A Simulated Reality for Patient Care: An Alternative to the Social Distancing Barriers of COVID-19

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Abstract

At present, the conditions brought about by the COVID-19 pandemic affect the consistency, quality, and amount of exposure pre-licensing nursing students have to hands-on clinical experiences. Hospitals and other health care organizations are limiting or prohibiting student nurse clinical participation within their environments to comply with communicable disease policies and protect student and patient health. This contributes to an atmosphere in which entry-level nursing students may come into the workforce lacking a sound experiential base obtained in a clinical setting due to social distancing and other pandemic restrictions. Due to decreasing hands-on clinical experiences, it is important to fashion a new environment for nursing students to practice skills. Simulated Hospital Day (SHD) activities in a laboratory setting can contribute to meeting this need. A study was done to evaluate the effect of a SHD on the awareness and competency of pre-licensing nursing students regarding specific nursing interventions and critical thinking performed throughout the SHD. Findings showed a substantial rise in both core awareness and perceived skill competency. It is proposed that these findings may extend to SHD activities modified in response to COVID-19 guidelines. Innovative teaching strategies driven by such modifications may prove useful across educational disciplines for creating environments that promote student achievement of learning outcomes during a global pandemic.

Keywords: Undergraduate Curriculum, Nursing academia, Simulation, Patient Care, Healthcare Providers

Introduction

It takes time and practice to learn concepts within a new field of study and show competence. In certain situations, prior to the end of a single course or program, exposure to all facets of a field of study is unlikely. The body of information needed for nursing students to assimilate before their licensure exam is overwhelming. Students are often required to adapt what they have

learned in a classroom to a clinical environment. Often in the clinical environment, the opportunity to exercise concepts learned in didactic is not readily accessible, or the amount of clinical space for hands-on skills learning is severely limited. Simulation creates a bridge between didactic and clinical encounters while ensuring a healthy learning atmosphere for the student—creating an environment that closely parallels reality (Olaussen, Heggdal, & Tvedt, 2019).

As an innovative teaching/learning strategy, Simulated Hospital Day (SHD) has the ability to have a significant effect on undergraduate nursing education. The simulation activity may also be adapted to particular activities that educators want their students to attend, in addition to offering an alternate hospital experience. Outside academia, hospital education departments may use the SHD to (a) assess new nurse graduates, (b) facilitate continued education for seasoned nurses, and (c) teach new protocols.

History of Simulation:

Simulation is a pedagogy that integrates different styles/equipment of educational learning to transfer the knowledge of a student from beginner to expert (INACSL Board of Directors, 2011). In various professions, simulation has been around for years. One example includes flight simulators that have been developed in aviation to enable pilots to experience various scenarios and become familiar with the controls of the aircraft before flying a real plane (Stamper, Jones, & Thompson, 2008).

In medicine, simulation enables participants during clinical rotations to perform procedures, when real patients are not available. Simulation has been available in nursing for many years; however, the form has evolved over time. Throughout nursing history, simulation has continued to develop, beginning with the use of oranges to practice injections (Sanford, 2010) to the first high-fidelity simulator (SimOne) used for anesthesiology in 1969 (Nehring, 2008), to SimMan 30 (Laerdal, 2012).

Simulation in Nursing Education:

In supplying the nursing student with sufficient immersive learning possibilities, several outside powers operate against the completion. Within the hospital environment, the availability of hands-on training can be limited. In addition to the faculty shortage and lack of appropriate clinical sites, the drive to increase graduation numbers of entry-level nurse graduates (Nehring, 2008) has led to the urgent need to pursue alternative learning opportunities.

The use of simulation is one alternative learning experience. Simulation offers an avenue that enables students to exercise key skill sets in a hospital setting that closely resembles the world. Simulation will introduce students to scenarios that are unique to their field through a versatile learning

setting and teach lessons that will help achieve positive patient outcomes.

Students are better able to maintain information after using simulation, and to associate ideas with experience (Curtis et.al, 2016). They are also more equipped for real-life experiences inside a clinical patient care environment as compared to conventional classroom skills laboratories (Bruce, Levett-Jones, Courtney-Pratt, 2019). In addition, simulation helps a member of the faculty to educate a greater number of students when conducting major nursing interventions.

Although the ideal method of combining information with practice is a real patient environment, there are two key limitations that could build barriers to learning. Increased acuity of patient situations and concerns with patient safety do not allow students to practice enough times in order to obtain experience in the action (Curtis et al, 2016).

There are a wide variety of possibilities for simulation learning that are able to instill theory into practical life and assist the student in implementing the concepts learned in the classroom (Ramm, Thomason, & Jackson, 2015). Knowing that simulation can help the student apply previously learned information to the clinical context and narrow the distance between "know" and do" (Cant & Cooper, 2017), each nursing program has to customize its simulation activity to better suit its needs while adhering to guidelines for best practice.

Advantages of Simulation:

The potential for simulation exercises to give nursing students exposure to patient conditions that may or may not be present in the hospital setting is one of the most advantageous aspects of simulation. These circumstances can be as easy as basic communication, to complicated, vital nursing care about patient teaching (Olaussen, Heggdal, & Tvedt, 2019). Some additional simulation benefits include skill enhancement and the elimination of nursing care errors by routine practice (Hustad, Johannesen, Fossum, & Hovland, 2019).

It is necessary to use active learning in the nursing profession, both in training and in assessing the competency of nursing interventions (Sportsman et al., 2009). A novel, supplementary approach to teaching and testing is high-fidelity simulation (Zapko et al, 2018). By improving self-confidence and competence in clinical nursing treatments, it will benefit the client. It also requires repetitive training/practice to learn skills that a pupil has trouble with and prepares students for their first clinical encounter (Zapko et al, 2018); however a problem with the outcomes is that there has been insufficient psychometric information in the researcher-developed instruments. Regardless of the type of simulation, the exercise must be carefully planned by nursing educators to ensure validation of all components (Smith & Roehrs,

2009).

Simulated Hospital Day:

Simulated Hospital Day (SHD) is an activity that places the participant into a simulated hospital environment with the clinical instructor (Image 1). The simulation room contains five patient beds (complete with functioning headwall systems), bedside tables and cabinets, a supply closet, a sink, audio-visual equipment, and table and chairs arranged to resemble a nurse's station. If the patient profile requires additional equipment (IV pumps, ventilators, Kangaroo pumps, etc.), they are placed at the bedside.

This activity was developed with four main aims in mind. The first aim is the opportunity to conduct patient care procedures with a scripted student-patient in a healthy, real-time learning environment. The student nurse conducts nursing procedures in real time, as he/she does in an actual clinical setting.

The second aim is to observe how students respond to urgent circumstances that involve critical thought, prioritizing, and implementing strategies in patient care. The patient has a sentinel event during the four-hour SHD, which helps the student nurse identify an issue, evaluate the situation, and react appropriately.

The third aim addresses the placement of the activity within nursing courses. Prior to the students' clinical experiences for each course, the SHD is strategically scheduled. This opportunity enables clinical faculty to assess the expertise, performance, therapeutic communication, and professional conduct of their students before entering the hospital setting. It also introduces students to an environment that is conceptually close to the real setting prior to their rotations in the hospital.

The fourth aim of the SHD provides opportunities for inter-professional collaboration with other professional groups: Physical Therapy, Occupational Therapy, Pharmacy, Social Work, Clinical Lab, Speech Language Pathology, and Nurse Practitioner students. Each of these disciplines interacts with the scripted student-patient and the nurse to develop a care plan that addresses (a) the patient's cultural beliefs/practices, (b) health disparities, (c) polypharmacy concerns, (d) death/dying, (e) legal/ethical issues, and (f) mind/body/spirit perspectives.

Invitations to participate in the SHD are also extended to area physicians, hospitals, and technical colleges. Participating physicians' round and request an update on their patients from the student nurse. Registered nurses from area hospitals engage in the roles of nurse managers, infection control nurses, nursing supervisors, etc. Students from technical colleges practice their respective roles and communicate their findings with the student nurse. This partnership helps to improve the competence of nursing students

to work together as a team.

Simulated Hospital Day Agenda:

The timeline for the simulation actually started the night before the SHD operation, when the patient charts were accessed by all students. This allowed students to review and plan for their simulation activity on various aspects of the chart (laboratory observations, patient histories, and admission orders). Prep work was unique to their clinical faculty and included sheets, concept charts, and nursing care plans for medication analysis.

Students began the day by listening to the morning report. Student nurses welcomed their patients after getting the morning report. The simulated day lasted four hours and it was expected that student nurses would complete all of their patients' basic treatment. Basic treatment included: (a) an initial examination, (b) administration of medicine, (c) oral/hygiene care, and (d) any other care required. Patients were transferred out of the unit for diagnostic tests during the four-hour session, which forced the student nurses to modify their care plans. Sentinel events (i.e., hypoglycemia, acute respiratory distress) could also occur, creating an environment where the students needed to think objectively and intervene properly.

The scripted student-patient was given cues on how to perform certain actions, such as language difficulties and modified range of motion. To add to the realism of the virtual environment, equipment (i.e., simulated wounds, saline locks, and drains) was attached to the patient. A detailed script which changed every 30 minutes was given to all patients. This comprehensive script concerned patient actions and maintained consistency through the numerous rooms by its use. The scripts included (a) important assessment information, (b) detailed questions to ask the nurse, and (c) actions that needed to be played out throughout the day. In addition, a list of nurse action questions was given to patients, which they answered based on the actions of their nurse. These questions were sent electronically, and the answers were available to be used for debriefing by the clinical faculty. A nursing student was the scripted student-patient, able to peer review the behavior of their nurse during the "four-hour shift." The peer assessment therefore provides the nurse with direct peer-to-peer input. The cues allowed the scripted student-patient to know what was occurring, and the tasks that should be completed, while providing an opportunity to learn through observation.

The NLN Jeffries Simulation Theory:

There was one nursing simulation theory at the time of this research

that encompassed all the key elements of a simulation operation. This theory was the NLN Jeffries Simulation Theory (Jeffries et. al., 2015). Based on the NLN Jeffries Simulation Framework (Jeffries, 2005, 2007, 2012; Jeffries & Rodgers, 2012), this theory was used primarily to help direct the creation and subsequent evaluation of simulation activities used in nursing school academia (Jeffries et al, 2015). This theory was originally developed using the following three learning theories:

1. Learner-centered theory,
2. Constructivist (cognitive and social) theory, and
3. Socio-cultural perspectives on collaborative technology.

The simulation theory explored virtual nursing education design, implementation, and assessment (Jeffries, 2015). Successful simulation-type teaching and learning practices focused on the experiences of both the faculty and the student with the ultimate aim of developing a well-rounded, active learning approach for students. The learning results were based on aspects of the theory of nursing simulation. For instance, during the simulation exercise, faculty and student roles were just as important as the goals and the environment's fidelity. Depending on whether the simulation activity had a learning or assessment emphasis, faculty roles differed. For the most part, student responsibilities were self-directed. Failure in any of these two positions could result in adverse effects (Jeffries, 2015).

Innovation:

Nursing programs are charged with developing creative teaching modalities, with a growing demand for qualified graduates and a lack of clinical opportunities during nursing school. In order to supplement hands-on hospital experience, several initiatives are turning to simulation by enabling three separate learning modalities: interaction, observation, and debriefing (Hustad, Johannesen, Fossum, & Hovland, 2019).

The number of students who participated simultaneously during a SHD could range from 100 in the fundamental course to 70 in the capstone course. The activity was usually scheduled on two consecutive days for each participating clinical course. All activities during the SHD occurred in real time. There was no verbalization by a student stating how he/she would complete a procedure within a specified time. The student was expected to:

1. Explain the procedure to the patient;
2. Collect the necessary supplies, equipment, and trainers; and
3. Perform the procedure as their clinical instructor provided guidance.

The SHD was a four-hour project (not including debriefing) that had a plethora of teaching opportunities covering a range of topics, unlike many

scenario-driven simulation activities that could be done in 30 minutes or less. The students themselves offered spontaneous teaching opportunities in addition to the scheduled teaching moments, as they thought about exercises and conducted interventions. Although several nursing programs looked at mannequin-based simulation, there were many advantages of using learners as patients on such a wide scale:

1. It was economical.
2. This permitted spontaneous changes in the operation.
3. Human contact was provided.
4. It helped students to understand the constraints faced by patients while hospitalized.

The bonus for the scripted student-patient was the learning that occurred while observing everything transpiring within the room and at their own bedside. Another unique characteristic of the SHD was the way collaboration with other disciplines and members of the community occurred. Not only did students from the College of Health Sciences (CHS) participate in SHD, but they come in large numbers. It was not unusual to have 20 students from PT, OT, or Clinical Lab participate in a SHD or to have more than one discipline at a time. Collaboration was not limited to CHS students but was extended to students from other academic institutions and health care members within the El Paso community.

Methodology:

The design of the study was a comparative descriptive design comparing the pre-test and post-test scores of students on core knowledge and perceived skill competency. This design identified patterns/trends related to the behavior of simulation and created hypotheses on which further study could be focused. This project looked at the core baseline knowledge/perceived skill competence of each student and compared it to core knowledge/perceived skill competence after simulation. In the study, all participants completed a pre-SHD evaluation and then participated in the SHD activity. Immediately following the SHD activity, the participants completed a post-SHD evaluation. In this design, the participants were their own controls.

Research Questions:

This research study was guided by the following research questions:

R_1: Pre-licensure nursing students will have higher self-assessed competency scores of specific nursing interventions after participating in SHD.

R_2: Pre-licensure nursing students' knowledge of selected patient care concepts will increase after participating in SHD.

R_3: Self-assessed competence and knowledge of selected patient core

concepts/interventions will differ, depending on whether the student was in the nurse role day 1 or day 2 during the SHD activity.

Setting:

Previous to the simulation exercise, all students received the same didactic content. The setting of the study was the Center for Simulation located at the School of Nursing. The simulation labs were configured to closely replicate a hospital environment, including patient charts and equipment (i.e., intravenous pumps, oxygen regulators, and suction kits). The role of the scripted student patients was played by nursing students. Using real-patient data/trends, patient charts were created. Medication charts followed the same format as the hospital arena. The atmosphere of the hospital resembled the traditional surgical medical floor. All participating nursing students were given a brief description of the hospital equipment prior to the simulation exercise to ensure they were familiar with the mechanics.

Sample:

The sampling method was convenience sampling. The participants who consented to the study completed the pre-SHD Survey/Core Knowledge Quiz, the SHD activity, and the post-SHD survey/Core Knowledge Quiz. After finishing the pre-SHD criteria, the participants were allocated their places for the SHD.

First-semester nursing students from the UTEP BSN program were the participants. In order to provide a baseline look at nursing students and their ability to process basic nursing tasks during a SHD, this unique group of students was selected for the research. This unique group of students had certain characteristics for this study that made them ideal. Those characteristics include:

1. Completion of a course in health assessment;
2. Testing on basic nursing abilities is completed; and
3. Not having started clinical rotations in a hospital setting.

To assess the suitable number of participants, a power analysis was performed. In this specific simulation operation, minimal published research offered guidance to determine the sample size needed; thus the following was used to determine the number of participants. The desired power was 0.80, the effect size was 0.50 (moderate), and the significance level was 0.05 using a paired sample t test. Those factors put the minimum number of participants at 64 per category. The total minimum number of participants was 64 since the participants acted as their own controls (making this a within subjects design).

Inclusion/Exclusion Criteria:

Inclusion criteria included first-semester nursing students from a

traditional BSN program. Previous experience as a vocational nurse, nursing student, or other healthcare professional was included within the demographic information however such experience did not preclude student nurses from participating. Exclusion criteria included student nurses who were not currently in the first semester of the BSN program. Other exclusion criteria included students who were taking the first-semester course for the second time due to a previous course drop or failure, and any student under the age of 18.

Instrumentation:

The tools used for this study were the Participant Demographics Survey, Simulated Hospital Self-Assessment (Student as a Nurse) Survey, and the Core Knowledge Quiz. The Participant Demographics Survey was a list of questions that determined the population's characteristics (i.e., age, gender, primary language, and level of experience). The Simulated Hospital Self-Assessment (Student as a Nurse) Survey was created by the Primary Investigator at the School of Nursing. This survey asked participants to respond to their perceived competence in specific nursing skill sets (self-assessment) skills. 10 questions encompassed the skill sets:

1. gathering data from the patient assessment;
2. modifying a plan of care;
3. utilizing therapeutic communication;
4. administering medications;
5. prioritizing interventions;
6. intervening when a patient's condition changes;
7. documenting pertinent information;
8. managing time;
9. interacting with healthcare providers; and
10. promoting patient safety.

The students rated their perceived level of skill using a five-point Likert scale (I = strongly disagree, 2 = disagree, 3 = somewhat agree, 4 = agree, and 5 = strongly agree). This survey was used as both a pre- and post-survey. All questions were cross-referenced with the Texas BON direct competencies and with the Core Knowledge Quiz categories. The third tool was the Core Knowledge Quiz, consisting of multiple-choice nursing action questions related to activities the student nurse completed during the SHD. Content validity of the core knowledge questions was completed prior to the onset of the study.

Preliminary Work (Student as a Nurse Survey):

Instrument content validity was established for this newly developed

nine- item instrument, Simulated Hospital Self-Assessment (Student as a Nurse) Survey. These items were nursing actions related to the BON Direct Competencies. Seven experts in simulation were asked to score each item for content relevance. A Content Validity Index (CVI) was calculated for each item and for the total scale.

The CVI for the items resulted in item Q3 (CVI = 71.4%) and Q9 (CVI =85.7%) needing revision. The total scale CVI was 95.24%. The two items were reworded, based on the results of the CVI. It was also noted that there were no items directed towards safety for the patient. As this is a major component of nursing, an additional nursing action item was added regarding the nurse ensuring patient safety. A second instrument content validity was conducted using this revised 10-item instrument. Eleven experts in simulation were asked to score each item for content relevance. A CVI was calculated for each item of the survey and for the total scale. For the Simulated Hospital Self-Assessment (Student as a Nurse) Survey, the CVI for items 1-5 and 7-10 was at 100%. The CVI for items 2 and 6 was at 90.9%. The CVI for the total scale was 97.27%.

As a measure of internal consistency reliability, Cronbach's alpha was performed and resulted in an alpha of 0.96 for the total scale. This indicated a high internal consistency. To test for stability, a split-half coefficient test was run. This test was chosen since it negates the potential biases that can occur with a test-retest approach. The items on the survey were divided in two, with items 1-5 indicated as 5a and items 6-10 indicated as 5p. The results indicated a high internal consistency for both groups 5a and 5p (alpha= 0.891, alpha= 0.934, respectively). In addition, the correlation between forms was 0.910.

Preliminary Work (Core Knowledge Quiz)

Instrument content validity was established for the newly developed 20-item knowledge instrument Core Knowledge Quiz. This quiz used categorical data to measure different types of concepts/skills. These items were basic core nursing actions related to the BON Direct Competencies and to the Simulation Hospital Self- Assessment (Student as a Nurse) Survey. Six simulation experts were asked to rate each item for content relevancy. A CVI was calculated for each item and for the total scale. For the Core Knowledge Quiz, the CVI for all items was at 100%. The CVI for the total scale was 100%.

Data Analysis:

Data analysis included descriptive demographic information statistics, which included a general population overview and a comparison of mean core knowledge and perceived competency scores from pre-test to post-test, using a design within the subjects. Specifically, the analysis was as follows:

- Hypothesis 1: "Pre-licensure nursing students will have higher self-

assessed competency scores of specific nursing interventions after participating in SHD." To test this hypothesis, mean scores on the Simulated Hospital Self-Assessment (Student as a Nurse) Survey self-competency subscale (items 1-10) were compared between pre- and post-test using a within subjects paired samples t test. It was hypothesized that these students would score higher after participating in SHD.

- Hypothesis 2: "Pre-licensure nursing students' knowledge of selected patient care concepts will increase after participating in SHD." To test this hypothesis, mean scores on the Core Knowledge Quiz subscale (items 1-20) were compared between pre- and post-test using a within subjects paired samples t test. It was hypothesized that these students would score higher on the items after participating in SHD.
- Hypothesis 3: "Self-assessed competence and knowledge of selected patient core concepts/interventions will differ, depending on whether the student was in the nurse role day 1 or day 2 during the SHD activity." To test this hypothesis, mean scores on both the Simulated Hospital Self-Assessment (Student as a Nurse) Survey and the Core Knowledge Quiz were compared between day 1 and day 2, using a between subjects independent samples t test. It was hypothesized that there would not be any difference between self-assessed competence and core knowledge between day 1 and day 2.

Results:

Participant Demographics

In the pre-licensure baccalaureate nursing program, a total of 75 participants were enrolled. Both the pre- and post-evaluation instruments were completed by all students who participated in the research. In order to determine the demographics of the participants completing the SHD exercise, questions were asked. This population's demographics is diverse in age, prior experience in healthcare, and race/ethnicity.

The majority of participants (87 percent) were female. Ages ranged from under 20 years of age to over 51 years of age, with distinct degrees of experience in health care. The highest percentage (52 percent) of participants reported having less than one year of healthcare experience. More than half of the students (77 percent) did not have a previous college degree. Half of the participants spoke their primary language at home in English (51 percent), and one-third of the participants spoke their primary language in Spanish (33 percent). The predominant race and ethnicity listed was Spanish/Hispanic/Latino(a) at 85.3 percent. (See Table 1)

Perceived Skill Competence (Hypothesis 1)

The hypothesis notes that after engaging in SHD, pre-licensing nursing students would have higher self-evaluated skill competency scores for particular nursing interventions. Before the SHD activity and immediately after the end of day 2 activity, all students completed the SHD "Student as a Nurse" Survey. The survey instrument was a compilation of 10 items that asked questions about the perceived level of competence of the nursing student with core nursing behavior.

The survey responses ranged from 1-5, with "1" representing "Strongly Disagree" and "5" representing "Strongly Agree." A paired sample/-test was performed to compare the self-assessed skill competency scores of pre-licensure nursing students prior to and after the SHD exercise was completed. This test was selected because the nursing students acted as their own controls (n = 75) before and after completing the SHD operation, responding to survey objects. Participants had significantly higher perceived skill competence scores after attending the SHD activity (M = 4.18, SD = 0.69) then before participation (M = 4.45, SD= 0.55), t (74) = 3.48, p = 0.001.

Core Knowledge (Hypothesis 2)

The hypothesis notes that after engaging in SHD, the awareness of selected patient care principles by pre-licensure nursing students would increase. Prior to the SHD activity and immediately after, both students completed the Core Knowledge quiz. 20 multiple choice questions representing the key nursing interventions covered in the SHD were included in this awareness quiz. There were four responses to the multiple-choice questions: one answer was correct and the other three answers were incorrect. A paired sample t test was performed to compare the core awareness of nursing interventions before and after the SHD task was completed by pre-licensing nursing student.

This test was chosen because the nursing students acted as their own monitors (n = 75) as they replied both before and after completing the SHD activity to the multiple-choice quiz questions. If there was a substantial difference in mean scores comparing the post-test scores to the pre-test scores would be calculated by this test. Participants had significantly higher core patient care concepts knowledge scores after attending the SHD activity (M = 65.40, SD= 13.7) then before participating (M = 69.20, SD= 13.1), t (74) = 2.51, p = 0.014.

Day 1 Nurses vs. Day 2 Nurses (Hypothesis 3)

The final hypothesis assessed whether there was a difference with respect to their placement as a nurse on day 1 or day 2 of the SHD operation in either core expertise (pre/post) or perceived ability competence (pre/post).

The nurse assignment variable was evaluated for this study query. For one day each, each nursing student worked as a nurse" and a "scripted student-patient" Students of nursing were allocated to be nurses for day 1 and patients for day 2 vs. patients for day 1 and nurses for day 2 (n=75). The investigator examined whether the location of the position made a difference in the results of learning. An independent t-test study was performed to assess the nurse's assignment (day 1 vs. day 2) in relation to core experience and perceived abilities prior to and after completion of simulated hospital experience.

In relation to their placement in the nursing role (day 1 vs. day 2), this test was chosen to assess if there was a substantial difference between the core knowledge of the nursing student and perceived skill level. This test compared the means of each sample—pre/post core information quiz and scores of pre/post survey—and calculated if the results were statistically relevant. Results of the Levine test showed that there was no breach of the homogeneity of the statement of variances.

There was not a significant difference in the pre-scores for core knowledge for day 1 nurses (M = 65.57, SD= 13.97) and day 2 nurses (M = 65.25, SD= 13.68); t (73) = 0.10, p = 0.92. There was not a significant difference in the post-scores for core knowledge for day 1 nurses (M = 70.14, SD = 11.34) and day 2 nurses (M = 68.38, SD= 14.56); t (73) = 0.580, p = 0.563. These findings embrace the null hypothesis and indicate that the nurse's placement (day 1 vs. day 2) does not have an effect on the acquisition of the substance of core information.

There was not a significant difference in the pre-scores for perceived skill competency for day 1 nurses (M = 4.09, SD= 0.77) and day 2 nurses (M = 4.26, SD= 0.61); t (73) = -1.05, p = 0.30. There was not a significant difference in the post-scores for perceived skill competency for day 1 nurses (M = 4.41, SD= 0.55) and day 2 nurses (M = 4.48, SD= 0.55); t (73) = -0.58, p = 0.56. These findings accept the null hypothesis and show that the nurse's placement (day 1 vs. day 2) does not have an effect on the acquisition of perceived skills.

Discussion:

The first research question asks if the SHD operation had any effect on the self-assessed skill competency of particular nursing interventions of the nursing student. This research question raised the concern that, due to the limited availability of particular patient conditions, clinical rotations do not offer students the opportunity to "practice" their skills (Hustad, Johannesen, Fossum, & Hovland, 2019). Study findings showed that after completing the SHD operation, there is an improvement in perceived skill competency. Educators have the ability to encourage nursing students to understand and learn nursing principles that are important for practice by

providing an atmosphere that mimics the hospital experience.

The second hypothesis addressed the problem of whether the nursing student's comprehension of selected core principles of patient care increased after engaging in SHD. Literature demonstrates that simulation has the potential to help and promote the learning process with didactic content (Ramm, Thomason, & Jackson, 2015). Results from this research have shown that after participating in the SHD operation, there is an improvement in core awareness. This could translate into other entities using this form of simulation environment to promote continued education or other levels of nursing education (such as hospital training and development departments and other nursing programs).

The final research question asked whether the timing of the nurse's position made a difference in the core knowledge or perceived competence of the nursing student. The findings of this study showed that, depending on whether the student was the nurse on day 1 or day 2, there was little difference in learning outcomes. In particular, the findings indicated that nursing students have an improvement in core competence and perceived skill capacity as long as both the nurse and the scripted student-patient play a role during the SHD operation.

Results Compared with NLN Jeffries Simulation Theory

The findings were consistent with the results seen in the Simulation System for Nursing Education (Jeffries, 2015). In designing the SHD activity, a hands-on learning experience was developed using the system constructs. The learning outcomes of core knowledge and perceived skills were based on the other key components of the SHD activity: instructor (facilitator), student (participant), used instructional activities (hands-on interaction), and design of simulation (realistic medical surgical hospital unit).

Strengths of the Study

Scripted events that occurred during the SHD were controlled variables. In each of the simulated spaces, unregulated variables were the numerous clinical faculty members who were the lead facilitators. To limit the discrepancies between the clinical classes, all clinical faculty members were given an in-service briefing prior to the SHD. Topics provided critical material during the in-service, such as patient profiles, scheduled activities, and tips for handling five patients in each room.

Furthermore a "playbook" was supplied to all clinical faculty members. This playbook consisted of patient scripts and the timeline of acts during the SHD operation. Along with this knowledge, the rationales of behavior and the course of the day of the patient were given to the clinical

faculty members to better understand what happened during the operation of SHD.

Clinical faculty members were given an overview of relevant subjects to discuss what happened during the SHD activity in order to structure the debriefing session after the SHD activity. The strength of the research was the opportunity to assess whether the SHD had a beneficial influence on the experience and nursing skills of the students. Since this was the first known study to investigate SHD's efficacy, the findings provided a framework on which future research could be focused.

Limitations of the Study

As an aspect of their clinical requirements, all students were expected to complete the activity. While it was optional to engage in the data collection portion of the SHD, students could not opt out of the activity itself. During the SHD operation, as each student participated in two roles (one day as a nurse and one day as a patient), the study examined whether there was learning throughout the two-day period. It was not possible to decide if the learning was from day 1, day 2, or a mixture of both days, for this analysis. Evaluating the participants before the SHD activity, after day 1, and after completion of the SHD activity (day 2) will be a possible improvement for future SHD activities.

The use of clinical faculty as facilitators of their clinical groups was another weakness. While structured files containing comprehensive patient scenario details were given to each teacher, it was impossible to monitor how events were prioritized by individual instructors and the direction student interaction would take. A debriefing blueprint that included the key paths of the patient's hospital day and components of the core information was also provided to facilitators. Since the facilitators were given the same written details and were engaged in training prior to the SHD operation, depending on the experience/knowledge of the facilitator and/or the actions/questions of the nursing student, the facilitator may take the activities down a different direction than originally written.

Contribution to Nursing Knowledge

The SHD practice provides an alternate clinical environment for nursing teachers to use important nursing interventions in teaching nursing students. In developing a virtual environment that allows learning both from an observational and hands-on interactive level, this activity has demonstrated its importance. This practice is also one-of-a-kind, composed of components of simulation practices not currently seen in nursing literature. One of these elements is student-patient learning through observation as scripted. Another aspect is the real-time simulation (not simulated time) for a four-hour time

frame in which students conduct all care management tasks for their patients (such as skills, therapeutic communication). This atmosphere also enables facilitators to direct students through the process and provide immediate input on specific actions of the participant. The final unique aspect is the introduction into the SHD of learners from various inter-professional health care provider programs. Both respondents engage with patients, each other and faculty to develop skills in developing inter-professional relationships that should be translated after graduation into their practice.

Recommendation for Actions

The findings of this research study demonstrated the importance of the SHD operation in the first semester of Nursing Care of the Individual Course for entry-level nursing students. The researcher was able to conclude that this simulation practice was useful as an alternative clinical experience for pre-licensing nursing students by revealing a substantial improvement in core skills and perceived skill competency. SHD should be seen as an essential part of the nursing program by nursing educators.

Recommendations for Further Studies

One recommendation for further research will be to assess whether after day 1 and day 2 there is a difference in core knowledge and perceived skill competency. Students (as patients) should be checked at the end of day 1 and at the end of day 2 prior to the initiation of SHD operation. This would allow the researcher, if the student only played the patient role, to monitor for progress in knowledge and competence.

A further research suggestion will be to assess if individual clinical facilitators have made a difference in the knowledge/competence acquired during SHD. Their clinical teacher directed each clinical party. The researcher will be able to determine whether there were any variations depending on the facilitator by evaluating each group against each other.

A third suggestion would be to assess whether a hospital/community environment could be integrated into the SHD operation. The SHD may be used by nurse educators at various facilities to test the abilities of new graduates to combine expertise with hands-on treatment, run high-impact-low exposure scenarios for seasoned nursing workers, and evaluate staff as an aspect of their annual appraisal. This form of operation may then, if useful, be adapted for hospital training and development departments to educate nurse graduates and/or hold annual training sessions for all employees.

Finally, another suggestion will be to establish unique activities which the Joint Commission and other accrediting bodies consider to be relevant and to assess the level of learning at which the participants are noted. This will give nursing students and/or registered nurses another constructive learning

avenue to learn principles and practice interventions associated with the events/conditions.

Conclusion

As nursing educators, the use of active learning to help promote didactic awareness is important. This research concludes that following a SHD, substantive learning occurs. Using a live interactive scripted student-patient, the effectiveness of SHD can be attributed to its specific characteristics, using a four-hour period of time that allows student nurses to coordinate and prioritize various scheduled and unexpected activities that occur throughout the day and to manage and secure a patient chart. Both nursing students and inter-professional collaborators will work through mock scenarios to learn/review critical interventions that will benefit them in the real patient setting by creating a virtual hospital.

References:

1. Bruce, R., Levett-Jones, T., Courtney-Pratt, H. (2019). Transfer of Learning from University-Based Simulation Experiences to Nursing Students' Future Clinical Practice: An Exploratory Study. Clinical Simulation in Nursing. Doi: https://doi.org/10.1016/j.ecns.2019.06.003
2. Cant, R. & Cooper, S. (2017). Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review. Nurse Education Today. Doi: https://doi.org/10.1016/j.nedt.2016.11.015
3. Curtis, E., Ryan, C., Roy, S., Simes, T., Lapkin, S., O'Neill, B, Faithfull-Byrne, A. (2016). Incorporating peer-to-peer facilitation with a mid-level fidelity student led simulation experience for undergraduate nurses. Nurse Education in Practice. Doi: https://doi.org/10.1016/j.nepr.2016.07.003.
4. Hustad, J., Johannesen, B., Fossum, M., & Hovland, O. J. (2019). Nursing students' transfer of learning outcomes from simulation-based training to clinical practice: a focus-group study. *BMC nursing*, *18*, 53. https://doi.org/10.1186/s12912-019-0376-5
5. INACSL Board of Directors. (2011). Standards of best practice: Simulation. Supplement to Clinical Simulation in Nursing, 7(4S), 1-19.
6. Jeffries, P. R. (2005). A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives*, *26*(2), 96-103.
7. Jeffries, P. R. (Ed.). (2007). *Simulation in nursing education: From conceptualization to evaluation.* New York, NY: National League for Nursing.

8. Jeffries, P. R. (Ed.). (2012). *Simulation in nursing education: From conceptualization to evaluation* (2nd ed.). New York, NY: National League for Nursing.
9. Jeffries, P. R., & Rogers, K. J. (2012). Theoretical framework for simulation design. In P. R. Jeffries (Ed.), *Simulation in nursing education: From conceptualization to evaluation* (2nd ed., pp. 25-42). New York: National League for Nursing.
10. Jeffries, P., Rodgers, B., & Adamson, K. (2015). NLN Jeffries Simulation Theory: Brief Narrative Description. Nursing education perspectives, 36 5, 292-3
11. Laerdal Corporation. (2012). NLN Simulation in Nursing Education, Vol. 1, VitalSim Scenarios. http://www.laerdal.com
12. Nehring, W. M. (2008). U.S. Board of Nursing and the use of high-fidelity patient simulators in nursing education. Journal of Professional Nursing, 24(2), 109-117. doi:10.1016/j/profnurs.2007.06.027
13. Olaussen, C., Heggdal, K., & Tvedt, C. R. (2019). Elements in scenario-based simulation associated with nursing students' self-confidence and satisfaction: A cross-sectional study. *Nursing open*, *7*(1), 170–179. https://doi.org/10.1002/nop2.375
14. Ramm, Dianne & Thomson, Anna & Jackson, Andrew. (2015). Learning clinical skills in the simulation suite: The lived experiences of student nurses involved in peer teaching and peer assessment. Nurse Education Today. 35. 10.1016/j.nedt.2015.01.023.
15. Sanford, P. G. (2010). Simulation in nursing education: A review of the research. The Qualitative Report, 15(4), 1006-1011.
16. Smith, S., & Roehrs, C. (2009). High-fidelity simulation: Factors correlated with nursing student satisfaction and self-confidence. Nursing Education Perspectives, 30(2), 74-78
17. Sportsman, S., Bolton, C., Bradshaw, P., Close, D., Lee, M., Townley, N., & Watson, M. (2009). A regional simulation center partnership: Collaboration to improve staff and student competency. The Journal of Continuing Education in Nursing, 40(2), 67-73
18. Stamper, D. H., Jones, R. S., & Thompson, J. C. (2008). Simulation in health care provider education at Brooke Army Medical Center. Military Medicine, 173(6), 583-587.
19. Wholeben, M., Pope, P., & Stout, R. (2012). SHD Visual and Model. University of Texas at El Paso.
20. Zapko, K., Ferranto, M., Blasiman, R., & Shelestak, D. (2018). Evaluating best educational practices, student satisfaction, and self-confidence in simulation: A descriptive study. Nurse Education Today. Doi: https://doi.org/10.1016/j.nedt.2017.09.006

Table 1

Demographic Results of Participants

Categories	Number of Subjects (n)
Gender	
Female	65
Male	10
Age	
<20 yrs	5
21-25 yrs	46
26-30 yrs	10
31-35 yrs	7
36-40 yrs	3
41-45 yrs	2
46-50 yrs	1
>51 yrs	1
Primary Language	
English	39
Spanish	25
Both	16
Race/Ethnicity	
Black/African American	2
Asian/Middle Eastern/Pacific Islander	2
Spanish/Hispanic/Latino (a)	64
White/Caucasian	7
Previous Degree	
Yes	17
No	58
Prior Healthcare Experience	
None	22
<1 yr	39
1-3.9 yrs	8
4-6.9 yrs	3
7-9.9 yrs	2
10-13.9 yrs	0
>14 yrs	1

Image 1