clinical teachers, were positioned in the emergency environment. The researcher explained the students’ roles and gave a status summary of the case. Information for the case scenario was coded into a computer. After the students were presented with the emergency environment simulation, the doctor, in a training role, gave prompt care for the patient once the simulation had started. The simulation process was continuously recorded for 20 minutes with the help of camera and sound system. We watched the video together to determine the students’ mistakes and correct their application. After this, the students were interviewed to determine their views about this method of learning.

Data Collection: The open-ended interviews were conducted by the researchers on the same days as the simulation sessions. After the interviews, the interviewers immediately made field notes, which were also analyzed.

A question guide was available for the interviews, with the general open-ended question, “You have just finished participating in simulation. Could you evaluate your experience?” Afterwards, if the reply had not fully covered the points required by the researcher, probing questions were asked to gain more information such as “What have you learned in the thorax simulation?” “What did you feel in the simulation?” “What is your opinion about the advantages of simulation for teaching nursing?” and “What is your opinion about the

disadvantages of simulation for teaching nursing?”

Data Analysis: The qualitative analysis began with transcribing and reading the interviews during the period in which data collection was also occurring. Afterwards, a content analysis was conducted using constant comparative techniques to evaluate the variation or similarities among the collected data. Once the seven interviews were examined and there were no new elements appearing in the analysis, the authors determined that the stage of theoretical data saturation had been reached and that the information gathered was sufficient for the aims.

The Thorax Trauma Case Scenario

A 45-year-old woman was admitted to the emergency department after a traffic accident. The patient, who was conscious, in pain, and cooperative was transported to the emergency department after approximately one hour by a 112 ambulance team who were the first responders at the scene of accident. She was accompanied by her husband who insisted on having his wife treated by a female doctor. Emergency physicians identified that the patient had hypotension, tachycardia, and open pneumothorax. There was a fracture of the 6th rib; and the 7th ribs were bruised. Dyspnea and superficial respiration were observed due to pneumothorax and hemothorax. The patient was anxious and crying.

Key issue(s) of the case:

Clinical/medical: Fracture of 6th rib, bruising on 7th; dyspnea, superficial respiration, pneumothorax, hemothorax, hypotension, and severe pain

Human factors: Husband was experiencing a panic attack. There was conflict between the health care workers and her husband.

Intended learning objective(s) and debriefing points:

Clinical/Medical:

- Assess patient
- Prevent atelectasis of patient
- Give oxygen to prevent hypoxia
- Perform physical examination
- Evaluate pneumothorax
- Open the airway

- Prepare patient for draining of chest
- Monitor vital signs and SaO₂
- Prevent infection
- Manage pain

Human Factors:

- Manage panic attack of husband
- Deal with cultural diversity and patient's requests
- Manage conflict

Simulator team roles:

- Emergency physician (male): 1
- Emergency nurse: 1
- Husband: 1
- SimMan voice (female): 1

Target participants:

Four third-year nursing students who were asked to act as newly qualified nurses.

Results

All the participants were female and their average age was 21 years. After the simulation, students stated that they experienced excitement and anxiety during the simulation and that the learning environment was very realistic, as if they were treating a live patient. Moreover, the results indicated that students found simulation training useful for improving their skills, which were applicable beyond their treatment of the mannequin.

Sample statements expressing students' feelings regarding the simulation

“I felt so excited” (student 3).

“I felt so confused” (student 5).

“I felt good and confident” (student 1).

“I felt successful” (student 6).

“I felt like a real nurse” (student 4).

“I felt that I was a real nurse” (student 2).

“I felt like I had to force myself because this was the first time I had to resuscitate a patient” (student 7).

Sample statements of students regarding the advantages of simulation for teaching nursing

“My confidence level was increased after participating in the simulation activity” (student

4).

“I found them so useful. It provided us with confidence” (student 1).

“It is important to implement theoretical knowledge on mannequins. Using mannequins develops my knowledge and we cannot damage the mannequin through practice” (student 5).

“The learning environment felt very realistic and I can't damage the mannequin if I make an error” (student 7).

“I think it is useful for improving my skills about training with simulation” (student 2).

“I like this simulation training because this learning environment was very fun” (student 3).

“I'm here to learn and to feel good about learning and this learning environment is very useful” (student 6).

“Simulation developing our nursing skills... it is very useful. I learned critical care from this scenario” (student 1).

Sample statements of students regarding the disadvantages of simulation for teaching nursing

“Time was very limited, and I felt a bit nervous” (student 3).

“We have to act very fast. We have to work in an organized manner and make a decision very quickly because we were forced to race against time” (student 7).

“I think this method doesn't have any disadvantages” (student 1).

“We don't get in touch with the patient because she is not a real human” (student 4).

“I felt so confused because everything was so new for me. I was a little lost when I faced the patient” (student 6).

Discussion

The goal of simulation is to provide an opportunity to improve the efficiency, effectiveness, and safety of patient care. Simulation provides a clinical environment in which mistakes are acceptable (Gomez & Gomez, 1987). Learners are able to see the results of their actions without harming the patient as learning is reinforced. It is important to remind students that they should engage in the scenario as themselves and not to engage in role-playing (Alinier, 2006; The Society for Simulation in Healthcare).

As demonstrated by our study, the students seemed ready for this innovative teaching and learning strategy. The results indicated that the students thought that superior practices were incorporated in the design and implementation of the simulation. All the students agreed that the simulation experience had enhanced their skills in many aspects of nursing practice: problem solving and decision-making, understanding the basis for intervention, and developing a professional role. It is important for practice teams to work together effectively to identify patient needs, plan work, and involve all members in decision-making and developments in order to fulfill the needs of the patient (Wang et al., 2014).

Specific learning needs and competencies based on the individual practitioner or specialty area are addressed. Simulation with multiple providers can develop team cohesiveness when issues related to communication, decision-making, and risk for potential errors are identified. Low-frequency high-risk patient scenarios can also be practiced so providers learn to identify critical situations and take action to prevent poor patient outcomes (The Society for Simulation in Healthcare; Laerdal Medical). A thorax trauma scenario was used to provide students with critical care experience and problem solving and decision-making abilities.

The literature includes many studies about the usefulness of simulation in the training of nursing students. Alinier (2006) mentioned intermediate-fidelity simulation as a useful training technique that is very valuable in equipping students with a minimum of technical and non-technical skills before they use them in practice settings. Roh et al. (2014) reported a moderate level of stress, favorable perceptions of an integrated course, and no significant differences in levels of stress and student perceptions by course grade after experiencing an integrated course. Wang et al. (2014) showed that simulation is an effective teaching strategy for Chinese nursing students.

Limoges (2010) study shows how discourses rationalize and sustain certain processes at the expense of others. For example, ruling discourses such as biomedicine, efficiency, and relational ontology are activated to construct the simulation lab as part of nursing and nursing education. The analysis also highlights the intended and unintended effects of these discourses on nursing education and discusses how emphasizing

nursing knowledge can make the simulation lab a positive place for learning. Moreover, Hicks et al. (2009) implemented a randomized control design to show that there were no significant multivariate differences between simulation and clinical training groups in changes in knowledge and self-confidence. Aqel and Ahmad (2014) determined that high-fidelity simulation (HFS) provides students with interactive learning experiences in a safe controlled environment.

HFS enables teachers to implement critical clinical scenarios, such as cardiac arrest, without risk to patients. Thus, integrating simulation training into nursing curricula will help to overcome the challenges that are faced in many courses, specifically the shortage of clinical areas for training and increases in the number of nursing students.

Conclusion

The findings show that simulated learning in a clinical skills laboratory is reported to increase student confidence and prepares students for real clinical settings. High-fidelity simulation is a useful training technique that enables small groups of students to practice how to react adequately to a critical patient care situation in a safe and controlled environment. Widespread use of the simulated training method is recommended.

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