The Evaluation of Simulation in a Baccalaureate Nursing Program

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KEYWORDS
simulation; nursing; evaluation; active learning; fidelity in simulation

Abstract
Background: A public university acquired 4 high-fidelity simulators for integration into the undergraduate nursing curriculum. The purpose of this study was to assess learning after using the simulators in a laboratory setting in one nursing course.

Method: Students evaluated 4 simulation experiences for active learning, fidelity, and student satisfaction and confidence. An analysis of variance was completed with SPSS to determine the effectiveness of the simulation experiences.

Results: The results of the evaluation demonstrate that fidelity is valued by students. Simulations that used role-playing integrated with communication techniques were scored highest by the students. The students were satisfied with the simulation experience and scores of self-confidence increased with every simulation experience.

Conclusions: Simulation was successfully added to a medical-surgical class to enhance the clinical experience.

Cite this article:

In 2006, a Midwestern undergraduate nursing program underwent several dynamic changes that included the acquisition of four SimMan® (Laerdal) manikins for classroom and laboratory use. The challenge for faculty was to integrate the use of the SimMan manikins into the undergraduate nursing curriculum. Faculty teaching the adult medical-surgical nursing course embraced the use of SimMan and other simulation methods for the application of class content. The use of SimMan simulation provided opportunities for nursing students to integrate didactic content with active participation and enhance critical thinking skills.

Use of Simulation

Simulation creates an environment realistic to a given work setting in order to provide participants with the opportunity of “practicing” psychomotor skills, as well as applying knowledge to the setting. Thornton and Mueller-Hansen (2004, p. 4) described a simulation exercise as “an activity resembling an organizational situation in which participants are presented complex stimuli and expected to display complex overt behavior.”

Simulation has been used for many years. Examples include the use of flight simulators for pilots and astronauts, aircraft simulators for testing aviation equipment, and simulation of
The need for simulation arises from a multitude of issues, which include the growing demand for student clinical sites, an increased awareness of patient safety and medical errors, the increasing use of technology in medicine, and the need for continuity of clinical assignments for students. The major factors influencing changes in nursing education are national mandates for improvements in patient safety and quality of health care education, technological advances, and health care systems that affect clinical education (Nehring, 2008).

This study occurred at a university that partners with local community hospitals, that have approximately 900 patient beds, that are shared by four separate nursing programs and multiple nonnursing, health-related programs. Student clinical experiences are often staggered across days and shifts to achieve the required number of clinical hours. Advantages of the simulation lab are that students are provided with alternative clinical experiences and the burden of additional students on health care facilities is decreased.

The need to improve patient care has been well established and cited in the government report To Err Is Human (Kohn, Corrigan, & Donaldson, 1999). Safety goals have been clearly outlined by the Joint Commission on Accreditation of Healthcare Organizations (JACHO) within the national safety initiative for all health care institutions (Joint Commission, 2007). A second advantage of simulation is providing a safe environment, both physically and psychologically, in which to practice skills and perform patient care. Mistakes can be made without fear of harming a patient.

The third advantage of simulation is that technological skills may be introduced in a laboratory setting and the student may become familiar with equipment used in the clinical setting. Examples of technology that have surfaced in recent years in health care are the use of computerized charting, individualized medication delivery systems, glucose levels monitoring, pulse oximetry, and intravenous administration systems. Students quickly encounter the need to understand technology when they begin giving care during the acute care clinical experience.

One final advantage of simulation is that students can confront situations that they may not encounter in the hospital setting because of low patient census or unavailability of a specific diagnosis at the time of their clinical experience. The development and control of challenging scenarios ensures that every student is exposed to the same simulation, with planned consistent objectives.

**Purpose**

The purpose of the study was to analyze mean differences in student perception of active learning and fidelity among four simulation scenarios. Student perception of the presence of active learning and fidelity were assessed during a 12-hour clinical simulation experience scheduled during one nursing course. In addition, student satisfaction with simulation and student confidence using simulation were measured.

**Key Points**

- Simulation can provide active learning opportunities.
- Nursing student’s perceptions of simulation were positive.
- Students valued integrating role playing with simulation.

Simulation is categorized according to levels of fidelity, beginning with low fidelity at one end of the continuum and high-fidelity at the other (Jeffries, 2007). Examples of low fidelity are the use of case studies or role-playing related to a given situation. Moving along the continuum, static models are used for the practice of skills such as inserting a nasogastric tube or the care of a chest tube. At the upper end of the continuum is high-fidelity, which may take the form of a computer-generated scenario that gives the student lifelike interaction with a manikin. The expectations associated with high-fidelity are often greater than at other levels and address critical thinking, prioritization, or the integration of multiple concepts within the scenario (Rauen, 2004).

Two aspects of fidelity to consider are engineering or physical fidelity and psychological or functional fidelity. Engineering fidelity is the degree to which the training device or environment replicates the physical characteristics of the real task (Maran & Glavin, 2003). Creating an environment that replicates an acute care hospital setting was the goal of this study. The program employed a full-time manager for the clinical simulation center to devote the time and effort needed to authenticate the environment. Psychological fidelity is the degree to which the skill or skills in the real task are captured in the simulated tasks (Maran & Glavin, 2003). The goal is for the student to be able to positively perform and transfer the skills learned in the simulation.

For many years nursing education has used simulation in a laboratory setting, providing anatomical models for skills education, replicating hospital rooms, and having students practice using medical equipment before actually attending to patients. Only in recent years has nursing become involved in high-fidelity simulation.
The Sample and Setting

The setting was an undergraduate simulation center outfitted with four Laerdal SimMan manikins in a hospital-like laboratory similar to a medical-surgical unit in an acute care setting. The simulation center is independent of other classrooms and provides students with a dedicated learning environment. All nursing students in the spring 2008 medical-surgical class participated in the simulation exercises. Permission was obtained by the university’s institutional review board to collect evaluation data during and after each simulation exercise. The study was explained to the student as an assessment of clinical learning in a simulation. Each student was given the option to refuse to participate in the assessment without grade or course ramifications. All 79 students chose to participate in the study. Students were required to attend the simulation lab. No grades were given for the simulation, but the content was supported by classroom lecture and tested using unit exams. Students who were absent were required to make-up the simulation.

Demographic information for the 79 students participating in the study revealed that ninety percent (90%) were female and the average age was 23.8 years. The students were in the 3rd year of a bachelor of science of nursing program. Participants had completed five nursing courses which included both a skills course and a medical-surgical course that required 180 hours of acute care clinical. The simulation exercises were part of the second of a series of three adult medical-surgical classes. The first course focused on cardiac, respiratory, and musculoskeletal systems. The second course focused on hematology, oncology, and the gastrointestinal system. The third course focused on critical care nursing.

Simulation Evaluation Tool

The four instruments used to assess learning during the simulation experience were developed by the National League of Nursing (NLN) and the Laerdal Simulation Study Project (Jeffries & Rizzolo, 2006). Approval was obtained from the NLN to use the Simulation Evaluation Tool for the study. Students were asked to complete items on four instruments:

1. The Educational Practices in Simulation Scale (EPSS), is a 16-question instrument that uses a 5-point Likert scale responses to measure the presence of educational practices and the importance of educational practices to the student. Ten questions were extrapolated from the instrument to measure active learning and the importance of active learning. Cronbach’s alpha was found to be 0.86 for the presence of specific practices and 0.91 for the importance of specific practices (Jeffries & Rizzolo, 2006).

2. The Simulation Design Scale (SDS), a 20-question instrument, uses a 5-point Likert scale to measure the presence of specific features in the simulation and the importance of those features to the learner. Two questions from the SDS were used to items measure fidelity. Content validity for the SDS was established by 10 content experts in simulation development and testing. Cronbach’s alpha was 0.92 for presence of features, and 0.96 for the importance of features (Jeffries & Rizzolo, 2006).

3. The Student Satisfaction with Learning Scale, a five-question instrument is designed to measure student satisfaction related to the simulation activity. Nine clinical experts validated the content and relevance of each item for the concept of satisfaction. Cronbach’s alpha was 0.94 for student satisfaction (Jeffries & Rizzolo, 2006).

4. The Self-Confidence in Learning Using Simulations Scale is a 8-question instrument that measures student perception of confidence in the knowledge acquired and the skills performed during the simulation activity. Three of the 8 questions were used to measure student perception of self-confidence. Nine clinical nursing experts established content validity and Cronbach’s alpha, was 0.87 (Jeffries & Rizzolo, 2006).

Research Questions

Does student perception indicate that the educational practice of active learning is present during the simulation experience, as measured by a mean of 4 (M>4) on the EPSS questions?

Is active learning important to the student during the simulation experience, as measured by a mean of 4 (M>4) on the EPSS questions?

Does the student perception indicate that fidelity is present in the simulation experience, as measured by a mean of 4 (M>4) on the SDS questions?

Is fidelity important to the student during the simulation experience, as measured by a mean of 4 (M>4) on the SDS questions?

Were students satisfied with the simulation learning experience as measured by a mean of 4 (M>4) on the Student Satisfaction with Learning Using Simulation Scale?

Was self-confidence in acquiring knowledge and developing skills positively affected by the simulation experience as measured by a mean of 4 (M>4) on the Student Self-Confidence in Learning questions?

The Simulation Framework

The 12 hours of simulation were divided into three separate 4-hour laboratory periods involving four medical scenarios (two of which were completed in one period) which coincided with classroom topics of perioperative nursing, gastroenterology, hematology, and oncology. The first scenario was based on perioperative care for a patient with a bowel resection, the second scenario involved a patient with lymphoma, the third involved a patient with a bleeding ulcer,
and the fourth scenario started with an HIV patient and ultimately led to the death of the patient. Prior to the simulation laboratory experience, the students completed a written assignment to prepare for each experience.

The scenarios were developed using case studies that correlated with the course content. A team of four medical-surgical nursing faculty who held certifications in perioperative, oncology, and wound and ostomy nursing adapted the cases to fit the simulation needs. Jeffries’ (2007) simulation design template was used to ensure that essential information such as the simulation design and sequence, fidelity, evidence-based practice guidelines, debriefing questions, and the National Council Licensure Examination test plan categories were present. The scenarios had not been used previously for simulation.

The labs were conducted by applying a medical scenario to the Laerdal SimMan, a life-size computerized model that interacts with students. SimMan responded verbally in conversation to student questions and comments. The vital signs, lung sounds, and bowel sounds were programmed to respond according to each diagnosis as the scenario progressed.

A team of four to five students were assigned roles as nurses, family members, and observer prior to each simulation. The students with the role of nurse interacted with the patient by performing an assessment, determining priorities in giving care, and teaching both the patient and family, as appropriate. Family members followed a script incorporating the scenario objective to interact with the nurse. The observer took notes, which were shared with the team during the debriefing session.

**Simulation Scenarios**

Table 1 provides a concise description of each simulation.

**Perioperative Nursing**

The perioperative simulation involved an older woman diagnosed with colon cancer who underwent a colon resection with a resulting colostomy. In the first 2 hours of the simulation (Part 1), the students were required to assess the patient 24 hours after surgery with a focused abdominal assessment. The final 2 hours of the simulation (Part 2) focused on patient teaching, which included discharge teaching related to ostomy care, dressing changes, and anticoagulation injections.

Communication among the patient, family members, and the nurse occurred during the simulation. The operator of the simulation was located in a separate room and used a microphone to speak for the patient and respond to the nurse. When asked a question, the operator assumed the role of the patient, readily answered questions, and made comments appropriate to the surgical patient’s status.

The fidelity used during the first 2-hour simulation (Part 1) included a nasogastric tube connected to suction, a dressing soiled with serosanguineous drainage, a Jackson-Pratt drain, an ostomy appliance placed over the stoma, and antithrombotic hose from ankle to knee. The bowel sounds were hypoactive; IV fluids were infusing, and the patient complained of nausea.

The fidelity for the last 2 hours of the simulation (Part 2) was centered on discharge teaching with the following: the nausea was resolved, the bowel sounds were present in all quadrants, the wound required packing with normal saline moistened gauze, and soft stool was in the ostomy bag. The student in the role of the nurse was required to interact with the patient and initiate ostomy teaching, wound care, and instruction of the administration of a subcutaneous injection for anticoagulation therapy.

**Hodgkin’s Lymphoma**

The Hodgkin’s Lymphoma scenario was a 2-hour lab that involved a 27-year-old father post-chemotherapy and radiation. The patient, diagnosed with a fever and pancytopenia, was admitted to an acute care facility. The objective for the nurse was to conduct an assessment and recognize that the patient was suffering from the side effects of chemotherapy and radiation. The nurse was required to call the physician to communicate laboratory reports and receive additional orders, adding realism to this scenario.

**Table 1 Summary of Simulation Scenarios**

<table>
<thead>
<tr>
<th>Simulation</th>
<th>Communication</th>
<th>Fidelity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perioperative</strong>&lt;br&gt;Part 1</td>
<td>Laerdal SimMan®&lt;br&gt;Operator responding as patient using microphone.</td>
<td>Abdominal dressing, ostomy, JP drain, IV, IV medication</td>
</tr>
<tr>
<td><strong>Perioperative</strong>&lt;br&gt;Part 2</td>
<td>Laerdal SimMan&lt;br&gt;Operator responding as patient using microphone.</td>
<td>Discharge instructions and supplies for dressing, ostomy, and subcutaneous injection</td>
</tr>
<tr>
<td><strong>Hodgkin’s Lymphoma</strong>&lt;br&gt;Bleeding ulcer</td>
<td>Laerdal SimMan&lt;br&gt;Moaning of SimMan. Family members responding to nurse.</td>
<td>Radiation skin changes, protective isolation, interpretation of lab results, call to physician</td>
</tr>
<tr>
<td><strong>HIV</strong>&lt;br&gt;Part 1</td>
<td>Laerdal SimMan&lt;br&gt;HIV: Role playing.</td>
<td>Insert nasogastric tube and connect to suction, guaiac testing, IV medication</td>
</tr>
<tr>
<td><strong>HIV</strong>&lt;br&gt;Part 2</td>
<td>Laerdal SimMan&lt;br&gt;Death/dying: Family members responding to nurse.</td>
<td>HIV pamphlets, Assessment form, intradermal injection</td>
</tr>
</tbody>
</table>

Kaposi sarcoma lesions, end of life care, religious items.
The communication used during this scenario was a taped voice embedded in the SimMan system to portray the patient. The SimMan operator chose the appropriate recorded responses when the nurse or family questioned or spoke to the patient. The voice came from within the SimMan manikin.

The fidelity used during this scenario included radiation markings with reddened skin over the groin. The physician’s orders directed the nurse to call with the lab results. The student had to recognize that the lab results indicated pancytopenia, call the physician (a faculty member posing as the physician), and receive physician orders. The patient complained of nausea and needed IV medication, had an infusing IV, and an elevated temperature. An important intervention was the initiation of personal protective equipment for protective isolation, removal of flowers and fruit on the bedside table, and an explanation of isolation to the family members.

**Bleeding Ulcer**

This 2-hour lab was a scenario that focused on a middle-aged male executive admitted to the hospital in severe pain with vomiting. The nurse began with an assessment of a patient in severe pain who was curled into the fetal position. The nurse continued to gather information by noting emesis in the basin, collecting stool for a guaiac test, and inserting a nasogastric tube.

The communication in this scenario was completely dependent on family members who accompanied the patient. Vocal sounds produced by the SimMan indicated to the student that the patient was in severe pain even though the patient offered no verbal information. The students portraying the family members were given a script with cues to interact with the nurse.

The fidelity used during the scenario was portrayal of severe pain by positioning and moaning, administration of IV pain medication, an infusing IV, the use of guaiac stool testing, insertion of a nasogastric tube, and connecting the nasogastric system to low suction.

**HIV, Death and Dying**

During the first 2 hours of this laboratory experience (Part 1), the students interacted with a 50-year-old school teacher recently diagnosed with HIV. The nurse(s) used therapeutic communication to obtain a social and physical history. The primary goals after gathering the patient’s history were to teach about HIV, labs results, and treatments.

The laboratory coordinator played the HIV-patient in place of SimMan. Students assumed the roles of family members of the patient and had scripts to direct the conversation. The nurse interacted with the patient, completed an assessment form, shared information concerning lab results, and gave emotional support as needed.

The fidelity used during the simulation was a clinic setting. The clinic environment included laboratory results available per computerized and written documentation, an HIV assessment form, HIV pamphlets for teaching, and religious items carried by the patient.

The second 2 hours of the simulation experience (Part 2) involved the previous HIV patient who had aged 10 years and was in the end stages of AIDS. SimMan was used as the dying patient with Kaposi’s sarcoma skin lesions and imminent signs of dying. The communication was primarily between the staff nurse and the family members. The nurse’s responsibilities included informing the family of the seriousness of the situation, supporting the patient’s last wishes, and giving comfort to the family.

The fidelity used in the simulation was a monitor for vital signs, blood pressure cuff, oxygen cannula and mask, religious items, skin lesions depicting Kaposi’s sarcoma, an infusing IV with secondary antibiotics, documentation for advanced directives, and a blanket from home. A written summary was given to all students involved in the scenario to transition the patient’s care from the first 2-hour scenario (the patient’s previous 10 years) to the palliative care scenario.

**Procedure**

Students were oriented to the simulation lab and informed that they would complete assessment instruments at the end of each simulation to evaluate the experience. Thirty minutes was allotted to complete the assessment instruments and was scheduled as part of the laboratory experience. Students were aware that the simulation exercises were considered clinical hours. No grades were associated with the simulation laboratory and there were no repercussions should students refuse to complete the assessment instruments. All students agreed to participate.

Students completed the assessment instruments by responding to each question using a 5-point Likert scale. Responses ranged from 1 (Strongly Disagree) to 5 (Strongly Agree/Very Important).

**Results**

Data from all four instruments are summarized in Table 2. One-way analysis of variance (ANOVA) tests were conducted to answer each research question. Tukey’s post-hoc test was used for significant F ratios to identify pair wise differences between the means for each simulation. A power analysis was conducted for all F ratios. Power ranged from 0.79 to 0.95 for all significant F ratios.

The EPSS mean scores ranged from 4.32 to 4.57, indicating that students perceived that active learning had occurred in all four scenarios (M ≥ 4). When considering pair wise differences between the means for each simulation, the mean score of student perception of active learning in the HIV-Death and Dying simulation was significantly higher (p < .05) than the other three simulations.
In assessing the importance of active learning to students, the EPSS mean scores ranged from 4.38 to 4.59. The composite mean for the four scenarios was 4.47, indicating that students perceived that active learning is important (M ≥ 4).

SDS mean scores ranged from 4.36 to 4.58 for the presence of fidelity in the four simulation scenarios. SDS scores for the importance of fidelity in the simulation ranged from 4.50 to 4.68. There were no significant pairwise differences among the means of the simulations for the measures of student’s perception of the presence or importance of fidelity.

Mean scores from the Student Satisfaction with Learning Scale instrument ranged from 4.24 to 4.54, indicating that students were satisfied with the simulation learning experience (M ≥ 4). In a pair wise analyze, the mean for the HIV-Death and Dying simulation was statistically higher (p < .05) than the means for the other three simulations for measuring student satisfaction.

Mean scores from the Self-Confidence in Learning Using Simulations Scale instrument ranged from 4.20 to 4.49. A pair wise analysis revealed that the mean for the HIV-Death and Dying simulation was higher (p < .05) than the means for the other three simulations for measuring student self confidence in learning.

**Discussion**

The study indicated that student’s perception of the presence of active learning, presence of fidelity, satisfaction with learning, and self-confidence with learning was higher for the HIV-Death and Dying scenario than the other three simulations raises the question of whether conducting a simulation with both human role-playing and a patient that died at the end of simulation experience contributed to active learning, fidelity and student self satisfaction and confidence.

Students rated the importance of active learning higher than the presence of active learning indicating students value active learning and feel it is important. Yet, the presence of active learning in all four of the scenarios was less than student expectations. Faculty must clearly delineate the simulation’s objectives, communicate objectives to the students, and incorporate active learning measures into each scenario.

The study indicated that students value fidelity and expect the simulation to be as real as possible. In all four simulations, students consistently rated the importance of fidelity higher than the actual presence of fidelity. Student perception of the importance of fidelity in conducting a simulation was high for all four scenarios. This agrees with other studies that indicate that students have greater expectations for high fidelity simulations that involve the integration of multiple concepts within the scenario (Rauen, 2004). A concerted effort should be made to replicate the clinical setting, with equal emphasis on both aspects of fidelity, psychological and physical.

The mean scores of the student’s self confidence increased with each scenario suggesting that the student’s self confidence steadily grew with each scenario as the semester progressed. Perhaps the regularly scheduled simulation experiences led to increasing the students’ comfort levels which was reflected in self confidence and satisfaction.

The simulation design template (Jeffries, 2007) and the simulation evaluation tools provided a consistent framework for the four simulations. One primary difference in the four simulations was communication techniques used during the actual simulation implementation (Table 1A). Based on the student evaluations, the communication differences were noteworthy.

### Table 2 Average Scores for Research Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Perioperative</th>
<th>Hodgkin’s Lymphoma</th>
<th>Bleeding Ulcer</th>
<th>HIV, Death and Dying</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Question 1a&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.32 0.39</td>
<td>4.37 0.42</td>
<td>4.32 0.40</td>
<td>4.57 0.45</td>
</tr>
<tr>
<td>Question 1b&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.38 0.40</td>
<td>4.51 0.45</td>
<td>4.41 0.44</td>
<td>4.59 0.44</td>
</tr>
<tr>
<td>Question 2a&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.43 0.63</td>
<td>4.42 0.57</td>
<td>4.36 0.57</td>
<td>4.58 0.52</td>
</tr>
<tr>
<td>Question 2b&lt;sup&gt;d&lt;/sup&gt;</td>
<td>4.54 0.48</td>
<td>4.50 0.50</td>
<td>4.51 0.48</td>
<td>4.68 0.45</td>
</tr>
<tr>
<td>Question 3&lt;sup&gt;e&lt;/sup&gt;</td>
<td>4.33 0.39</td>
<td>4.24 0.52</td>
<td>4.28 0.47</td>
<td>4.54 0.48</td>
</tr>
<tr>
<td>Question 4&lt;sup&gt;f&lt;/sup&gt;</td>
<td>4.20 0.41</td>
<td>4.22 0.43</td>
<td>4.28 0.45</td>
<td>4.50 0.48</td>
</tr>
</tbody>
</table>

<sup>a</sup> Question 1a: Does the student’s perception indicate that the educational practice of active learning is present during the simulation experience as measured by a mean of 4 (M ≥ 4) on the EPSS?

<sup>b</sup> Question 1b: Is active learning important to the student during the simulation experience as measured by a mean of 4 (M ≥ 4) on the EPSS items?

<sup>c</sup> Question 2a: Does the student’s perception indicate that fidelity is present in the simulation experience as measured by a mean of 4 (M ≥ 4) on the SDS items?

<sup>d</sup> Question 2b: Is fidelity important to the student during the simulation experience as measured by a mean of 4 (M ≥ 4) on the SDS items?

<sup>e</sup> What is the student’s perception related to satisfaction of the simulation learning experience as measured by a mean of 4 (M ≥ 4) on the SDS items?

<sup>f</sup> How is self-confidence in acquiring knowledge and developing skills affected by the simulation experience as measured by a mean of 4 (M ≥ 4) on the Student Self-Confidence in Learning Learning Scale?
The faculty made anecdotal observations that students became more engaged in the nurse role when role playing was used instead of SimMan. Students sometimes have difficulty viewing a manikin seriously and some introverted students have difficulty responding to a manikin. Verbal responses from the student were required during role playing. This study demonstrated that a simulation experience could reduce the need for student clinical sites, provide students with practice time that increases their comfort levels giving patient care, and maintain continuity in student clinical assignments. All students in the class were scheduled for 12 hours of simulation which relieved clinical sites of the student burden. Every student was involved in consistent scenarios, given the opportunity to practice rendering patient care, and was involved in a debriefing discussion that highlighted learning.

Recommendations for Future Study

Limitations noted during this study were that the sample included undergraduate students in one nursing course at one university. It is recommended that this study be replicated at other universities to determine if the results can be validated with a different student population.

Student roles during the simulation were not formally tracked. No correlations could be made between the student roles and the student responses on the evaluation tool. Future studies should consider tracking student responses and correlating them with specific simulation roles as nurse, family member, or observer. Self-reporting is important to consider in this study. Surveys were anonymous and no identifiable remarks were made on the surveys. Student responses were limited to the five-point Likert Scale. Evaluations considered student perceptions only. Repeating this study with students from multiple levels of undergraduate nursing courses would help validate the results.

Questions to consider for future studies include how the student’s learning style effects simulation and whether the student’s role in the simulation influences the student’s satisfaction. As students become comfortable with simulation and the teaching method, does their confidence in performing skills and interacting in the scenario increase with each simulation activity? Further research is needed to validate student confidence in simulation.

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