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Student Satisfaction with Simulation Experiences

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KEYWORDS

Human patient simulator;
patient simulator;
nursing education;
student perceptions;
simulation education;
student satisfaction

Abstract

Background: Some nursing schools use patient simulators to simulate patient scenarios.

Methods: Nursing students participated in five sessions using a patient simulator and then completed a questionnaire related to their experiences.

Results: Participants felt the experiences recreated real-life situations, tested their clinical decision-making, prepared them for the "real-life" clinical setting, and increased their confidence when in the clinical setting.

Conclusions: Patient simulator experiences enhance learning. Further research regarding student perceptions and instrument validation would contribute to an increased understanding of the use of patient simulators in nursing education.

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Student Satisfaction with Simulation Experiences

Nursing students need to learn much during their educational experiences regarding how to care for patients, and many experiences depend on the kinds of patients they care for on the units during their clinical rotations. Currently, patient simulators are used in some nursing programs. Patient simulators are computer-driven high-fidelity mannequins which can be programmed to simulate physiological changes in the cardiovascular, pulmonary, metabolic and neurological systems with changeable heart and breath sounds, and chest movement. The simulators allow students to administer simulated medications with appropriate physiological effects, and can also be programmed to physiologically respond like a real person would respond (delete) with a similar condition or disease, such as a decrease in blood pressure and increased heart rate with hemorrhage or shock. By using a patient simulator, instructors can provide students with a wide variety of patient

problems and ensure they have an opportunity to learn the appropriate care. The patient simulator experience combined with clinical practice experiences can provide students an appropriate background for their nursing career. In the past, patient simulators have been used extensively for training in anesthesia schools and now some undergraduate nursing programs augment learning experiences gained in hospitals with simulation experiences (Bearnson & Wiker, 2005). Since hospitals expect graduate nurses to have more advanced skills because of the increased patient acuity and technology, the patient simulation experiences allows students to practice these skills (Feingold, Calaluce & Kallen, 2004). However, little research has documented the use of patient simulation in nursing programs and especially student perceptions of their patient simulation experiences. Therefore, the purpose of this pilot study was to evaluate student perceptions of patient simulator experiences during their medical surgical nursing course. Hypotheses were students with simulator experiences will: (1) rate the patient simulator experience

as realistic and valuable with skills transferring smoothly into clinical situations; (2) feel confident in their nursing skills; (3) feel comfortable in clinical settings; (4) have an understanding of the role of nurses; (5) and will gain a truer clinical understanding of the situations they encountered in the simulation experience lab.

Key Points

- Respondents were very positive regarding the transferability, realism and value of the simulation experience.
- The human patient simulator appears to benefit students in their decision-making skills, technical skills, level of confidence, preparation for “real-life” settings and in reinforcing the learning occurring in class.
- More research regarding student perceptions and instrument validation is recommended.

Literature Review

Patient simulators are being used in nursing education programs at a variety of levels (Nehring & Lashley, 2004). Benefits for students involved in simulation experiences are learning in a risk-free environment, being able to experience interactive learning, having the opportunity to practice skills, and receiving feedback immediately from a faculty member or tutor (Haskvitz & Koop, 2004; McCartney, 2005; Morton, 1997; Nehring, Ellis, & Lashley, 2001). Another advantage is that the same patient problem can be presented to a number of students without risk to actual patients, and if necessary the simulation can be stopped for discussion or

to replay the scenario (Feingold, Calalupe, & Kallen, 2004; Nehring, Ellis, & Lashley, 2001). Patient simulators can also be used to prepare students to manage medical emergencies (Spunt, Foster, & Adams, 2004). Finally, Nehring & Lashley (2004) believe using patient simulators gives professors the opportunity to teach important nursing management skills and suggests schools establish the validity and reliability of scenarios used with the patient simulator.

Few quantitative studies have investigated patient simulator experiences with nursing students (Ravert, 2002). However, Bearnson & Wiker (2005) found increased student knowledge, ability and confidence in medication administration when having experience with the HPS. In addition, Peteani (2004) found students show more autonomy and self-confidence after sessions with the patient simulator when compared to students who do not have the experience. Finally, a student satisfaction survey, developed through a literature review to determine important aspects of simulation, reported nursing students found the simulations were realistic and valuable (Feingold, Calalupe, & Kallen, 2004).

Table 1 Demographics of the sample*

Characteristic	Value, No. (%)		
Sex			
Male	1 (6)		
Female	16 (94)		
Ethnicity			
Anglo/White	16 (94)		
Minority	1 (6)		
Employed in health care	2 (12)		
Unlicensed assistive personnel	2 (12)		
	Mean, Median Mode (SD)	Range	
Age, years	23.5, 21.0, 21.0 (6.19)		20-42
Grade Point Average (self-reported; 4-point scale)	3.85, 3.87, 3.9 (.07)		3.7-3.96

* N = 48; 17 surveys were returned

Sample and Method

All 48 baccalaureate students in the first medical-surgical nursing course which used the patient simulator in a lab setting were invited to participate. At the beginning of the semester, the research project was explained to the students, and they were told their decision to participate or not participate in the study would have no impact on their grade. Seventeen nursing students agreed to participate in the study. Complete demographics data are reported in Table 1. The sample was nearly all anglo/white females with an average age of 23.5 years. The self-reported grade point average was 3.8 on a 4-point grade scale. All participants had completed one semester of nursing program. One student nurse had previous experience using the patient simulator. Two participants were employed in the health care setting as unlicensed assisted personnel.

Students attended five, one-hour sessions with the patient simulator. There were four students per session, one registered nurse who facilitated and guided the session, and a research assistant who advanced the scenario and role-played the patient and medical personnel. During the sessions, the room, and the patient simulator were set-up to be as realistic as possible, by presenting patients with congestive heart failure, myocardial infarction, traumatic brain injury, diabetic ketoacidosis, and gastrointestinal bleeding. Students were given information regarding the scenario they would be working on two weeks in advance, so they would have time to prepare and read about the condition before they actually experienced it. When students arrived for their session they all received a nurses' report about the patient's condition and then chose a team leader who divided up the tasks among the students. The team leader was given the patient's chart and as a team, the students used the nursing process to care for the patient; assessing, diagnosing,

Table 2

Item	Student Responses Number (%)			
	Strongly Disagree	Disagree	Agree	Strongly Agree
1. Scenario used with the patient simulator recreates real-life situations (R)	0 (0%)	0 (0%)	8 (47.1%)	9 (52.9%)
2. Scenario adequately tests technical skills (V)	0 (0%)	1 (5.9%)	10 (58.8%)	6 (35.3%)
3. Scenario adequately tests clinical decision-making (V)	0 (0%)	0 (0%)	8 (47.1%)	9 (52.9%)
4. I was adequately prepared for the testing experience with the patient simulator (I)	0 (0%)	1 (5.9%)	12 (70.6%)	4 (23.5%)
5. Needed an orientation to working with the patient simulator before the diagnostic test (I)	0 (0%)	5 (29.4%)	9 (52.9%)	2 (11.8%)
6. The patient simulator space resembled a real critical care setting (R)	0 (0%)	2 (11.8%)	13 (76.5%)	2 (11.8%)
7. Temperature in room was comfortable (I)	0 (0%)	0 (0%)	12 (70.6%)	5 (29.4%)
8. Lighting in room was adequate (I)	0 (0%)	1 (5.9%)	11 (64.7%)	5 (29.4%)
9. Patient simulator model provides a realistic patient simulation (R)	0 (0%)	1 (5.9%)	12 (70.6%)	4 (23.5%)
10. Technical skills taught in the course are valuable (I)	0 (0%)	0 (0%)	7 (41.2%)	10 (58.8%)
11. Clinical decision making skills taught in this course are valuable (I)	0 (0%)	0 (0%)	4 (23.5%)	13 (76.5%)
12. Increased my confidence about going into the real clinical setting (T)	0 (0%)	0 (0%)	8 (47.1%)	9 (52.9%)
13. Working with the patient simulator was a valuable learning experience for me (V)	0 (0%)	0 (0%)	6 (35.3%)	11 (64.7%)
14. My interaction with the patient simulator improved my clinical competence (T)	0 (0%)	0 (0%)	8 (47.1%)	9 (52.9%)
15. Working with the patient simulator reinforced objectives of this course (V)	0 (0%)	0 (0%)	9 (52.9%)	8 (47.1%)
16. Pace reflected flow of actual clinical setting (I)	0 (0%)	4 (23.5%)	10 (58.8%)	3 (17.6%)
17. Prepared me to perform in the "real-life" clinical setting (T)	0 (0%)	0 (0%)	10 (58.8%)	7 (41.2%)
18. Received adequate feedback regarding my performance (V)	0 (0%)	4 (23.5%)	10 (58.8%)	3 (17.6%)
19. Overall the experience enhanced my learning (V)	0 (0%)	0 (0%)	6 (35.3%)	11 (64.7%)

Subscale items: (T) = transferability, (R) = realism, and (V) = value; Individual items = (I)

planning and delivering for nursing interventions, evaluating and revising the plan as needed. The students were able to view the cardiac monitor showing the heart rate, blood pressure and respiratory rate, as well as the temperature and oxygen saturation. They were also given a chart which contained the health care provider's orders and the patient's lab values. Students were able to assess breath and heart sounds, respiratory rate, and peripheral pulses as well as start intravenous catheters and administer intravenous fluids, give medications, suction, assess the urinary catheter, and insert naso-gastric tubes.

As they went through the scenario the students talked to the patient and interacted with medical staff as they cared for their patient, and the registered nurse asked thought provoking questions, lead the discussion, and answered questions. The teaching assistant role played the patient's response as well as other health care team members' responses as appropriate to the scenario. At the end of the session, students were debriefed regarding what happened, what was done well, and what could have been done better.

After the students completed the five sessions, those agreeing to participate in the study signed a consent form and completed the research instrument to analyze their perceptions. The data were entered into a statistical software program. Reliability estimates for the instrument and descriptive statistical analysis including means and frequencies were calculated.

Instrument

A 19-item student satisfaction survey, developed by Feingold, Calaluce, & Kallen (2004) used a 4-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree) to determine the extent the participants agree with the items. The instrument has three subscales: realism (n = 3), transferability (n = 3), and value (n = 6). The realism subscale contained items such as "The scenario used with the patient simulator recreates real-life situations." The transferability to clinical situation

was assessed with items such as “My interaction with the patient simulator improved my clinical competence.” The value to learning was assessed with items such as “Overall the simulator experience enhanced my learning.” The survey used 7 additional individual items related to the patient simulation experience itself.

Results

The reliability for the overall student satisfaction instrument for this sample was .86. The reliability of the subscales for this sample showed coefficient alphas of .41 for realism, .78 for transferability, and .69 for value. Initial factor analysis showed between 3-6 subscales per scree plot and eigen values >1. Even though the overall alpha was .86, the underlying subscales had low alphas which may indicate too few items or the subscales were not purposed correctly given the initial factor analysis.

The results are reported in Table 2. Sixteen of the seventeen participants felt the scenario adequately tested technical skills and prepared them for a testing experience. All respondents felt to some extent the experiences adequately tested clinical decision-making. More than 90% responded they were prepared for the testing experience, and all felt the technical skills and decision-making skills were valuable. Many (31.3%) expressed a need for an orientation before working with the patient simulator. Some participants (23.5%) perceived the pace of the clinical simulation did not reflect the flow of an actual clinical setting.

The responses were also evaluated according to the original subscales of transferability, realism, and value (see Table 3). The transferability subscale (3 items) showed all students agreed with the survey items regarding transferability, or the ability of the things done or learned in the sessions to transfer to the clinical setting. A majority (96%) of the students agreed the scenario reflected real-life situations, settings and patients as reflected in the realism subscale (3 items). Finally, nearly all (95%) participants perceived the patient simulator experiences as being valuable (6 items).

Summary and Recommendations

Overall, these nursing students found the experience enhanced their learning and helped improve their decision making skills. On the whole, respondents were very positive regarding the transferability, realism and value of the patient simulation experience. However, the pace of the simulator experience could be improved by finding a way to demonstrate the passage of time found in the hospital setting. The value could be increased by providing more feedback to students regarding their performance with the patient simulator.

Table 3 Subscale Means, Standard Deviations and Percentage of Participant Agreement (N = 17)

Subscale/Item	Mean (SD)	% of Student Agreement
Transferability subscale (T)	3.49 (1.28)	100%
Realism subscale (R)	3.25 (1.05)	96%
Value subscale (V)	3.42 (2.06)	95%

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree

The study had 2 limitations: the small sample size and the lack of psychometric testing of the instrument. This small sample, 17 out of 48, eligible participants may give a misrepresentation of the perceptions of all students. The results of this pilot study will be incorporated into a larger study over a 2-year period involving simulation education throughout the nursing curriculum. With a larger sample size, further psychometric testing will be possible and determine how to strengthen the instrument.

The use of patient simulators in nursing education is an exciting and valuable method that appears to benefit students in their decision making skills, technical skills, confidence levels, preparation for “real-life” settings, and in reinforcing the learning occurring in class.

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