FACULTY AND STUDENT PERCEPTIONS OF THE REALISM AND VALUE OF
HUMAN PATIENT SIMULATORS

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ABSTRACT

RESEARCH SUBJECT: Faculty and Student Perceptions of the Realism and Value of Human Patient Simulators

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Nursing students need to practice clinical skills and decision making in a controlled, safe environment. Human patient simulators are being used as an active teaching tool to simulate life-like patient reactions and clinical scenarios. Further investigation is needed to determine if students have a more realistic experience with making patient care decisions when utilizing human patient simulators. The purpose of this study is to determine if clinical simulations including assessments, decision making, communication, and psychomotor skills predict clinical competence for nursing students. This study is a partial replication of Feingold et al.’s (2004) study. Knowles Theory of Andragogy is the theoretical framework for this typical descriptive study. The sample will consist of two groups of 50 baccalaureate nursing students at Purdue University and two groups of two Purdue University nursing instructors during two consecutive semesters of a single academic year. Permission will be obtained from Ball State University, Purdue University, and all participants. Findings will provide information for nursing faculty regarding the value and effectiveness of using human patient simulators in nursing education.
Nursing schools are facing a problem with being able to provide safe, effective teaching strategies to novice nursing students. There has been a decreasing number of clinical sites and faculty. In addition, the nursing shortage has increased the need for nurses to be more confident and competent right out of school. According to Schoening et al. (2006), novice nurses are not adequately prepared to perform patient care when they enter the work place.

The ever-changing healthcare environment and the increasing patient acuity has created a challenge for nursing faculty to fully prepare novice nursing students (Rhodes et al., 2005). As a result, nursing schools are beginning to use human patient simulators in nursing education.

Nursing schools are utilizing human patient simulators (HPS) in curriculums at a growing rate. The increased use of human patient simulators in nursing education is due to increased student enrollment resulting from the nursing shortage, need to supplement limited numbers of clinical sites, awareness to increase patient safety, and the ability of simulation to enhance clinical practice (Seropian et al., 2004).
Human patient simulators allow students the opportunity to solve problems that the student would most likely encounter in real world nursing. As the use of HPS in nursing education grows, faculty will be able to better operate and utilize the simulators in nursing schools.

Background

Human patient simulators are state-of-the art teaching tools. According to Seropian et al. (2004) simulation has been utilized in healthcare for more than 15 years, but the use has increased drastically over the past 8 years. This teaching method provides the student with a risk free teaching environment. The students are able to identify problems, treat symptoms, and evaluate the effectiveness based on the simulators life-like reactions.

There are many different types of simulators. There are low-fidelity simulators, moderate fidelity simulators, and high fidelity simulators. Low-fidelity simulators are less life-like but they are used as a tool for the students to complete psychomotor tasks, such as, foley catheter insertions. The moderate fidelity simulators are more life-like and the student can practice listening to breath sounds, heart sounds, and feel pulses but the simulator itself does not have any life-like motion. The high-fidelity simulators have a life-like appearance that is occupied by realistic movements and sounds. They also have a more realistic ability to react to student interventions.

Human patient simulators provide a valuable teaching method. The simulators themselves can be very costly. The training that is required by the faculty and staff can also be very costly. Further investigation is needed to determine if the experience is real
and valuable to the students and worth the cost of implementing this education in nursing schools.

Problem Statement

Nursing students need to practice clinical skills and decision making in a controlled, safe environment. Human patient simulators are being used as an active teaching tool to simulate life-like patient reactions and clinical scenarios. Further investigation is needed to determine if students have a more realistic experience with making patient care decisions when utilizing human patient simulators.

Purpose

The purpose of this study is to determine if clinical simulations including assessments, decision making, communication and psychomotor skills predict clinical competence for nursing students. This study will investigate perceptions of faculty and students about the realism of scenarios using simulations and the value of the learning experiences. This is a replication of the Feingold et al.'s (2004) study.

Research questions

1. What are students' and faculty members' perceptions of patient and scenario realism?
2. Can students transfer knowledge from the simulated clinical scenario to real clinical experiences?
3. What is the value of the learning experience?

Design

The design that would be used in this study is a typical descriptive study design. This design will provide the researcher with information that could be applied to this area
where little research has been conducted. The instrument that would be used in this study would be a questionnaire.

*Definition of Terms*

*Scenario Realism*


Operational: Feingold et al. (2004) designed a student survey tool that consisted of 20 items that were formatted with a 4 point likert-type scale (4 strongly agree to 1 strongly disagree). There were 4 items that evaluated scenario realism. The four faculty members were given a 17-item survey using the same 4 point likert-type format. There were 3 questions that evaluated scenario realism.

*Scenario Transferability*

Conceptual: the extent to which the skills learned can be transferred to real clinical situations.

Operational: Feingold et al. (2004) designed a student survey tool that consisted of 20 items that were formatted with a 4 point likert-type scale (4 strongly agree to 1 strongly disagree). There were 3 items that evaluated scenario transferability. The four faculty members were given a 17-item survey using the same 4 point likert-type format. There was 1 question that evaluated scenario realism.

*Scenario Value*

Conceptual: the quality of the learning experience.

Operational: Feingold et al. (2004) designed a student survey tool that consisted of 20 items that were formatted with a 4 point likert-type scale (4 strongly agree to 1
strongly disagree). There were 6 items that evaluated scenario value. The four faculty members were given a 17-item survey using the same 4 point likert-type format. There were 4 questions that evaluated scenario realism.

**Limitations**

The are limitations in this study. The convenience sample of faculty and students is small approximately 4 faculty and 100 students. The students and faculty will all be taking the same course. The small population and only using one school will make the application to a larger population more limited.

**Assumptions**

One assumption is that the faculty members will be trained on how to properly operate the simulators and develop patient care scenarios. The second assumption is that the chosen sample will participate.

**Summary**

The need to improve the competence of the novice nurse is essential. The healthcare environment, increasing patient acuity, and increasing nurse to patient ratios are requiring that novice nurses are better prepared and able to critically think upon entry into the healthcare environment.

The educational experience that is offered through the use of human patient simulators is one-of-a-kind. There are many ways that the simulators can be used to help better educate novice nursing students.

Through further investigation and expansion of research, human patient simulators can prove to be a very efficient way to provide nursing students the education needed to prepare them for the ever-changing, complex healthcare environment.
Through further investigation nursing faculty will be able to provide a multitude of teaching experiences for their students that will more interactive and beneficial to the student.
Introduction

The literature review contains selected articles that evaluate the effectiveness, value, considerations, and experience of using human patient simulators in nursing education. The first section consists of the theoretical framework for the study. The second section relates to the value of the simulation experience. The third section explores student and faculty perceptions of simulations. The fourth section addresses the transfer of simulation to the real clinical environment.

Theoretical Framework

Knowles’ Theory of Andragogy is used as theoretical framework for this study. According to Knowles (1980) this model developed due to the growing number of research-based knowledge related to adult learning. Andragogy refers to the study of how adults learn. According to Smith (2002), Malcolm Knowles believed that adult learners acquire knowledge much differently than children.

The following are assumptions created by Malcolm Knowles in relation to his Theory of Andragogy (Knowles, 1980):
1. Adults naturally have a need to know. They take the responsibility for their own learning.

2. Adult learners have past experiences that will be used as a resource in ongoing education.

3. Adult learners become ready to learn when the content helps them complete tasks or problems more effectively.

4. Adult learners are problem centered and learn better when learning experiences are centered around real life situations.

5. A Potent motivator for adult learners is the internal need for self-fulfillment.

By using human patient simulators in nursing education, the learner has the ability to immediately apply skills to life-like scenarios. When using the simulators, the learner is engaged in hands-on, problem based learning. Knowles Theory of Andragogy supports the use of human patient simulation in nursing education.

Value of Clinical Simulation Experience

Nursing schools are beginning to utilize HPS in order to provide the students with safe, controlled, “hands-on” care. Bearnson and Wicker (2005) conducted a descriptive study that examined the benefits and limitations of using the human patient simulators (HPS) in nursing education.

The sample consisted of first year baccalaureate students that had been caring for post-operative patients 2 consecutive days in the hospital. This study was completed 5 weeks into the 6 week clinical rotation. The authors required the students to form two groups. Each group had a two hour session with the simulators. There were three simulators and the simulators all had the same surgical procedure, but all three had
different health histories. The students administered pain medication and then intervened when the simulators reacted to interventions. The learning activities that were used during this study were: selecting a pain medication, recognizing different responses to pain medication, and working as a team (Bearnson and Wicker, 2005).

The instrument used in the study was a survey that contained a Likert-type scale that had four positive statements about the session. The purpose of the scale was to measure student’s perceptions of the learning experience with the HPS. The students answered the questions by rating each question on a scale from 1-4 (4-strongly agree to 1-strongly disagree). There were three open-ended questions that asked what the student had learned, what would improve the simulated session, and whether or not the student would recommend the activity again (Bearnson and Wicker, 2005).

Results indicated the students thought that working with the simulators was a positive experience. The results of the Likert-type scale showed all questions had a mean of 3 or better. The findings were reported in mean scores to the four questions. Increased knowledge of medication side effects was 3.13. Increased knowledge of difference in patient responses had a mean of 3.31. Increased ability to administer medication safely had a mean of 3.06. Increased confidence in medication administration skills had a mean of 3.0. The open ended questions were positive and students stated that they liked being able to see and hear the different reactions by the different simulators (Bearnson & Wiker, 2005).

The conclusion of the authors was students had a more hands-on real experience and had learned a great deal from the HPS. However, a limitation to using the HPS found in the study was that only a few students at a time could utilize the simulators. The
authors indicated that more research needed to be done to identify the most productive way to utilize the HPS (Bearnson & Wiker, 2005).

Schoening et al. (2006) pointed out the many obstacles that nurse educators are confronting. There has been an increasing enrollment, decrease in the number of clinical sites, and an increase need to prepare students who are able to provide safe and competent care. From this background, the researchers conducted a non-experimental evaluation study to identify and improve upon simulation activities, learning objectives, and students’ perceptions of their experience.

A convenience sample 60 baccalaureate nursing students, who were in the second semester of their junior year, participated in this study. The students were divided into clinical groups of 7-8 students. During the last two weeks of the clinical rotation the clinical groups would rotate. One group would participate in the simulated clinical experience for the first half of the clinical day and then have on-site clinicals at the hospital for the second half. The group that had on-site clinicals the first half of the day would, then, participate in the simulated clinical experience for the second half of the clinical day. Schoening et al. (2006) used the four-phase model of simulation: orientation (students are given information about the simulator), participation (educator reviews the rules and procedures used during the simulation), simulation operation (simulated case scenario is completed), and then debriefing (the students and faculty discuss the experience).

After the two weeks of simulated clinical experience was completed, the students completed an evaluation tool that contained 10-items and were scored using a likert scale (1 strongly agree to 4 strongly disagree). Questions on the evaluation focused on critical
thinking assessment, communication, course objectives, transferability, confidence, and overall experience of the simulation. The participants were able to write any comments on the back of the evaluation tool. The participants were also encouraged to keep a journal and reflect on their thoughts about the simulation (Schoening et al., 2006).

The grand mean of the evaluation responses in regards to meeting the course objectives was 3.64. The grand mean for student’s perception of the simulation was 3.75. The qualitative data indicated that the simulation gave students more confidence, gave them the ability to see the bigger picture, and increased their comfort with decision making (Schoening et al., 2006).

Schoening et al. (2006) concluded that the quantitative data suggested that the simulated clinical experience was effective at meeting course objectives and increasing student confidence. The qualitative data suggested the participants had increased confidence, better teamwork and communication skills, and their decision making skills were enhanced in a non-threatening environment.

The National League for Nursing has conducted a study with eight participating nursing schools to gain further insight into the usefulness of simulation in nursing education (Childs & Sepples, 2006). This study was conducted at the College of Nursing and Health Professions at the University of Southern Maine, one of eight participating schools. The researchers conducted the study to explore, implement, and evaluate the use of the human patient simulators.

Through the NLN sponsorship, the school was provided with a SimMan, or a human patient simulator. The study involved 53 baccalaureate and second degree nursing students. Each session contained 12-17 students divided up into groups of four
to five. The course focused on cardiac arrhythmia and nursing interventions for patients experiencing cardiac arrhythmia. There were a total of four learning stations that increased in complexity. All students completed the four stations (Childs & Sepples, 2006).

After all stations were completed the students evaluated the experience using three different methods. The first method was by completing the Educational Practice Scale of Simulation (EPSS) which is a 16 item instrument that uses a 5 point scale to measure four educational practices present during the simulation and its importance to the learner: active learning, collaboration, diverse ways of learning, and high expectations (Childs & Sepples, 2006).

The second method was a simulation design scale (SDS), which is a 20 item scale that allows students to evaluate five features of the simulations: objective/information, support, problem solving, feedback, and fidelity. The third instrument was a 13 item scale that was USM specific that asked students to rate the level of confidence, usefulness of the simulation, and experience and feelings about the teaching method.

Results of the UMC and SDS demonstrated that students thought that feedback received during the scenarios and the information provided during the simulation was beneficial, closely followed by the complexity of the simulations. The students thought that the experience was overwhelmingly positive. The students commented on how this learning experience was more educational than any other education they have received thus far in nursing school (Childs & Sepples, 2006).

The results of the USM specific scale showed that the students learned most from the mock code situation. Students thought the noise from the other stations was
distracting. Students reported that too much content was covered during the sessions. The students thought that there needed to be more time for discussion after the sessions. The SimMan had three different voices recorded for responses, the students thought it was distracting. The students thought the groups needed to be smaller and contain only four students (Childs & Sepples, 2006).

Childs and Sepples (2006) concluded that more time is required to prepare the simulation scenarios then to prepare traditional teaching methods. The learning experiences were valuable for learning psychomotor skills and critical thinking. There needed to be more time allotted during the scenarios. The instructors needed to provide feedback during the scenarios. The student groups needed to be small, and there also needed to be minimal outside noise during the scenario sessions. The researchers indicated this experience and feedback could provide guidance for future use of the human patient simulator (Childs & Sepples, 2006).

The increased need for interactive medical education has increased the use of human patient simulators in many areas, such as, emergency medicine, radiology, pediatrics, neonatology, trauma, nursing, and other allied health fields (Huang et al., 2006). Although the use of simulation in education has been highly reviewed, there has been minimal research that supports the use and effectiveness of simulated education. Huang et al. (2006) completed a prospective randomized trial study to evaluate if full scale high fidelity simulation is more effective than problem based learning.

The study involved 31 fourth year medical students enrolled in an acute care course. All participants took part in the same lectures. After the lectures the participants were divided into two groups. One group was labeled the “PBL” (problem based
learning) group and contained 16 of the participants. The other group was labeled “SIM” (simulator) and had 15 participants (Huang et al., 2006).

After the groups were formed, all of the participants from both groups received an orientation with the simulator and equipment. After the orientation the participants all had to work through acute scenarios with the simulator. During the scenarios two raters assessed the students using predetermined standardized check-lists. The goal of this assessment was to obtain the initial baseline of the participant’s skills and to ensure that the groups were equivalent in their acute care skill level. The results of the assessment indicated that there was no significant difference between the two groups (Huang et al., 2006).

After the initial assessment, both groups had one problem based learning session and one simulation based learning session. The topics that were discussed in the sessions were abdominal pain and dyspnea. The problem based learning sessions and the simulation based learning sessions all had the same learning objectives and scenarios. The PBL group reviewed dyspnea by using the problem based learning method and reviewed abdominal pain by using the simulation method. The SIM group reviewed dyspnea by using the simulation method and reviewed abdominal pain by using the problem based learning method. Both groups spent an equal amount of time on both topics (Huang et al., 2006).

After the two groups completed both learning sessions, both groups underwent a final assessment. The final assessment covered the management of dyspnea using the simulator. All participants in both groups had to independently complete a simulated scenario lasting 5-7 minutes. All of the scenarios were different. All participants were
scored using a standardized checklist similar to the checklist used in the initial assessment (Huang et al., 2006).

The results from the final assessment indicated that the SIM group performed significantly better. The assessment demonstrated a 25% improvement in the SIM group from the initial assessment and an 8% improvement in the PBL group from the initial assessment (Huang et al., 2006).

Huang et al. (2006) concluded that the study reflected an improvement of skill acquisition in participants who were trained using the simulation during the dyspnea session over the participants trained in problem based learning session. The results indicate that simulation is an effective teaching tool when teaching clinical skills (Huang et al., 2006).

Alinier et al. (2003) argued that increased concern for patient safety and cost reduction due to human error is resulting in increased use and development of simulation technology in nursing education. In order to justify the costs that are attached with using simulation technology in education, there has to be studies that provide supportive evidence that show increased knowledge and skill attainment of students when using simulation in education. Alinier et al. (2003) conducted a quasi-experimental study to test the effectiveness of using HPS in nursing education.

Alinier et al. (2003) selected second year students from a diploma nursing program as the population of the study. A voluntary sample was formed from the group of students, a control and experimental group. The control group consisted of 38 students, 21.1% male and 78.9% female. The average age of the participants in the group was
The experimental group consisted of 29 students, 20.7% male and 79.3% female. The average age of all participants was 29.41.

The first part of the study took place before the control and experimental groups were formed. All students completed an objective structures clinical examination (OSCE). The examination is a tool approved to evaluate the student’s skills at 15 stations using simulation technology. After the students completed the examination, students were then divided into groups. The control group took the course using the traditional teaching methods not involving simulations. The experimental group used simulation technology 2 times covering the same course content as the control group (Alinier et al., 2003).

Four months after the initial OSCE test was completed, both groups took a confidence questionnaire. The questionnaire was used to evaluate demographic information, confidence level, and stress level when using technology. After the confidence test was completed, both groups of students completed the second OSCE test (Alinier et al., 2003).

The results from the first OSCE test were that the competence level of both groups was similar. The control group had a competence level of 49.59% and the experimental group had a competence level of 50.19%. The second OSCE test demonstrated that the experimental group had a higher competence level than the control group. The experimental group had 63.62% level of competence and the control group had 56.35% level of competence. The experimental group improved competence by 13.43% and the control increased their competence level by 6.76% (Alinier et al. 2003).
Alinier et al. (2003) concluded that the findings support the use of simulation in education. The researchers also suggested that the technology is only effective if it is utilized appropriately by faculty educated to use simulation. Simulation technology does improve clinical skills.

From a review of the literature, Treloar (2001) found without using emergency medical skills frequently, often those skills are lost. Subsequent research was conducted to assess the effectiveness and ability of training emergency medical personnel using human patient simulators.

A convenience sample of 8 emergency medical technicians and 10 physicians comprised the sample for this study. The participants were separated into 2 and 4 person groups. Each participant had training using the HPS. All participants completed a pre-test that measured efficacy and preparedness using a five point likert scale prior to the simulation (Treloar, 2001).

During the simulation, all groups were involved in 5 scenarios with the human patient simulator. Each scenario lasted 10 minutes. Each group had a total of an hour using the HPS. After the completion of the scenario, each participant completed a post-test that contained all of the items on the pre-test but also included additional items that focused on the participant’s perception of using the HPS. All tests were scored by using a likert scale (1 strongly disagree to 5 strongly agree) (Treloar, 2001).

The results reflected a significant overall improvement after the scenario in preparedness. The mean scores were as follows: usefulness of the HPS 4.75, improvement of skills 4.75, increase confidence levels 4.37, HPS training should be required 4.5, training with a HPS is better than with a mannequin 4.88 (Treloar, 2001).
The researchers concluded that using the human patient simulator increased the confidence levels of the participants. An extra benefit of using the human patient simulators was the ability to practice skills with no time constraints (Treloar, 2001).

At the time of their research, Nehring & Lashley (2004) found many nursing programs had just begun using simulation technology. There had been little exploration as to how simulation could be used in instruction. The researchers, thus, conducted a quantitative and qualitative study to investigate the use and training involved in using HPS in nursing education.

Nehring and Lashley (2004) sent out surveys to 66 nursing programs and 150 simulation centers, hospitals, and other higher education institutions for this investigation. Thirty-four nursing schools and six simulation centers responded to the survey. Of the 34 nursing schools (82%) were public schools and 18% were private schools. Twelve of the schools offered baccalaureate and graduate degrees and 11 offered associate degrees. Of the 34 nursing schools, 16 were community colleges and 18 were universities.

Nehring and Lashley (2004) used a researcher designed 37-item closed and open-ended survey. The first seven questions addressed demographic information and the remaining questions covered the following topics: curricular content or courses using HPS, percentages of faculty using HPS, evaluation of competency, continuing education, other uses of the HPS in nursing education, student opinions, evaluation, topics from community sample, topics from university sample, and simulation sample.

Results of curricular information included percentages of time devoted to HPS in the curriculum and courses that used the HPS. The findings indicated that the community
college programs used HPS more in most courses except maternal-newborn. The HPS was used in advanced medical-surgical courses most often in the community college sample. Universities used the HPS most often in basic skills courses. HPS were only used in 6 of the 18 graduate programs. The graduate programs used HPS in physical assessment and nurse anesthesia courses. Most correspondents used HPS as a part of clinical time (57.1%) and 42.9% used HPS rarely or never as clinical time (Nehring & Lashley, 2004).

The results of faculty time and use reflected that 93.8% of the schools had only 25% or less of the faculty using HPS. A majority of the schools (75.8%) had one person designated as responsible for running the simulator. The person responsible for running the simulator was a faculty member in 65.4% of the schools, a faculty member from another discipline 15.4% of the time, a nursing staff member 11.5% of the time, or a staff member from another school 7.7% of the time. A majority of the schools (94%) offered no extra monetary compensation for running the HPS, only one program offered extra salary. Only three respondents provided release time and two respondents offered additional perks. The respondents (20%) stated faculty had personal satisfaction in learning and using the technology (Nehring and Lashley, 2004).

The next area addressed receptivity of using the HPS in nursing courses. Nehring & Lashley (2004) noted that 58.1% of faculty were generally receptive to using the technology, 29% noted that faculty thought HPS was suited only for certain courses, and three schools indicated that their faculty were not receptive to the technology. The authors included reasons that made staff non-receptive to HPS: fear of technology, change of methodology, perception of technology being too advanced, perception that the
level of nursing students was not high enough for this type of technology, a relatively small number of students can use the technology at the same time, and time needed to learn the technology.

The results of student opinions regarding the HPS were collected by 65.6% of the schools. Evaluation by the students of the technology was gathered using course evaluations, surveys, and verbal reports. The students embraced this form of technology and enjoyed the benefits, but felt anxiety when demonstrating the skills in front of peers (Nehring & Lashley, 2004).

The next section of the questionnaire involved the use of HPS in competency evaluation. According to Nehring & Lashley (2004), 41.9% of the schools stated HPS should be used for the evaluation of competency in the undergraduate programs. Faculty (35.5%) thought that the HPS could be used in some circumstances of evaluation, and 7% thought the HPS should not be used for competency evaluation. The respondents commented that the HPS was useful for developing critical thinking skills, applying theory into practice, providing a better transition to clinical experience, and providing a safe, simulated experience. The researchers found that schools were still learning how to use simulators and that current use of the simulators was largely in undergraduate physical assessment, advanced undergraduate medical/surgical, graduate physical assessment, and nurse anesthesia courses.

The next section of the questionnaire queried how many schools owned HPS. Of the schools, 68.8% of the universities and 71.4% of community college programs owned a HPS. If schools did not own their own equipment, nursing schools used borrowed
simulators from outside organizations which can cost $15-$135 an hour (Nehring & Lashley, 2004).

The findings indicated that the HPS was used more often in community college programs. According to Nehring and Lashley (2004) limitations for the use of HPS is the complexity and time needed to become oriented in the technology and the fear of the faculty to learn the technology. Results showed that budgetary limitations and incentives are scarce for faculty to implement this technology.

**Student and faculty perceptions of simulations**

Bremner et al.’s 2006 study evaluated specific student responses regarding the use of HPS in a simulated clinical scenario. Currently the HPS is being used in a variety of educational settings, including nurse anesthetist programs, medical schools, and nursing schools. One important aspect in nursing education is developing the best uses for the HPS in order to promote the best acquisition of clinical skills to the novice nurse. The purpose of this study was to determine the value of HPS technology in nursing education from the perspective of the nursing student. The study focused on four areas: teaching/learning utility, realism of the HPS, limitations to the HPS methodology, and the students’ confidence and comfort with the use of the HPS in teaching assessment skills during clinical scenarios.

The sample consisted of 56 novice nursing students in a baccalaureate program. The procedure required the students to perform a head-to-toe assessment of the HPS. After the initial head-to-toe assessment was completed, the faculty members programmed changes into the HPS. The student then completed another head-to-toe assessment noting any changes from the original assessment (Bremner et al., 2006).
After the final assessment was completed, 41 of the 56 nursing students completed a 2-part questionnaire about the experience. The first part of the questionnaire identified the following areas: students’ overall perceptions of the experience, if the experience should be mandatory or voluntary in the curriculum, if the experience gave them confidence in assessment skills, if the HPS experience relieved stress on the first day of clinical, and if the session made the student less anxious on the first day of clinical. The second part of the questionnaire requested comments in written format from the students (Bremner et al., 2006).

The results from the quantitative part of the questionnaire demonstrated 95% of the students rated the session from good to excellent, 68% indicated that the HPS should be used on a mandatory basis in the nursing education program, 61% thought the experience increased confidence with their assessment skills, and 42% found using the HPS relieved some stress on the first day of clinical (Bremner et al., 2006).

The open-ended responses were reviewed and general themes were identified: teaching/learning utility, realism, limitations, and comfort/confidence. Following are descriptions of student perceptions within each of the general theme areas. Within the theme of teaching and learning utility, student perceptions included the following: 29% thought HPS was great for learning heart sounds, 22% for hands-on experience, 20% learning and remediation without risk, and 5% motivation to practice. Within the theme of realism, student perceptions included the following: 24% thought it was very realistic, 2% believed it was not realistic. Within the theme of limitations, student perceptions included the following: 15% not enough time, 5% group learning, 2% scary appearance. Within the theme of comfort and confidence, student perceptions included the following:
2% comfort in touching patients, 2% confidence in head-to-toe assessment (Bremner et al., 2006).

The qualitative data revealed that the students believed this experience was beneficial to their education. The qualitative responses included participant’s realization of the needed practice in assessment skills, increased comfort level, and confidence gained through the simulated experience (Bremner et al., 2006).

Bremner et al. (2006) concluded that purposes of these methodologies were to stimulate critical thinking, provide real world experiences without risk to patient or student, and to diminish student anxiety in new situations. The simulators provided a diverse education format valuable to nurse educators when enhancing comfort, confidence, and skill in novice nursing students.

Rhodes & Curran (2005) argued that nurse educators are challenged at providing students with adequate clinical experience. The researchers explored the benefits of using human patient simulators as an educational tool to enhance knowledge and skill acquisition, decrease anxiety, and to promote clinical judgment in a safe, controlled environment.

Twenty-one senior level students who were participating in an acute medical surgical course volunteered to participate in this study. Two faculty members also volunteered to participate in the study. The students were divided up in groups of four to five students. Each group participated in the same simulation experience only at different times. The simulation experience contained 10 minutes of pre-simulation orientation, then a 20 minute simulated scenario, followed by a 20 minute period of group debriefing, then a 30 minute evaluation of the entire simulated experience. The simulated case
scenario focused on a patient experiencing hemorrhagic shock. All scenarios were videotaped and then reviewed by the students after the simulation was completed (Rhodes & Curran, 2005).

After the debriefing the students completed a 13-item survey. The survey evaluated the student’s perception of the simulated clinical experience. The summarized results from the survey indicated that the students thought the experience was positive and beneficial. The students reported that they found it difficult to treat the simulator as a real patient, but overall the experience was realistic. The students reported that there were too many students in each group, the scenarios felt disorganized, and too short. The students thought that the scenario promoted critical thinking. The students would recommend the use of human patient simulators in undergraduate programs (Rhodes & Curran, 2005).

There has been an increase in the use of HPS in nursing education. The goal of using HPS is to provide a safe, controlled environment for students to learn skills and to be able to transfer those skills into real-life situations. Feingold et al. (2004) conducted a study to evaluate students’ and faculty members’ perceptions regarding the use of HPS.

The population of this study was baccalaureate nursing students participating in an advanced acute care of an adult course. The first sample consisted of 50 nursing students enrolled in the advanced acute care of the adult course during the fall semester. The second sample consisted of 47 nursing students enrolled in the same course during the consecutive spring semester. There were four faculty members that took part in the study; they participated in both the fall and spring courses (Feingold et al., 2004).
The students enrolled in the fall semester had two clinical experiences using the HPS. After the semester was completed, the 50 students were given a survey tool that consisted of 20 items that were formatted in a 4 point likert-type scale. The items on the survey evaluated the value of the experience, transferability of the skills, realism of the simulation, and value of the learning experience. There were 28 students of the 50 that responded to the survey during the fall semester. The second sample of students in the spring was given the same tool and 37 of the 47 students responded. The total response rate was 67%. The four faculty members were given a 17-item survey using a 4 point likert-type format to evaluate experience in relation to faculty support, training, and perceived educational experience. All four faculty members responded to the survey (Feingold et al. 2004).

Feingold et al. (2004) combined the results from the returned student surveys. The results were divided into four categories: transferability, realism, value, and individual items. The transferability category resulted in the following: 50% of the students who thought the skills learned could be transferred to real-life situations. Realism resulted in 73% of the students thought the pace and flow was real. The vast majority of the students (92.3%) thought that the experience was valuable. The individual category contained the following items: 70.8% of students were prepared to test skills with the HPS after being educated on how to use the HPS, 100% thought that the decision making was valuable, and 100% thought skills learned were valuable.

The results of the faculty survey indicated that 100% of faculty thought the experience prepared students to transfer knowledge to the real-life setting. All the faculty (100%) thought the scenario was realistic, and 100% thought the HPS was an effective
teaching tool. Most faculty (75%) thought that using the HPS would require extra preparation time for clinical, and most (75%) responded that there was inadequate faculty support for using the simulation technology which resulted in less usage (Feingold et al., 2004).

Feingold et al. (2004) concluded that findings reflected the value of using HPS in nursing education for both faculty and students. The learning experience was valued by the students. The researcher concluded that simulation was a safe way to educate novice nursing students on important clinical skills before entering into the real acute care setting.

*Simulation transfer to clinical*

Gorman et al. (2001) conducted a study to investigate the impact of using human patient simulators along with the advanced trauma life support class (ATLS) on the trauma management skills and self-confidence levels in surgical interns. This study was conducted to enhance the opportunities for future surgical interns.

The study consisted of 12 surgical interns. The participants had no experience with the ATLS class. The 12 interns were divided up into three groups. At different times, each group completed two trauma scenarios using the human patient simulator. After all groups completed the simulated scenarios they participated in the 2-day ATLS class. After the ATLS class was completed, the students then repeated the two trauma simulations that they had completed prior to taking the class (Gorman et al., 2001).

Prior to the start of the course the interns all completed a self-confidence survey that reflected the interns’ self-confidence related to specific trauma management skills. The survey contained 20 items that were answered using a likert scale (1-no confidence
to 10-full confidence). After the course and two simulation sessions were completed, the interns completed the same confidence survey. Along with the confidence survey they also completed a 15 item survey with likert scale questions (1-most negative to 10 most positive) that addressed perceived relevance of trauma, effectiveness of the sessions in establishing active learning, and the transferability of practical clinical information to real clinical situations (Gorman et al., 2001).

Results of the survey indicated that the critical treatment decision score rose 24% after the course, performance related to potential for adverse outcomes rose 25%, and the interns team behavior score rose 47%. The intern’s mean confidence level rose from 5.8 +/- 0.9 prior to the course to 8.1 +/- 0.5 after the completion of the course. The entire evaluation of the human patient simulator was 8.3 out of 10. The qualitative feedback provided by the students was that the simulated experience felt real and had much value when compared to real clinical situations (Gorman et al., 2001).

Gorman et al. (2001) concluded that the use of human patient simulation along with the class significantly improved performance of all three trauma management skill areas. In conclusion, human patient simulators addressed adult learning needs by providing an interactive environment and by demonstrating skills that can easily be transferred to clinical situations.

Staudenmayer et al. (2008) argued that the shortening of resident work hours and the need to provide patient safety in the medical field has caused changes in surgical education. From these rationales, the researchers conducted a study to evaluate the use of simulation in a scenario-based curriculum used to educate surgical interns.
The population consisted of 18 midlevel surgical residents. The residents were divided into two groups. One group received the scenario-based education in didactic sessions only. The other group received the scenario-based education in simulation enhanced teaching sessions (Staudenmayer et al., 2008).

After the residents completed the education, all 18 participants completed a survey that evaluated only the content presented in the sessions. The survey contained likert-type questions (1 strongly disagree to 5 strongly agree). Replies from both the didactic and simulation group were very similar. The simulation participants also completed an additional evaluation tool that contained 3 items evaluating the simulation. All items were answered using the same likert-scale format. The average score for the realism of the simulation was 4, practicing skills 3, and value of debriefing was 5 (Staudenmayer et al., 2008).

The last part of the program evaluation took place in the emergency room. A total of 10 participants, 6 who were part of the simulation group and 6 who were part of the didactic group, were videotaped during actual code situations. Each participant had a total of four codes videotaped. There were 16 videotaped codes for the didactic group and 24 videotaped codes for the simulation groups. All twenty-four of the videotaped codes were reviewed and scored by two trained professionals using an objective tool that evaluated numerous aspects of the code (Staudenmayer et al., 2008).

The overall assessment scores reflected that most residents in both groups received an overall adequate score (simulation group: 59% +/- 6%, the didactic group 66% +/- 5%). The simulation group received fewer poor/failed scores (simulation 25% +/- 0%, the didactic group 29% +/- 13%). The simulation group also received more
excellent scores (simulation 17% +/- 6%, the didactic group 6% +/- 8%). Results indicated that the simulation participants scored consistently higher throughout all of the areas of actual clinical experience: teamwork, decision making, and situation awareness (Staudenmayer et al., 2008).

Staudenmayer et al. (2008) concluded that the simulation presents a different experience for surgical residents. Curriculum involving simulation has a major impact on developing behavioral skills that are required for successful clinical management of patients.

**Summary**

The literature review reveals that using human patient simulation in nursing education is beneficial. Malcolm Knowles has provided a theory that supports the need of simulation based on his Theory of Andragogy. Nursing students are adult learners and based on the theoretical assumptions of Malcolm Knowles, simulation provides all of the elements needed to provide the most effective teaching strategy to adult learners (Knowles, 1980).

The literature review revealed mixed feedback related to patient and scenario realism. The study conducted by Bearnson and Wicker (2005) reported that the students felt they had hands-on real experience during the simulated scenarios. Bremner et al. (2006) reported that 24% of the students thought that the scenarios were realistic, whereas, only 2% though the scenarios were unrealistic. Rhodes & Curran (2005) reported that qualitative feedback indicated that the students found it hard to treat the simulator as a real patient, but, overall, thought that the simulated experience was realistic. Feingold et al. (2004) reported that 73% of the students thought that the pace
and flow of the scenario was realistic and 100% of the faculty thought the experience was realistic.

The literature review supported the transferability of skills learned by simulation to the real clinical setting. Bearson & Wicker (2005) reported that after the simulation the student’s medication knowledge, medication administration safety, and confidence increased. The results of Schoening et al.’s (2006) study reflected that participants had increased confidence, better teamwork, and communication skills. The participants demonstrated better decision making skills after working with the simulation as well.

Huang et al. (2006) reported that participants who experienced a learning session using simulation performed significantly better with assessments than participants who did not experience simulation sessions. Feingold et al. (2004) reported that 50% of the participants thought that the skills learned in the simulation experience could be transferred to the real clinical setting and 100% of the staff reported that the skills learned during the simulation could be transferred to the real setting.

All of the studies reviewed in this section indicated that participants who had a simulated clinical experience had an overall increased improvement in skills over participants who did not participate in the simulated clinical experience. According to the results, faculty more than students, believe that the knowledge and practice gained during simulation can be transferred to the clinical setting (Feingold et al., 2004).

The literature review revealed that both faculty and students valued the simulated learning experience. As evidenced by the literature, all studies in this section reported an improvement in the student’s skills after the simulation experience. Gorman et al. (2001) reported that students thought the simulated clinical experience was valuable. The
participants in Treloar’s 2001 study recommended that the simulator be used in routine military training. Bremner et al. (2006) reported the qualitative data results from their study indicated that the students thought the simulated clinical experience was beneficial to their education. Feingold et al. (2004) reported that 92.3% of the student’s thought that the simulated clinical experience was valuable and 100% of faculty thought that it was an effective teaching tool.

The use of HPS in nursing education is growing. It is essential to continue research on HPS in order to provide nursing students with safe, effective learning methods. The research reflects that are set-backs involved with using this technology, such as, required time of the faculty, money needed to obtain the equipment, and fear still attached to the use of technology. The research does provide some evidence that using HPS as a teaching method does enhance clinical skills that can not be enhanced with traditional teaching methods. The research indicates that the majority of students like this teaching method and agree that it prepares them better for real-clinical experience. Overall, the literature shows both faculty and students value the learning experience of using the HPS.
<table>
<thead>
<tr>
<th>Source</th>
<th>Problem, Purpose, and Research Questions</th>
<th>Framework or Concepts</th>
<th>Sample</th>
<th>Design</th>
<th>Instruments</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bearson &amp; Wicker (2005)</td>
<td><strong>Problem:</strong> Nursing schools are beginning to provide the students with safe, controlled, “hand-on” care by using human patient simulators. <strong>Purpose:</strong> Examine the benefits and limitations of using human patient simulators in nursing education.</td>
<td>No identified theoretical/conceptual framework</td>
<td>First year baccalaureate students who were in their 5th week of a 6 week post-operative clinical rotation at Brigham Young University. Number of students not identified.</td>
<td>Descriptive Study Design</td>
<td>A survey created by the researchers that contained four positive statements that were answered with a likert-type scale and three open-ended questions that asked what the students learned, what they would improve, and if they recommended the simulation be used again.</td>
<td>Results indicated the students thought that working with the simulators was a positive experience. The results of the Likert-type scale showed all questions had a mean of 3 or better. The findings were reported in mean scores to the four questions. Increased knowledge of medication side effects was 3.13. Increased knowledge of difference in patient responses had a mean of 3.31. Increased ability to administer medication safely had a mean of</td>
</tr>
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</table>
2. Shoening et al. (2006)

**Problem:**
There are many obstacles that nurse educators are confronting. There has been an increasing enrollment, decrease in the number of clinical sites, nonidentified theoretical/conceptual framework, and decrease in the number of clinical sites.

**Design:**
A convenience sample of 60 baccalaureate nursing students who were in the second semester of their junior year.

**Nonexperimental Pilot Study Design:**
A survey that contained 10-items and were scored using a likert scale (1 strongly agree to 4 strongly disagree). Questions on the survey focused on critical thinking assessment, communication, course objectives, transferability, confidence, and overall experience of the simulation.

The grand mean of the evaluation responses in regards to meeting the course objectives was 3.64. The grand mean for student’s perception of the simulation was 3.75. The qualitative data included increased confidence in medication administration skills, with a mean of 3.0. The open-ended questions were positive, and students stated that they liked being able to see and hear the different reactions by the different simulators.
and an increase need to prepare students who are able to provide safe and competent care.

**Purpose:** to identify and improve upon simulation activities, learning objectives, and students’ perceptions of their experience.

Simulation. The toll included an open-ended comment section. The participants were also encouraged to keep a journal and reflect on their thoughts about the simulation.

indicated that the simulation gave students more confidence, gave them the ability to see the bigger picture, and increased their comfort with decision making.

<table>
<thead>
<tr>
<th>Problem:</th>
<th>Simulation Model Design for the NLN/Laerdal Study</th>
<th>53 baccalaureate and second degree nursing students.</th>
<th>Descriptive Study Design</th>
<th>The first instrument was the Educational Practice Scale of Simulation (EPSS) which is a 16 item instrument that uses a 5 point scale to measure four educational practices present during the experience was positive. Results of the UMC demonstrated that students thought that feedback and</th>
</tr>
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</table>
build self confidence, and improve critical thinking skills. **Purpose**: To explore, implement, and evaluate the use of the human patient simulators.

<table>
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<tr>
<th>simulation and its importance to the learner: active learning, collaboration, diverse ways of learning, and high expectations. The second instrument was a simulation design scale (SDS), which is a 20 item scale that allows students to evaluate five features of the simulations: objective/information, support, problem solving, feedback, and fidelity. The third instrument was a 13 item scale that was USM specific that asked students to rate the level of confidence, usefulness of the simulation, and experience and feelings about the teaching method.</th>
</tr>
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<tbody>
<tr>
<td>objective information provided during the simulation was beneficial, closely followed by the complexity of the simulations The results of the USM specific scale showed that the students learned most from the mock code situation. Students thought the noise from the other stations was distracting. Students reported that too much content was covered during the sessions. The students thought that there needed to be more time for discussion.</td>
</tr>
</tbody>
</table>
The SimMan had three different voices recorded for responses, the students thought it was distracting. The students thought the groups needed to be smaller and contain only four students.

| 4. Huang et al. (2006) | **Problem:** Although the use of simulation in education has been highly reviewed, there has been minimal research that supports the use and effectiveness of simulated education. | No identified theoretical/conceptual framework | 31 fourth year medical students enrolled in an acute care course. | Prospective Randomized trial study | Two raters assessed the students using researcher developed predetermined standardized check-lists. | The results from the final assessment indicated that the SIM group performed significantly better. The assessment demonstrated a 25% improvement in the SIM group from the initial assessment and after the sessions. |
| **Purpose:** To evaluate if full scale high fidelity simulation is more effective than problem based learning. | **Problem:** Increased concern for patient safety and cost reduction due to human error is resulting in increased use and development of simulation technology in nursing education. **Purpose:** In order to justify the costs that are attached with using | **Problem:** No identified theoretical/conceptual framework | **Methodology:** All students completed an objective structures clinical examination (OSCE). The researcher designed examination is a tool approved to evaluate the student’s skills at 15 stations using simulation technology. Four months after the initial OSCE test was completed, both groups took a confidence questionnaire. The questionnaire was used to evaluate demographic information, confidence level, and stress level when using technology. **Results:** The results from the first OSCE test were that the competence level of both groups was similar. The control group had a competence level of 49.59% and the experimental group had a competence level of 50.19%. The second OSCE test demonstrated that the experimental group had a higher |

5. Alinier et al. (2003)

| **Purpose:** To evaluate if full scale high fidelity simulation is more effective than problem based learning. | **Problem:** Increased concern for patient safety and cost reduction due to human error is resulting in increased use and development of simulation technology in nursing education. **Purpose:** In order to justify the costs that are attached with using | **Problem:** No identified theoretical/conceptual framework | **Methodology:** All students completed an objective structures clinical examination (OSCE). The researcher designed examination is a tool approved to evaluate the student’s skills at 15 stations using simulation technology. Four months after the initial OSCE test was completed, both groups took a confidence questionnaire. The questionnaire was used to evaluate demographic information, confidence level, and stress level when using technology. **Results:** The results from the first OSCE test were that the competence level of both groups was similar. The control group had a competence level of 49.59% and the experimental group had a competence level of 50.19%. The second OSCE test demonstrated that the experimental group had a higher |
| 6. Treloar (2001) | **Problem:** without using emergency medical skills frequently, often those skills are lost. | No identified theoretical/conceptual framework | 8 emergency medical technicians and 10 physicians. | Descriptive Study Design | Pre-test that measured efficacy and preparedness using a five point likert scale prior to the simulation. After the completion of the scenario, each  | The results reflected a significant overall improvement after the scenario in preparedness. | After the confidence test was completed, both groups of students completed the second OSCE test. | competence level than the control group. The experimental group had 63.62% level of competence and the control group had 56.35% level of competence. The experimental group improved competence by 13.43% and the control increased their competence level by 6.76% |
| Purpose: To assess the effectiveness and ability of training emergency medical personnel using human patient simulators. | Participant completed a post-test that contained all of the items on the pre-test but also included additional items that focused on the participant’s perception of using the HPS. | 7. Nehring & Lashley (2004)  
**Problem:** Many nursing programs have just begun using simulation technology. There has been little exploration as to how the simulation can be used in instruction.  
**Purpose:** investigate the no identified theoretical/conceptual framework  
Thirty-four nursing schools and six simulation centers  
Descriptive Study Design  
A researcher designed 37-item closed and open-ended survey. The first seven questions addressed demographic information and the remaining questions covered the following topics: curricular content or courses using HPS, percentages of faculty using HPS, evaluation of competency, continuing education, other uses of the HPS in nursing education, student |
use and training involved in using HPS in nursing education.

The HPS most often in basic skills courses. HPS were only used in 6 of the 18 graduate programs. The graduate programs used HPS in physical assessment and nurse anesthesia courses. Most correspondents used HPS as a part of clinical time (57.1%) and 42.9% used HPS rarely or never as clinical time. The results of faculty time and use reflected that 93.8% of the schools had only 25% or less of the faculty using HPS. A majority of the schools

| use and training involved in using HPS in nursing education. | opinions, evaluation, topics from community sample, topics from university sample, and simulation sample. | the HPS most often in basic skills courses. HPS were only used in 6 of the 18 graduate programs. The graduate programs used HPS in physical assessment and nurse anesthesia courses. Most correspondents used HPS as a part of clinical time (57.1%) and 42.9% used HPS rarely or never as clinical time. The results of faculty time and use reflected that 93.8% of the schools had only 25% or less of the faculty using HPS. A majority of the schools |
(75.8%) had one person designated as responsible for running the simulator. The person responsible for running the simulator was a faculty member in 65.4% of the schools, a faculty member from another discipline 15.4% of the time, a nursing staff member 11.5% of the time, or a staff member from another school 7.7% of the time. A majority of the schools (94%) offered no extra monetary compensation for running the HPS,
only one program offered extra salary. Only three respondents provided release time and two respondents offered additional perks. The respondents (20%) stated faculty had personal satisfaction in learning and using the technology. Faculty (58.1%) were generally receptive to using the technology, 29% noted that faculty thought HPS was suited only for certain courses, and three schools indicated that their faculty were
The Reasons that made staff non-receptive to HPS:

- fear of technology,
- change of methodology,
- perception of technology being too advanced,
- perception that the level of nursing students was not high enough for this type of technology,
- a relatively small number of students can use the technology at the same time,
- and time needed to learn the technology.

The results of student opinions include: [Table content goes here]
regarding the HPS were collected by 65.6\% of the schools. The students embraced this form of technology and enjoyed the benefits, but felt anxiety when demonstrating the skills in front of peers. Schools (41.9\%) stated HPS should be used for the evaluation of competency in the undergraduate programs. Faculty (35.5\%) thought that the HPS could be used in some circumstances of evaluation, and 7\% thought the
HPS should not be used for competency evaluation. The respondents commented that the HPS was useful for developing critical thinking skills, applying theory into practice, providing a better transition to clinical experience, and providing a safe, simulated experience. Of the schools, 68.8% of the universities and 71.4% of community college programs owned a HPS. If schools did not own their own
| 8.Bremner et al. (2006) | **Problem:** The need to develop the best uses for HPS in order to promote acquisition of skills in the novice nurse. | **Purpose:** To determine the value of HPS technology in nursing education from the perspective of the nursing student. | No identified theoretical/conceptual framework | 56 novice nursing students in a baccalaureate program. | Descriptive Study Design | 2-part questionnaire about the experience. The first part of the questionnaire identified the following areas: students’ overall perceptions of the experience, if the experience should be mandatory or voluntary in the curriculum, if the experience gave them confidence in assessment skills, if the HPS experience relieved stress on the first day of clinical, and if the session made the student less anxious on the first day of clinical. | Of the students (95%) rated the session from good to excellent, 68% indicated that the HPS should be used on a mandatory basis in the nursing education program, 61% thought the experience increased confidence with their assessment skills, and 42% found using the HPS relieved stress on the first day of clinical. | equipment, nursing schools used borrowed simulators from outside organizations which can cost $15-$135 an hour. |
day of clinical. The second part of the questionnaire requested comments in written format from the students.

some stress on the first day of clinical. Of the students 29% thought HPS was great for learning heart sounds, 22% for hands-on experience, 20% learning and remediation without risk, and 5% motivation to practice. Student perceptions included the following: 24% thought it was very realistic, 2% believed it was not realistic. Within the theme of limitations, student perceptions included the following: 15% not enough time, 5% group
learning. 2% scary appearance. Within the theme of comfort and confidence, student perceptions included the following: 2% comfort in touching patients, 2% confidence in head-to-toe assessment. The students believed this experience was beneficial to their education. Responses included participant’s realization of the needed practice in assessment skills, increased comfort level, and confidence gained through the simulated
<p>| 9. Rhodes &amp; Curran (2005) | <strong>Problem:</strong> Nurse educators are challenged at providing students with adequate clinical experience. <strong>Purpose:</strong> To explore the benefits of using human patient simulators as an educational tool to enhance knowledge and skill acquisition, decrease anxiety, and to promote clinical judgment in a safe, controlled environment. | Benner’s Novice to Expert Model | Twenty-one senior level students participating in an acute medical surgical course and two faculty members. | Descriptive study design | A 13-item survey. The survey evaluated the student’s perception of the simulated clinical experience. | Students thought the experience was positive and beneficial. The students reported that they found it difficult to treat the simulator as a real patient, but overall the experience was realistic. The students reported that there were too many students in each group, the scenarios felt disorganized, and too short. The students thought that the scenario promoted critical thinking. The students would recommend the use of human patient simulators. |</p>
<table>
<thead>
<tr>
<th><strong>10. Feingold et al. (2004)</strong></th>
<th><strong>Problem:</strong></th>
<th>Malcolm Knowles Cognitive Learning Theory</th>
<th><strong>Purpose:</strong></th>
<th><strong>Descriptive Study Design</strong></th>
<th><strong>In undergraduate programs.</strong></th>
</tr>
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<tr>
<td>There has been an increase in the use of HPS in nursing education.</td>
<td>To evaluate students’ and faculty members’ perceptions regarding the use of HPS.</td>
<td>The first sample consisted of 50 nursing students enrolled in the advanced acute care of the adult course during the fall semester. The second sample consisted of 47 nursing students enrolled in the same course during the consecutive spring semester. There were four faculty members that took part in the study; they participated in both the fall and spring courses.</td>
<td>A survey tool that consisted of 20 items that were formatted in a 4 point likert-type scale. The items on the survey evaluated the value of the experience, transferability of the skills, realism of the simulation, and value of the learning experience. The four faculty members were given a 17-item survey using a 4 point likert-type format to evaluate experience in relation to faculty support, training, and perceived educational experience.</td>
<td>Of the students 50% thought the skills learned could be transferred to real-life situations. Of the students 73% of thought the pace and flow was real. The vast majority of the students (92.3%) thought that the experience was valuable. Of the students 100% thought that the decision making was valuable, and 100% thought skills learned were valuable. The results of the faculty survey indicated that 100% of faculty</td>
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thought the experience prepared students to transfer knowledge to the real-life setting. All the faculty (100%) thought the scenario was realistic, and 100% thought the HPS was an effective teaching tool. Most faculty (75%) thought that using the HPS would require extra preparation time for clinical, and most 75% responded that there was inadequate faculty support for using the simulation technology which resulted in less
|   | Problem: Further investigation is needed to evaluate the impact of using human patient simulators along with the advanced trauma life support class (ATLS) on the trauma management skills and self-confidence levels in surgical interns. | No identified theoretical/conceptual framework | 12 surgical interns | Descriptive Correlational Study Design | Prior to the start of the course the interns all completed a self-confidence survey that reflected the interns’ self-confidence related to specific trauma management skills. The survey contained 20 items that were answered using a likert scale (1 no confidence to 10 full confidence). After the course and two simulation sessions were completed, the interns completed the same confidence survey. Along with the confidence survey they also completed a 15 item survey with likert scale questions (1-most negative to 10 most positive) that addressed perceived relevance of trauma, effectiveness of critical treatment decision score rose 24% after the course, performance related to potential for adverse outcomes rose 25%, and the interns team behavior score rose 47%. The intern’s mean confidence level rose from 5.8 +/- 0.9 prior to the course to 8.1 +/- 0.5 after the completion of the course. The entire evaluation of the human patient simulator was 8.3 out of 10. The qualitative feedback |
| Problem: | Shortening of resident work hours and the need to provide patient safety in the medical field has caused changes in surgical education. **Purpose:** evaluate the use of simulation in a scenario-based curriculum used to educate | No identified theoretical/conceptual framework | 18 midlevel surgical residents. | Descriptive Correlational Study design | After the residents completed the education, all 18 participants completed a survey that evaluated only the content presented in the sessions. The survey contained likert-type questions (1-strongly disagree to 5 strongly agree). The simulation participants also completed an additional evaluation tool that contained 3 items evaluating the simulation. All items were answered using the Likert scale. The average score for the realism of the simulation was 4, practicing skills 3, and value of debriefing was 5. The overall assessment scores reflected that most residents in both groups received an overall adequate score (simulation group: 59% +/- 6%, the didactic group 66% +/- |
surgical interns.

| surgical interns. | surgical interns. | surgical interns. | same likert-scale format. The last part of the program evaluation took place in the emergency room. A total of 10 participants, 6 who were part of the simulation group and 6 who were part of the didactic group, were videotaped during actual code situations. Each participant had a total of four codes videotaped. There were 16 videotaped codes for the didactic group and 24 videotaped codes for the simulation groups. All twenty-four of the videotaped codes were reviewed and scored by two trained professionals using an objective tool that evaluated numerous aspects of the code. 5%). The simulation group received fewer poor/failed scores (simulation 25% +/- 0%, the didactic group 29% +/- 13%). The simulation group also received more excellent scores (simulation 17% +/- 6%, the didactic group 6% +/- 8%). Results indicated that the simulation participants scored consistently higher throughout all of the areas of actual clinical experience: teamwork, decision making,
and situation awareness.
Introduction

Nurse educators are challenged to provide novice nursing students with a challenging, safe learning environment. With increasing student enrollment and the decreasing availability of clinical sites, there has been an increase in the use of human patient simulators. According to Malcolm Knowles (1980), adult learners are problem-centered and acquire more knowledge when learning experiences are based on real life situations. Human patient simulators provide the opportunity to immediately apply the knowledge.

The purpose of this study is to determine if clinical simulations including assessments, decision making, communication, and psychomotor skills predict clinical competence for nursing students. This study is a partial replication of Feingold et al.’s (2004) study. This study will provide further insight into the use and effectiveness of using human patient simulators in nursing education.

Research Questions

1. What are students' and faculty members' perceptions of patient and scenario realism?
2. Can students transfer knowledge from the simulated clinical scenario to real clinical experiences?

3. What is the value of the learning experience?

Population, Sample, and Setting

The population for this study includes baccalaureate nursing students and faculty at Purdue University. The convenience sample will consist of two groups of 50 baccalaureate nursing students at Purdue University and two groups of two Purdue University nursing instructors during two consecutive semesters of a single academic year.

Protection of Human Subjects

Participation in the study is voluntary. Permission to conduct this study will be obtained from Purdue University and Ball State University Institutional Review Boards. The student and faculty participants will sign a voluntary agreement to participate in the study. Confidentiality will be maintained during the study. There are no identified risks in this study. The benefits of this study include: further insight into the use of human patient simulators, student insight into the use of human patient simulators, further support of using human patient simulators in nursing education, and to support the use of providing safe, effective teaching strategies to novice nursing students.

Procedures

Phases: (a) Faculty training: During this phase the faculty will be trained on how to use the human patient simulator, (b) Scenario formulation: During this phase
the faculty will devise two patient scenarios that will be used to assess the students during the study, (c) Survey completion: During this phase the students will complete a survey that records the student’s demographic data, (d) Student orientation: During this phase the students will be oriented to the simulator guided by the two faculty members. (e) Student Practice: During this phase the student will experience one patient simulator scenario guided by the two faculty members, (f) Final scenario: During this phase the student will be at the end of the semester and experience the 2nd and final patient simulated scenario guided by the two faculty members, and (g) Evaluation: During this phase the students will complete a 20 item survey that contains questions that are formatted using a 4-point likert scale (4-strongly agree to 1-strongly disagree). The questions will address the following areas: realism, transfer, value, and general experience questions. The faculty members will complete a 17-item survey using the same likert scale format. The questions will address faculty support, training, value, transferability, and realism. The phases will be repeated in the exact order during the second consecutive semester.

Research Design

This study is a replication of Feingold et al.’s (2004) study. A descriptive study design will be used to solicit more information related to the use of human patient simulators. In this study feedback obtained, after the surveys are completed and percentages are calculated on each item, will give further insight into the use of human patient simulators in nursing education.

Validity and Reliability
Chi-square tests will be run on the responses gathered from the demographic data survey completed by the students. Chi-square test will be used to identify significant differences in age, gender, and ethnicity. The test will be run to compare the students within each semester then to compare the students semester to semester for differences.

The final survey results will be calculated using the following descriptive statistics: mean, standard deviation, and frequency. Two-tailed T-tests will be run to assess if statistical significance exists between the student’s GPA and survey results. Anova tests with an will be completed to assess if a significance is present between the student’s age and survey responses. The level of significance will be set at 0.05.

Summary

The purpose of this study to gain further insight into student and faculty perceptions of using human patient simulators in nursing education. Knowles’ Theory of Andragogy is used as theoretical framework for this study. Knowles theory provides adult learning principles that support the use of human patient simulators in nursing education. Findings from this study will help educators better understand the value and benefits of using human patient simulators in nursing education. The results will also assist nursing educators in providing the most advanced teaching method available which will provide the healthcare field with better, more prepared, competent novice nurses.
References


