Featured Article

The Effects of Simulated Clinical Experiences on Anxiety: Nursing Students’ Perspectives

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Abstract

Background: Beginning baccalaureate nursing students (BSNs) are known to be apprehensive the first time they are required to provide patient care within a hospital setting. This study assesses the effect of simulation as an initial clinical experience on nursing students’ anxiety levels.

Method: Junior-level BSN students enrolled in the fundamentals and health assessment courses at a southeastern university were assigned randomly to two groups: preclinical simulation experience (intervention) and no simulation experience prior to human patient contact. Anxiety levels were compared between the groups. The intervention was a mock hospital unit simulation in the learning resource center, which allowed each student to care for a simulated patient for 4 hours. A patient problem was incorporated into each scenario. The outcome measure was the Spielberger State-Trait Anxiety Inventory.

Results: The experimental group’s anxiety scores were significantly lower ($p = .01$) than the control group’s scores (11.0 $\pm$ 2.8 vs. 13 $\pm$ 3.4).

Conclusion: These findings demonstrate the value of a simulation experience to reduce anxiety levels among junior-level nursing students.

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Simulation is rapidly becoming an essential strategy in nursing education for teaching the principles of patient care in a controlled and safe environment. During simulation, nursing educators can bring theory to life in a controlled setting in which it is safe for students to learn from mistakes without fear of causing actual patient harm. Simulation is an ideal venue for developing and practicing the complex skills of critical thinking and problem solving (Burgess, 2007; del Bueno, 2005; Holtschneider, 2007). Lecture and didactic content delivery will exist within nursing curriculum as the fundamental methodology for teaching skills and scientific principles. However, a variation of experiential simulation exercise—role play, performance of tasks in a simulated clinical unit, or a case study vignette—can augment any course content delivery. Furthermore, infrequently encountered clinical situations can be built into simulation scenarios so that all students are exposed to such events, resulting in reduced anxiety and better preparation for managing adverse outcomes that arise in the actual clinical setting.
Recreatin difficult patient encounters during simulan can allow students a safe outlet for the expression of emotions, which can result in reduced anxiety when students face real-life care situations (Overstreet, 2008). An appreciation of the importance of teamwork and collaboration was recognized as an outcome of participation in mock code simulation exercises in a study involving senior baccalaureate nursing students and 3rd-year medical students working together. Both cohorts realized the value of improved relationships in achieving positive patient outcomes (Dillon, Noble, & Kaplan, 2009).

Faculty members who teach at the first semester junior level in this study’s setting—a university in the southeastern region of the United States—have long noted that first-semester nursing students are extremely apprehensive the first time they are required to provide patient care within a hospital setting. To help ease the transition of novice student nurses from the skills laboratory to an acute care setting, a teaching strategy was developed that included patient-care scenarios within a simulated hospital unit, or “mock hospital,” that has been described in detail previously (Gore, Hunt, & Raines, 2008). However, there is limited empirical evidence of the effect of simulation of a hospital experience on student nurses’ anxiety levels prior to actual patient care in a clinical setting. The purpose of this study was to determine the effect of experiencing simulated patient care within a mock hospital environment on junior-level nursing students’ anxiety levels prior to their actual clinical experience.

The purpose of this study was to determine the effect of experiencing simulated patient care within a mock hospital environment on junior-level nursing students’ anxiety levels prior to actual patient care in a clinical setting. The research question became, Prior to a hospital-based clinical experience, are there differences in self-reported anxiety levels between students participating versus not participating in a preclinical simulated hospital experience?

**Method**

**Theoretical Framework**

The conceptual framework for this study was based on the Jeffries simulation model (Jeffries, 2007), which was developed specifically for design, implementation, and evaluation of simulation experiences in nursing education. This model (Figure 1) illustrates how the triadic relationship of students, teachers, and educational practices influences both simulation design and desired outcomes. The key factors that affect novice students’ feelings of apprehension are directly related to the lack of training in psychomotor skills and nurse—patient interaction. Success in performing unfamiliar skills during simulations should decrease anxiety, thereby enhancing learning and promoting self-confidence. Therefore, the overall effectiveness of the simulation in this study was based on a measurable decrease in student-reported anxiety. With the junior-level students’ enhanced self-confidence, subsequent simulation experiences may reach for even higher levels of expectation on the part of student and teacher as predicted by the Jeffries model. However, because anxiety was not included in the simulation model, we were interested in exploring decreased anxiety as another potential outcome of a simulation experience.

**Participants**

First semester Junior baccalaureate nursing students enrolled in fundamental skills and health assessment courses provided the convenience sample. All students (n = 92) participated in the required laboratory skills and simulation experiences, but data presented in this study describe only the results from those who participated in the randomized study and provided written consent. The total study sample thus included 70 nursing students, or 78% of the junior-level nursing student class. The class is 88% female and 98% White. The average age on admission is 22 years. University institutional review board approval was granted prior to the start of the study.

**Design and Preliminary Study**

Prior to this study, we conducted a pilot study to determine the feasibility and effectiveness of assessing anxiety levels among nursing students (n = 40). In the pilot study, students were
randomized into clinical groups. Only students who consented to participate were placed in the study. Beginning junior level nursing students were randomized into clinical groups of 8 students each. The experimental group (n = 24) participated in a simulation experience prior to an actual clinical experience, and the control group (n = 16) did not have this preliminary, virtual experience. As the experimental group worked through their 4-hour shift in the simulated hospital unit, the control group began the inpatient clinical rotation and later returned to campus to participate in the unit simulation.

The control group self-reported their anxiety level prior to the first clinical experience and after participation in the mock-hospital-unit simulation. The experimental groups participated in mock-hospital-unit simulation as their initial clinical experience. Student anxiety level for the experimental group was measured after simulation and prior to actual human patient care.

To assess anxiety levels, the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) was administered to each student prior to the actual clinical experience. The pilot study results revealed a STAI mean score of 12.3 among those who participated in the simulation experience, compared with a score of 14.8 for the control group (n = 16), a finding that is statistically significant at p = .005. A replication of this study was conducted the following year with a larger sample size, consisting of the majority of junior-level nursing students, and provided the data for this report.

**Instrument**

The STAI was developed in 1964 by Spielberger et al. (1983) and contains one set of 20 self-reporting items that measure both state and trait anxiety with a 4-point Likert-type scale. State anxiety is a transitional response to a stressor, as opposed to trait anxiety, which is a personality characteristic. The reliability and validity of Spielberger’s tool has been confirmed over time through multiple measures. Cronbach’s alpha coefficients for state and trait anxiety were .93 and .90, respectively. The test—retest correlations for trait anxiety were .73 to .86. However, because of situational factors that exist with state anxiety, the median reliability ranged from 0.16 to 0.62 among college and high school students. Internal consistency measures were satisfactory and stable in all studies (Spielberger et al., 1983). As a result of the transitory nature of state anxiety, the alpha coefficient is more meaningful in reliability for state anxiety, and thus it was used as the primary measure in this study. Higher scores indicate a higher self-reported level of anxiety. The publisher granted permission to the authors for use of the Spielberger tool.

**Intervention: Simulated (Mock-Hospital) Experience**

The simulated hospital unit was described in detail in a previously published article, including the patient scenarios (Gore et al., 2008), and are summarized here. After completing 7 weeks of skills and health assessment labs, students who were randomized to the simulated hospital experience took part in a 4-hour “shift” within a simulated medical—surgical unit set in the skills laboratory of the nursing building. Students were then assigned a low-fidelity static manikin to which to provide total nursing care. Two faculty members and the lab coordinator were present for each session in order to provide guidance and assistance. Learning goals for the simulation experience included the following: Provide total patient care employing safety principles; use effective communication techniques with patients, staff, students, and faculty; develop, implement, and evaluate a plan of care for assigned patient; implement effective time management strategies; and become familiar with expectations of the clinical experience.

As the simulation began, students reviewed the patients’ charts for 15 to 20 minutes. Faculty then led a discussion that addressed priority nursing diagnoses, along with anticipated assessments and interventions for each assigned patient. Students next proceeded to provide bedside care, which included interventions such as personal hygiene care, wound care, and medication administration. The students used personal data assistants as needed to gather information about medications, nursing considerations, and diagnostic tests. Medication administration included oral, intravenous, subcutaneous, and intramuscular routes. Each student then developed and implemented a plan of care, enlisting additional support from their colleagues as needed. Traditional paper charting of all assessments, interventions, patient education, and medication administration was required.

Individual student debriefing occurred as mistakes occurred or planned problems were discovered by students. At the end of the 4-hour session, a postconference meeting (debriefing) was held in which each student gave a comprehensive patient report, including pathophysiology, priority actions, and care provided. The students received a step-by-step guided reflection from faculty regarding prioritization of care, communication issues, universal precautions, safety measures, psychomotor competencies, and identification of adverse outcomes. During the debriefing, students relayed their opinions about the care they provided and, notably, the sometimes erroneous assumption that caregivers from the previous “shift” had left the patient safe and all equipment functioning properly. The experience is summarized in Table 1.

**Data Analyses**

All analyses were completed with SPSS Version 11.5 (SPSS, Inc., Chicago, IL). Differences of STAI anxiety mean scores between student groups were assessed with Student’s t tests as a continuous variable. During the debriefing sessions, qualitative data was also collected by noting subjective comments from students and faculty about
the simulated hospital experience to help further refine the simulation process for the future.

**Results**

**Quantitative Data**

The anxiety scores of the experimental group \( (n = 47) \) were 11.0 \( (= 2.8) \). The control group \( (n = 23) \) reported anxiety levels at 13 \( (= 3.4) \); Figure 2). In a two-tailed \( t \) test, the results from this study also showed a statistically significant difference in STAI mean scores \( (p = .01) \).

**Discussion**

The self-reported anxiety scores of students who experienced the preclinical simulation were significantly lower than the self-reported anxiety scores of students who did not have the preclinical simulation experience.

We found only a few articles that addressed the evaluation of student anxiety and simulation. Erler and Rudman \( (1993) \) conducted a study of the effects of intensive care simulation on anxiety of nursing students in the clinical intensive care unit. The focus of this study was psychomotor skills, and the Spielberger state anxiety tool was used to measure the students’ anxiety level. Erler and Rudman concluded that familiarity with psychomotor skills is beneficial; it did not decrease the anxiety level in the critical care setting, and there was no statistical significance. However, Bremner, Adudell, and Amason \( (2008) \) conducted a study of evidence-based practices related to human patient simulation and 1st-year baccalaureate nursing students’ anxiety. This study found a statistical significance when answering questions about their comfort level in starting clinical. No significance was noted related to students’ learning and coping styles and anxiety levels. The Spielberger state anxiety tool was used to measure the anxiety level in this study also.

Sinclair and Ferguson \( (2009) \) reported findings that suggest simulation alone or a combination of simulation and traditional teaching methodology may promote increased student self-confidence. Furthermore, increased self-efficacy was experienced by students who were exposed to simulation exercises in which faculty incorporated case study and role-play \( (Goldenberg, Andrusyszyn, & Iwasiw, 2005) \). Although they were not empirically evaluated in this study, we did hear subjective comments on increased confidence related to the simulated experience. Following the simulation, students consistently reported feeling more confident in their skills and thus better prepared to begin their clinical experiences. One student reported feeling much less apprehensive about entering a patient’s room for the first time. Other common sentiments expressed by the simulation participants were, “It is great to know what to expect and how to plan for the clinical day” and “I feel a lot more comfortable with my skills.” The experience also gave the uninitiated a glimpse into the reality of a nurse’s typical day, as evidenced by comments such as, “I didn’t know I would be this busy and have so much to do.”

Del Bueno \( (2005) \) says that students become effective nurses by learning to manage patient problems (which does not occur when formulating a written care plan or taking an

<p>| Table 1 Overview of Mock Hospital Experience |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Simulation Stage</th>
<th>Learning Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minutes</td>
<td>Preconference</td>
<td>Overview of objectives, schedule, and expectations</td>
</tr>
<tr>
<td>30 minutes</td>
<td>Chart review and faculty-led discussion for patient care</td>
<td>Review assigned patient’s chart for history and physical, progress notes, previous nursing notes, and medication administration record.</td>
</tr>
<tr>
<td>120 minutes</td>
<td>Patient care</td>
<td>Use personal data assistant to look up medications to be given and procedures to be performed.</td>
</tr>
<tr>
<td>60 minutes</td>
<td>Debriefing and guided reflection</td>
<td>Assessments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hygienic care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medication administration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Treatments (dressing change, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Problem identification and correction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faculty-directed review with interactive student dialogue</td>
</tr>
</tbody>
</table>

**Figure 2** Anxiety-level scores were lower in the group of student nurses who participated in a preclinical simulation experience than in the control group.
Simulation offers hands-on application of principles within patient care scenarios, along with the opportunity to question and be questioned by faculty. Such experiences provide the student with critical skill sets that promote the transition from nursing student to novice nurse. In short, simulated patient care creates an avenue for students to perform both individually and within a team, increase confidence, and decrease anxiety, which together serve to create a meaningful learning experience (Sinclair & Ferguson, 2009).

Study participants suggested ways in which to improve the simulation experience. One recommendation is to have better means of verbal interaction with the low-fidelity manikins in order to develop effective communication skills. Another suggested improvement was to arrange for senior nursing students to serve as mentors during the simulations. The researchers will consider incorporating these suggestions in future studies.

Another important result of the simulation was the opportunity for faculty to evaluate students’ clinical abilities and clinical judgment prior to the first clinical rotation. This critical knowledge aided faculty in making optimal student—patient assignments in the inpatient setting. Although Medley and Horne (2005) have suggested that simulation is underused in nursing education, evidence continues to mount in support of including this effective strategy in the nurse educator’s tool kit as a means to bridge theory and clinical practice (Bambini, Washburn, & Perkins, 2009), develop student confidence (Moule, Wilford, Sales, & Lockyer, 2008; Peteani, 2004), and promote safe patient care (Gore et al., 2008), despite barriers associated with simulation, which include cost (Bland & Sutton, 2006), lack of faculty education or training (King, Moseley, Hindenlang, & Kuritz, 2008), space availability (Reeves, 2008), and time needed for both preparation and implementation (Feingold, Calaluce, & Kallen, 2004). Even with these sometimes considerable barriers, there are substantial benefits to the use of simulation as a teaching strategy.

### Limitations

This study included a convenience sample of 70 students with similar demographic characteristics, from a single school of nursing in the southeastern United States. Thus the results may not be generalizable to other nursing students in other programs or geographical regions. Furthermore, the self-report measure of anxiety level may be subject to the general limitation of all self-report measures, that is, that they may not completely represent actual feelings. However, because we observed similar findings in both the pilot study and the larger study, we do believe that the simulated hospital experience did produce a positive effect on anxiety levels prior to the actual clinical experience.

### Conclusions

This study adds to the body of simulation research and clearly underlines the importance of simulation as an active learning strategy in nursing education. These findings demonstrate the value of reducing one critical barrier to learning: anxiety level. This and similar studies that evaluate other outcomes may give nursing educators valuable methods with which to better prepare future nurses in the delivery of safe and effective patient care.

### Acknowledgment

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