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Simulation in Orientation: Increasing Nurses' Self-Confidence in Hospital Equipment, Policies, and Procedures

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Simulation in Orientation: Increasing Nurses' Self-Confidence in Hospital Equipment, Policies, and Procedures

by

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Abstract

Simulation provides a safe environment for the nurse to practice and learn new skills in a safe and controlled manner. This allows a novice nurse to advance to an expert level without placing a patient at harm and increasing self-confidence at the bedside. The purpose of the Orientation Simulation Study is to evaluate the effectiveness of simulation on self-confidence on new hire nursing staff when learning how to use the hospital Heparin Nomogram and dose mode on the IV pump. The study was conducted over four months with 18 nurses surveyed using a pre- and post-Likert scale called the Confidence Scale. The new hire nurses were hired for the medical-surgical units, which included: Medical, surgical, critical care, intermediate care, oncology, and emergency department. Data showed mean scores of the pre-survey to be 11.11, while post-survey mean scores increased to 17.22. With a paired t-test p-value being less than 0.00 there was a significant difference in self-confidence after simulation. Simulation has been shown to increase self-confidence in other disciplines such as nursing students, military, aviation, medicine, and physical therapy

   Keywords: Simulation, nursing education, experienced nurse

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iv

Table of Contents

List of Tables

List of Figures

CHAPTER I

Introduction

Many challenges exist today in the nursing profession. As the world of healthcare is ever changing and patient demands are at their greatest, it is imperative for nurses to stand confident in their practice to ensure that high quality care is being delivered to a perplexing patient population. One of the greatest challenges for nurses can be the orientation process at a new healthcare facility. Adapting to new facility equipment, policies, and procedures can prove challenging for both the novice and expert nurse. Recent evidence suggested that the use of simulation prepares nurses to manage patients in a safe, confident, and competent manner (Hommes, 2014).

Nursing orientation has been deemed as one of the most stressful times in a nurse's career. With financial constraints and an overall shortage in qualified and experienced staff to serve as preceptors, oftentimes the newly hired nurse will have a shorter orientation period without proper training. With a lack of social support, the new nurse is more likely to develop a sense of powerlessness and decreased levels of confidence within their nursing skills (Ackermann, Kenny, & Walker, 2007).

With the known imperfections facing today's nursing orientation programs, it is pivotal to find new ways to ensure quality nursing education and confidence at the bedside. Radhakrishnan, Balachandran, Venkatesaperumal, and D'Souza (2013) stated, "The aim of simulation in nursing education is to develop an environment that enables the learner to perform naturally to gain insight into the complexity of the actual workplace and enable students to transfer their learning from the simulation laboratory to the clinical setting as they care for human patients" (p.251). This also allows students to

take skills learned within a simulation lab and apply them in the nursing environment. Simulation encourages learning through experimentation with the ability to rewind, redo, and practice without negative patient outcomes.

Significance

The use of simulation to improve nursing practice dates back to 1950. "Mrs. Chase", the first patient simulator, was introduced to teach nursing students how to complete the physical assessment. By 1960, implementation of another simulator, named "Harvey", was used to determine heart and lung sounds. Simulators have been advancing in nursing education steadily ever since. Currently, some states allow up to 25% of their clinical learning to occur within a simulation lab (Radhakrishnan et al., 2013).

Numerous studies have been conducted to indicate an increase in self-confidence with the use of simulation among nursing students, aviation, medicine, physical therapy, and military, however; little research has been conducted on the impact of self-confidence simulation has on the practicing nurse. With hospital nursing staff being composed of 10% novice nurses, and orientation being seen as one of the most stressful times in a nurses' career, it is time to think about adding simulation to the orientation process (Cooper, Prion, & Pauly-ONeill, 2015). The overall nursing workload has increased. Preceptors do not always have time to review various hospital equipment, policies, and procedures prior to use in patient care for the first time. Newly hired nurses may have low self-confidence in orientation due to the lack of experience with the present organization.

A study by Thomas and Mackey (2012) showed clinical simulation experiences significantly improve student's self-confidence. Blum, Borglund, and Parcells (2010)

found an overall increase in self-confidence and competence across a semester. With a relative lack of clinical nurse educators and clinical sites, Kimhi et al. (2016) studied the use of simulation and nursing student's self-confidence. They found that simulation within the first year of nursing courses increased student's self-confidence and self-efficacy for the nursing process. Medicine, aviation, physical therapy, and the military have all utilized simulation in both initial training and continued competence in practice. Duran, Bismuth, and Mitchell (2013) conducted a survey of vascular surgery trainees to reveal trends in operative experience, confidence, and attitudes about simulation. The data showed an overall support for the use of simulation within the standardized curriculum in vascular surgical training. Similarly, a study of 79 first year medical students demonstrated a reported increase in self-confidence within the student's physical assessment skills (Swamy et al., 2014). Physical therapy students also reported increased self-confidence levels in working with critical care patients through the use of simulation (Ohtake, Lazarus, Schillo, & Rosen, 2013). Additionally, both aviation and the military found simulation to be a highly effective strategy for scenario-based education programs (Lucas, 2014).

Purpose

The purpose of this Orientation Simulation Study is to examine if the use of simulation in nursing orientation can significantly increase the nurses' self-confidence in relation to the use of dose mode on the hospital IV pump when implementing the Heparin Nomogram.

Theoretical or Conceptual Framework

The theoretical framework of this study stems from Patricia Benner's work surrounding the novice to expert model. Benner believes that one learns to be a practitioner by engaging in education and socialization into the practice with other practitioners. She describes nursing as a socially organized body of knowledge, with skill sets and styles relating to other practices and with science and technology. Benner studies include clinical nursing practice with an attempt to discover and describe the knowledge embedded within the practice. Benner notes in her work that a practice as complex as nursing requires ongoing clinical knowledge development through experiential learning, necessitating openness, attentiveness, with responsible engaged education (Benner, 2000).

Benner defines this type of work as articulation research which is further defined as describing, illustrating, and giving language to taken for granted areas of practical wisdom, skilled know-how, and also notions of good practice. From her theory on nursing practice, Benner adapted a model that describes five levels of skill acquisition and development: (1) novice, (2) advanced beginner, (3) competent, (4) proficient, and (5) expert. Since this model is not trait-based but situational based, the level of performance is not an individual characteristic of an individual performer, but is a function of a given nurses' familiarity within a particular situation (Alligood, 2014, Chapter 9).

Benner uses the example that a nurse can be the best advanced beginner possible, usually in their first year of nursing practice. Regardless of stage, no practitioner can practice beyond their experience, despite necessary attempts to make the practice as

explicit as possible. With the use of experiential learning leads to individualization and clinical discernment which renders critical pathways in a sensible and safe manner. Also, with experiential learning, nurses are able to develop notions of good practice that are constantly being worked out and extended upon (Benner, 2000).

Thesis Question or Hypothesis

Thesis Question: Does participation in simulation increase the confidence level of newly hired nurses with the use of hospital equipment when administering heparin?

Hypothesis: Participation in simulation will have a positive impact on nurse's confidence when utilizing the heparin protocol and required equipment.

Definition of Terms

High-Fidelity Simulation is also known as human patient simulators. These simulators house software that is retained within the mannequins and can be accessed via a desktop or laptop computer. The mannequin is equipped to showcase a variety of health conditions and outcomes. These simulators allow for insertion of endotracheal tubes, chest tubes, intravenous catheters, and bladder catheters. More advanced simulators are equipped to exhibit trauma victims, pediatric patients, and child birth. The controller of the simulator is able to elicit a clinical scenario using electrocardiogram rhythms, and recent vital signs to give learners a real-life experience (Peteani, 2004).

Self-Confidence is defined best by Webster as confidence in oneself and in one's powers and abilities (Merriam-Webster, 2016). For purposes of this study, "abilities" will be focused on nursing skills and application in the use of equipment, policies, and procedures.

The nursing profession is faced with significant challenges at the bedside, and with the increasing complexity of patients and workloads that pose time constraints on nursing orientation, education away from the bedside must be examined. Simulation has been shown in other areas of medicine, nursing education, and other disciplines to improve students' overall self-confidence. The purpose of this study is to examine the use of simulation in new hire nurses orientation and evaluate for a correlation in self-confidence with the nurse's ability to use hospital equipment and follow hospital policies and procedures.

CHAPTER II

Literature Review

The purpose of the Simulation Orientation Study is to explore if use of simulation within a new hire nursing orientation program increases nurse's self-confidence with regards to implementing the hospital's Heparin Nomogram using dose mode on the hospital IV pump. While simulation has been used in other disciplines and in student nursing education for years, this is a new, progressive way of thinking for the practicing nurse. Research on the use of simulation within hospital orientation periods is limited. With hospitals under financial constraints, and an overall shortage of qualified experienced staff within the acute care setting, an increase in inadequate orientation periods has been seen (Ackermann et al., 2007). The sources used to conduct this literature review include: Cumulative Index for Nursing and Allied Health Literature [CINAHL], PUBMED, Science Direct, Lippincott Williams & Wilkins, and Elsvier. The key words used to conduct this review include: simulation, self-confidence, orientation, and practicing nurses.

Self-confidence and Nursing Students

First, it is pivotal to look at the impact of simulation on self-confidence within the student nurse population, due to little research on simulation on practicing nurses. Kimhi et al. (2016) describes simulation as a risk-free environment where the student can integrate theory and practice without negative patient outcomes. Kimhi et al. (2016) further explained that self-efficacy led to increased self-confidence. The results of this study showed that simulation in the first-year of nursing school increases student's self-confidence/self-efficacy. Also concerning increased self-confidence in nursing students,

Thomas and Mackey (2012) discussed how a patient's change in condition revealed that students are often unprepared. Students with increased self-confidence have a better chance at surpassing clinical goals and have been shown to be more likely to test their clinical skills without fear (Thomas & Mackey, 2012).

Critical Thinking and Nursing Students

Cooper et al. (2015) pointed out that the Institute of Medicine has named education as a bridge leading to quality patient care. It is imperative for nurse educators to prepare nursing students with real-life experiences. It is suggested that didactic courses, clinical rotations, and simulation are the three most common approaches in teaching nursing students how real-life patient care can change quickly. The overall goal in nursing education is to produce competent, safe, qualified nurses (Cooper et al., 2015). Looking at the correlation between student self-confidence and clinical competence, Blum et al. (2010) found that self-confidence and clinical competence was increased over a semester by using both simulation and classroom approaches. It is suggested that simulation serves to reproduce acute clinical settings, however the diversity of real world experiences cannot be fully recreated. (Blum et al., 2010).

Satisfaction and Nursing Students

Smith and Roehrs (2009) examined factors that correlated with nursing student's satisfaction and self-confidence. Results indicated that design characteristics such as clear objective, and realistic patient situations that required problem solving were significantly correlated with student satisfaction and self-confidence (Smith & Roehrs, 2009). Samawi, Miller, and Haras (2014) agreed that the success of simulation increasing self-confidence,

critical thinking, and satisfaction were dependent on the quality of the simulation experience (Samawi et al., 2014).

Simulation and Nursing Faculty

Crocetti (2014) suggested the use of simulation within nursing faculty orientation. In 2010, the National League for Nursing reported that full-time faculty vacancy rates in baccalaureate degree programs reached 32%. Nursing schools throughout the country have adapted to this shortage by hiring part-time adjunct clinical faculty. Crocetti (2014) concluded that the use of simulation in a faculty-centered orientation practice results in greater self-efficacy for the adjunct nursing faculty. Waxman and Telles (2009) confirmed that the Benner model of novice to expert is applicable to training faculty members how to use simulation. They argued that all faculty begin at the novice stage when learning how to teach students with simulation. Faculty may be experts at clinical bedside nursing, but are novices when it comes to acquiring skills on teaching with high-fidelity patient simulators (Waxman & Telles, 2009).

Simulation and New Graduate Nurses

Simulation is often used in orientation programs for the new graduate nurse moving into nursing practice. As nurses today are expected to take care of more complex patients with accurate assessments, plan interventions, and determine the need for added professional support at the bedside, orientation for the new graduate nurse can be overwhelming. With the added expectations of today's heath care system, nurses struggle with maintaining a level of competence and confidence with non-routine events. Lucas (2014) suggested that nurses of all levels of expertise would benefit from simulation scenarios where they can practice the skills needed for strong clinical performance.

Kaddoura (2010) added that the participation of new graduate nurses in simulation programs for orientation can significantly build their confidence in critical thinking skills, along with improving learning, communication, building of leadership ability, and stress management in a non-threating environment.

In a study of Dartmouth-Hitchcock Medical Center's nurse residency program, simulation was found to evaluate competency development, provide standardized experiences and evaluation, and detect and remediate problems or learning needs early. It has also been found within institutions to be financially beneficial by reducing costs associated with maintaining a competent, professional, and experienced nursing workforce (Bayea, Slattery, & Von Ryn, 2010). Maneval et al. (2012), argued that results from their study evaluating the effect of simulation on critical thinking and clinical decision making skills of new graduates, show that both simulation and class room approaches improve the nurses overall scores.

Simulation and Savings

To consider simulation in relation to hospital orientation, Zigmont et al. (2015) found that experimental learning practices such as simulation provided an opportunity to improve the nurse's transition into practice and alleviate the growing nursing orientation problems that are seen in most hospitals. With inadequate orientation, models are associated with increased turnover, dissatisfaction, lack of confidence, poor skill performance, and decreased patient care and safety. With 25% of sentinel events being related to nursing predominantly because of a lack in training and lack of competency, hospitals can afford to justify high quality orientation models (Zigmont et al., 2015).

With a total of 153 nurses participating in the experimental learning approaches for orientation, new graduate nurses saw a 34% reduction in orientation time, along with a 37% reduction for experienced nurses. This showed an estimated gross savings of $702,270 for the hospital over a 12-month period (Zigmont et al., 2015). Simulation is also used to orient new nurse managers and unit leaders within the hospital setting. It provides an opportunity to develop skills that promote a healthy work environment with optimal outcomes for patients. Simulation also helps increase the novice manager's confidence, improves job satisfaction, and management skills (Radovich et al., 2011).

Simulation and Practicing Nurses

A national priority for hospitalized patients is providing safe and effective care from nursing staff. Identified as one of the 2008 National Patient Safety Goals was recognition of and response to changes in patient conditions. To help raise awareness of patient condition changes, Jacobson et al. (2010) studied the use of simulated clinical scenarios to evaluate for an increase in nurses' awareness. Simulation not only increased the nurse's awareness, but also increased self-confidence in managing patients in complex situations (Jacobson et al., 2010). Schubert (2012) also examined an increase in nursing staff response to changing patient's condition. Failure to rescue events occur when nurses do not recognize, act on, or report the signs of clinical deterioration. In this study, medical-surgical nurses were enrolled in simulation scenarios that mimicked failure to rescue events. The nurses were found to have an 11% increase in critical thinking and knowledge regarding how to act in a failure to rescue event (Schubert, 2012).

Simulation and Specialty

In a study evaluating simulation as a teaching strategy for nursing orientation in cardiac surgery, Rauen (2004) used the saying "think on your feet, not in your seat" to describe simulation. With most learning experiences taking place in the clinical settings, patients are placed at risk. Rauen (2004) used the example of critical care nurses learning to read timing on an intra-aortic balloon pump. With simulation, the critical care nurse is able to learn what happens if the timing is off and trouble shoot alarms. Simulators also have the ability to be given medication and elicit reactions. This gives the nurse the ability to see what a patient may look like during a drug reaction and walk through the steps of immediate treatment. These simulation situations allow for a time of error without harm to the patient. Rauen (2004) described how imperative the use of simulation was within cardiac surgery training. With the use of simulators mimicking different hemodynamic data, nursing staff obtained a deeper understanding of what these numbers meant and provided appropriate care. Simulation offers the safest educational experience without harming the patient (Rauen, 2004).

Another specialty area that utilizes simulation to enhance nursing skills and provide education is obstetrics. With advances in technology and the ability to simulate the birthing experience, orientation, preparation, and professional development practices are changing in the specialty of obstetric nursing. In labor and delivery, new nurses are often scared to take a hands-on approach since their primary role has been observational. With the use of repeated simulation and practice, there has been a decrease in nurse's fear in working within the new specialty of obstetrics (Ferguson, Howell, & Parsons, 2014).

One specialty area outside of nursing, where repeated simulation experiences have shown an increase in self-confidence, is training of medical students in the military. When military personnel are in the field and an emergency occurs, the medical staff have to be quick on their feet and make split-second decisions. Repeated simulation scenarios with the military medical staff help to develop this ability, effectively saving patient's lives (Goodwin, Goolsby, & Vest, 2014).

Development of simulator programs have been deemed exciting and enlightening for faculty and new nurses. Not only are simulator programs becoming more popular in the academic setting but for all of healthcare, including nursing they are emerging in clinical work settings as well. Educators can develop programs to enhance hands-on learning with actual patients by practicing with simulators. The more simulator programs used in the academic or practice setting, the more comfortable nurses become (Ackermann et al., 2007). While orientation is known to be a time for learning new equipment and policies for a facility, it is essential to evaluate the use of simulation among practicing nurses in the hospital setting.

CHAPTER III

Methodology

Simulation has been seen to improve self-confidence in nursing students, medicine, and physical therapy practices. There has been insufficient research evaluating the use of simulation and practicing nurses. The purpose of this study was to evaluate if the use of simulation in hospital nursing orientation improves nurses' self-confidence when implementing the hospital Heparin Nomogram on the hospital IV pump using dose mode.

Study Design

Using a quantitative, descriptive design, data was collected using a Likert scale titled the Confidence Scale (C-scale) created by Dr. Susan Grundy. The pre-C-scale survey was given to the subjects at the beginning of simulation day of hospital nursing orientation. A post-survey of the C-scale was given at the end of a debriefing session at the conclusion of the simulation day. The scale evaluates the confidence level of new hire nurses when implementing the Heparin Nomogram and using the hospital IV pump. The simulation scenario that was evaluated provided the nurse with the opportunity to utilize the Heparin Nomogram and dose mode on the hospital IV pump.

Setting and Sample

This study was conducted at a local community college simulation hospital. Area hospitals utilize this facility to conduct parts of nursing orientation. The simulation hospital is set up with high-fidelity simulators that provide the ability to produce heart and lung sounds, and provide real-time ECG and vital sign monitoring. There is also the ability for students to infuse IV solutions, place Foley catheters, insert nasogastric tubes,

and participate in the birthing process. The simulation hospital resembles an acute care hospital. The simulation hospital is equipped with several different suites. There is a critical care unit with four beds, an acute care suite with five beds, an obstetrics suite, and an operating room suite. Each unit has a hospital bed and state of the art hemodynamic monitoring systems that display heart rhythms and live vital signs, IV pumps, ventilators, and specialty equipment needed for that particular suite.

The nurses from one area hospital that utilizes the simulation hospital for monthly orientation were chosen for participation in this study. There are two days of orientation conducted at the community college simulation hospital each month. On day one, the new hire nurse sits in class for a presentation on hospital policy and procedures and reviews common hospital equipment. After each presentation, the nurses are taken into a simulation room and the presentation is demonstrated on the simulator. The nurses have the opportunity for hands on learning and are allowed to ask questions.

On day two at the simulation hospital, different scenarios are presented to the nurses in small groups. They work through each scenario on the simulator and demonstrate use of hospital equipment. Data collection occurred on day two of orientation at the simulation hospital.

All medical-surgical and emergency department nurses participate in this orientation process. The medical-surgical division within the hospital includes: medical unit, surgical unit, intermediate care unit, critical care unit, and oncology unit. Therefore, nurses from these units, along with the emergency department, were recruited for this study. All other hospital unit nurses were excluded because other units do not utilize general hospital nursing orientation. Nurses who have been employed with the

organization within the past 12 months in any capacity were also excluded. If these

nurses had been employed with the organization within the past 12 months they already

have knowledge of hospital policy, procedures. An average of five to ten nurses were

present at monthly orientation, therefore a sample size of 30 was desired.

Design for Data Collection

For the purpose of this study, the implementation of a Heparin drip, titration of

the drip, and the use of IV Dose Mode was evaluated. IV Dose Mode is the function on

the hospital IV pump that house the drug libraries. This is where the nurse can pull up a

specific drug and concentration and enter required information such as the patient's

weight. The IV pump will then do the dosage calculation for the nurse and drip the

medication at the appropriate rate. This is a way for the nurse to double check dosage

calculation to ensure accuracy. At the start of the day the participants were asked to fill

out the Confidence Scale (C-Scale) to evaluate their current confidence levels with the

Heparin Nomogram and the use of the hospital IV pump. A letter of informed consent

was provided at the start of the day. As the day progressed there was a total of five

scenarios that the nurses were asked to complete. The scenario that was used for the

purpose of this study was the patient with a diagnoses of a deep vein thrombosis. The

patient originally comes into the hospital after a fall with a broken hip. The patient

undergoes surgery to fix the hip fracture but becomes septic postoperatively. The nurse

notices that the patient loses their pedal pulse in the affected limb. The patient also

complains with pain from the affected leg. The nurse phones the healthcare provider for

the assessment findings. An order is given from the provider for a venous doppler of the

lower extremity. The results are positive for a clot. The nurse phones the provider with

the results and receives an order to initiate the hospital's Heparin Nomogram. The nurse then reviews that patient's current labs and proceeds to set up a Heparin drip on the simulator by following the hospital nomogram. As the scenario progresses the nurse will ask the instructor, who is acting as the narrator, what the current PTT is on the patient. The narrator provides a lab value and the nurse proceeds to adjust the Heparin dose according to the hospital's heparin nomogram. The nurse also follows hospital policy with two nurses verifying the correct dose is programed into the pump. The scenario does not alter from group to group, and there is a written script to be followed which was developed by the hospital's education program. After the last debriefing session of the day the C-scale is given again for the nurses to fill out to evaluate their self-confidence post simulation, with regards to the Heparin nomogram and use of the hospital IV pump.

The Heparin nomogram scenario was chosen to be evaluated due to it including a common hospital protocol along with interaction of common hospital equipment. The C-Scale was chosen to evaluate the confidence within the nurse due to its ease of use with minimal time requirement and the fact it gives a numerical value for the participant's confidence.

Measurement Methods

The Confidence Scale (C-Scale) was used in measuring the confidence level on the new hired nurses in a pre and post-survey format. Susan Grundy (1993) believes that confidence is considered an important aspect of delivering nursing care to others. Grundy provides the C-scale survey to assess nurse's confidence in physical assessment to test the tools reliability and validity. She chose to use physical assessment because of its level of importance in the nursing profession. Grundy developed the C-scale scores to correlate

with a 100-mm confidence visual analogue scale and also a confidence verbal descriptor scale. The C-scale is one page in length and poses five statements to be answered by Likert-type scale. The scale gives the participant a number range to select from ranging from one, being no confidence to five, being extremely confident. The participant placed a circle around the appropriate number that corresponded with their confidence level. Researchers add each of the circled numbers the subject develops a score between five (low confidence) to 25 (high confidence) (Grundy, 1993).

To establish validity C-scale was given to 39 students four times over a semester. Also, 22 staff nurses at a local hospital with at least one year of experience were recruited to participate in this study. The nurses were practicing on a medical-surgical unit with ages ranging from 29-52. In the final analysis five students were dropped from the study because they left the nursing program. When comparing the mean score of students (13.6 at six weeks, 18.5 at the end of the semester) to that of the experienced nurses (21.7), the mean score of the practicing nurses was significantly higher student scores. The C-scale was correlated with two other confidence surveys. The correlation coefficients between the C-scale to the C-VAS and C-VAD demonstrated the same significant increases at the end of the semester (Grundy, 1993).

There was consistent demonstration of high internal consistency reliability throughout all periods of administration to both students and experienced nurse with the use of the C-Scale. Throughout the study, construct validity of the C-Scale was supported by the results of both the students who are learning physical assessment techniques, and the experienced nurses' application of the physical assessment. As the developer expected, there were significant increases in confidence in nursing students that

contribute to the validity of the C-Scale. Concurrent validity was demonstrated by comparing the C-Scale two other scales, both of which showed high correlations with the C-Scale (Grundy, 1993).

Data Collection Procedure

The primary investigator collected data throughout the study. The only data that was collected throughout this study includes the C-Scale. The five components that were evaluated within the C-Scale included: performance certainty, hesitation, competence, sureness, and satisfaction. The study began with the March session of nursing orientation and concluded with the June session of nursing orientation. The data was collected at the beginning of day two at the simulation hospital and at the end of the day after the debriefing session.

Protection of Human Subjects

Measures were taken to ensure that each participant remained anonymous during data collection and the data analysis process. Participants provided the last three digits of their employee ID number on the pre and post C-Scale. This was only used to pair the pre and post scales. The employee ID number is only known to the employee and human resources. By using the last three digits of the six digit number the participant was not identifiable. Completed data analysis will be stored in a locked area at the university for three years. Data collected over the study was housed in a private electronic folder that required two levels of password protection. After all data was collected and analyzed surveys were shredded. This study provided benefit to the participants and to the educational department within the hospital organization. The participants were provided a

time of reflection while filling out the post scale. It also benefited to the organization, providing a way to evaluate their orientation program.

Data Analysis

Data was entered and analyzed using the SPSS software. The data was entered and analyzed by the primary investigator. Descriptive statistics that were utilized in data analysis include: mean, standard deviation, percentages, and frequencies. Inferential statistics that were utilized include the t-test. It was believed that study results would show an overall increase in self-confidence in new hire nurses by utilizing simulation in nursing orientation when implementing the hospital Heparin Nomogram with the use of the hospital IV pump.

CHAPTER IV

Results

Simulation has been examined in nursing students, physical therapy, military, and aviation with regards to improving self-confidence. There has been limited research evaluating the effect that simulation has on self-confidence with practicing nurses. The purpose of the Simulation in Orientation Study is to evaluate the effectiveness simulation has on new hire nurse's self-confidence when implementing the hospital Heparin Nomogram when using the hospital IV pump in dose mode.

Sample Characteristics

At the completion of the study the final sample size consisted of 18 new hire registered nurses. Participants included new graduates and experienced nurses from medical-surgical units. They completed all five questions on the Likert scale of the pre- and post-survey. There were no nonresponses, withdrawals, or losses within the study time frame from March to June.

Major Findings

Findings were based on the total scores received from the five point Likert Confidence Scale that was given prior to simulation and post-simulation and was then compared. To begin the mean scores of the pre and post surveys were evaluated. Data was analyzed using SPSS software. The final mean score of the pre-survey is 11.11 with a standard deviation of 4.993. The final mean score of the post-survey is 17.22 with a standard deviation of 4.930. This shows an increase in the overall mean score in the post-survey. See Table 1 for a comparison of the two mean scores.

Table 1

Frequencies

Statistics		Pre Score	Post Score
N	Valid	18	18
	Missing	0	0
Mean		11.11	17.22
Std. Deviation		4.993	4.930
Skewness		.778	.105
Std. Error of Skewness		.536	.536

Percentages of overall scores on pre and post-surveys were evaluated. In looking at high and low scores on the pre-survey 11% of the participants scored five and 16.7% scored 20 prior to being exposed to simulation. Scores increased on the post-survey with 5.6% of participants scoring 9 and 11.1% scoring 25 after being exposed to simulation. See Table 2 and 3 for Score Percentage Evaluation. Figure 1 evaluates the mean scores in a histogram format. This provides a clear visual of four participants scoring 15 in the post survey. In the pre survey the highest scores are seen with six participants scoring nine. Figure 2 shows the pre and post survey scores in box plot graphs. This makes a clear visual of the mean score being raised after exposure to simulation. By evaluating the histogram and box plots there is visual evidence suggesting that confidence levels are raised with simulation.

Table 2

Pre-Survey Score Percentage Evaluation

		Pre-Score			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	2	11.1	11.1	11.1
	6	1	5.6	5.6	16.7
	8	5	27.8	27.8	44.4
	9	1	5.6	5.6	50.0
	10	1	5.6	5.6	55.6
	11	2	11.1	11.1	66.7
	14	2	11.1	11.1	77.8
	15	1	5.6	5.6	83.3
	20	3	16.7	16.7	100.0
	Total	18	100.0	100.0	

Table 3

Post-Survey Score Percentage Evaluation

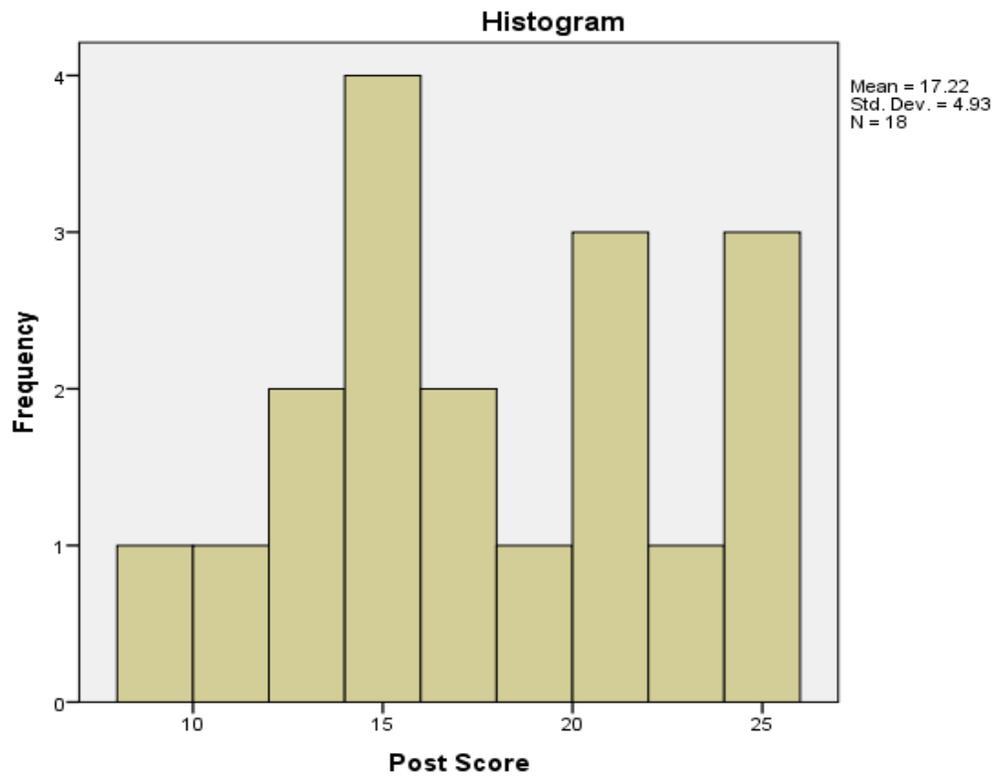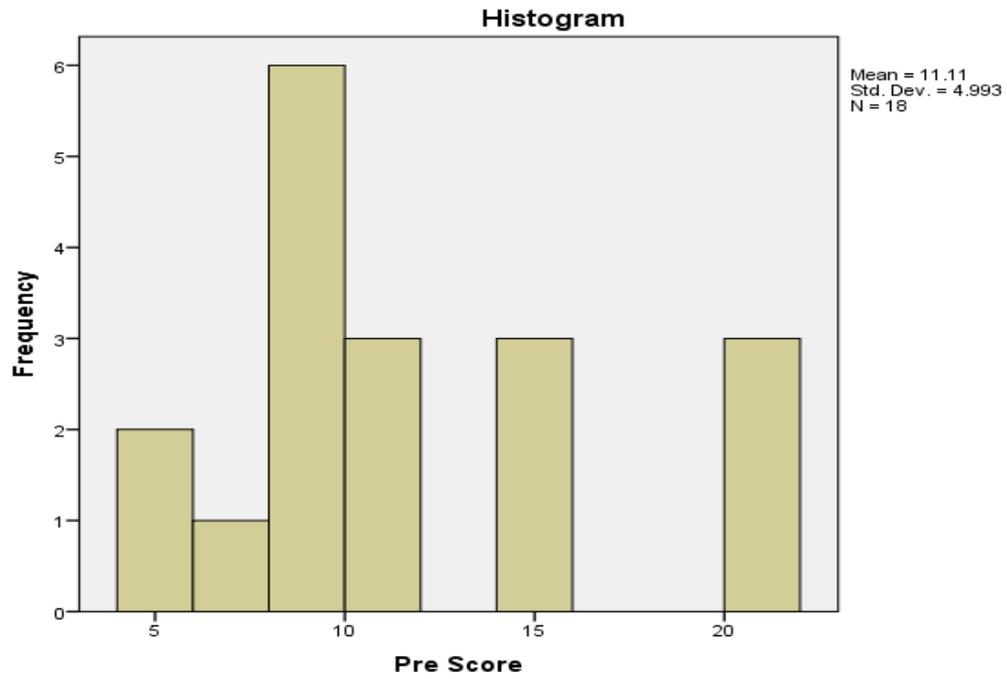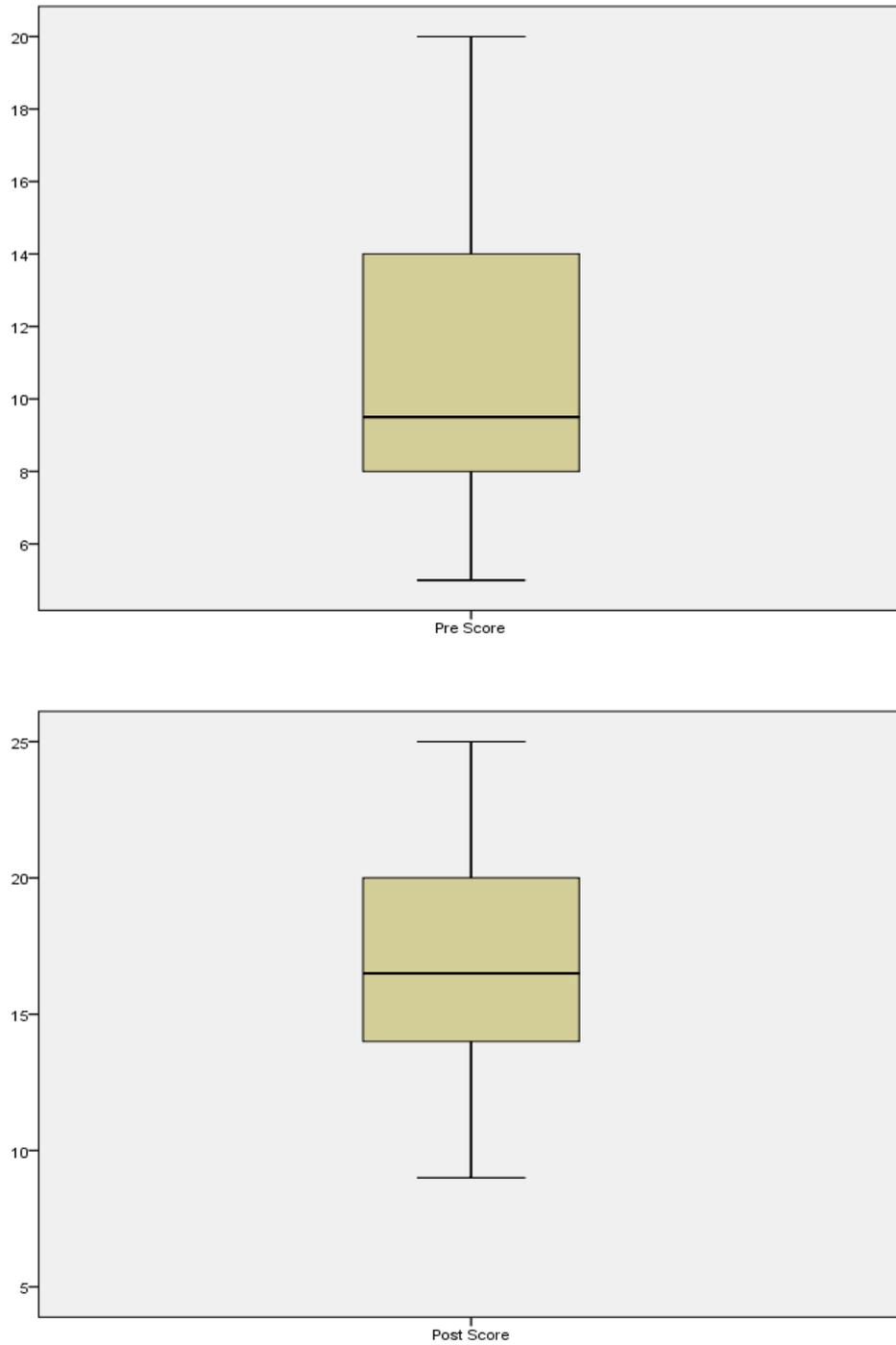|		Post-Score		
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 9	1	5.6	5.6	5.6
10	1	5.6	5.6	11.1
12	1	5.6	5.6	16.7
13	1	5.6	5.6	22.2
14	2	11.1	11.1	33.3
15	2	11.1	11.1	44.4
16	1	5.6	5.6	50.0
17	1	5.6	5.6	55.6
19	1	5.6	5.6	61.1
20	3	16.7	16.7	77.8
22	1	5.6	5.6	83.3
24	1	5.6	5.6	88.9
25	2	11.1	11.1	100.0
Total	18	100.0	100.0	

Figure 1. Histograms

Figure 2. Box Plot of Mean Scores

Data was further analyzed using paired t-test to determine if there was a significant difference between the pre and post-survey. The paired t-test was chosen to analyze the data since there was a comparison of the response of two treatments, pre and post simulation. The participants were measured in the same day before and after exposure to simulation. With a p-value of 0.000 being less than 0.001 there is a significant difference seen in the pre- and post-surveys. See Table 4 for data analysis for the paired t-test. With the statistical data presented it is found that the data suggest that participation in simulation leads to higher levels of confidence in newly hired nurses with the use of hospital equipment when administering heparin.

Table 4

Paired t-test

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pre-Score – Post-Score	-6.111	3.123	.736	-7.664	-4.558	-8.303	17	.000

Paired Samples Statistics

		Mean	N	Std Deviation	Std. Error Mean
Pair 1	Pre-Score	11.11	18	4.993	1.177
	Post-Score	17.22	18	4.930	1.162

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Pre-Score & Post-Score	18	.802	.000

The data collected through the Simulation in Orientation Study suggested that simulation does increase the self-confidence of the new hired nurse when implementing hospital policy such as the Heparin Nomogram with administration using the hospital IV pump in dose mode. The mean and standard deviation, overall score percentages and frequencies, and lastly a paired t-test were utilized to support the hypothesis

CHAPTER V

Discussion

Simulation has been studied in various roles of the medical field to evaluate its impact on self-confidence. It has been shown to be effective in improving outcomes such as failure to rescue events, vascular surgery, and physical therapy. The relationship between simulation and self-confidence has not been studied in-depth with practicing nurses in the hospital setting. The purpose of the Simulation in Orientation Study was to evaluate the impact of simulation on self-confidence in new hire nurses when using the Heparin Nomogram and the hospital IV pump in dose mode.

Implication of Findings

When evaluating the Simulation in Orientation Study a pre and post Likert scale was given to participants on simulation day. The scales were graded and the mean scores were compared. It was found that the mean score of the pre survey was 11.11, while the mean score of the post survey was 17.22. This showed a 6.11 point increase in scores after the participant was exposed to simulation. In evaluating individual scores 27.8% of participants scored eight on the pre-survey, when 16.7% scored 20 on the post-survey. When looking at the paired t-test there was a significant difference found between the pre and post scores. Data analysis from the study suggested that self-confidence is increased with the use of simulation.

The data analysis is comparable to other disciplines that have studied the use of simulation and its effects on self-confidence. Simulation was used on training physical therapist working with patients in critical care. Prior to simulation confidence scores ranged from 5% to 51%, and post training with simulation scores ranged from 35% to

86% (Ohtake et al., 2013). Looking at a study conducted on medical students training in the emergency department, simulation was used for opportunities that are limited for students to learn. After simulation confidence scores increased 4.2 points immediately after training and remained high to the end of the internship (Goodwin et al., 2014). A look at the effectiveness of teaching preclinical skills to medical students with simulations revealed students reporting a 96% enhanced learning experience (Swamy et al., 2014).

Application to Theoretical/Conceptual Framework

In the Simulation in Orientation Study only new hire nurses were sampled. These individuals had not been employed with the organization within the past 12 months. These nurses were unfamiliar with the hospital policy and equipment. In comparing this setting to Patricia Benner's Novice to Expert theory, all new hire nurses could be categorized as novices at the pre-survey. When the time arose to complete a hospital based policy they all were brand new to the experience. The years of service and clinical background varied from nurse to nurse. Benner model is described as situational based, not trait based. The stage a nurse is categorized into is based on the nurses' familiarity with a particular setting (Alligood, 2014, Chapter 9). While looking at Benner's theory in relation to simulation Benner expresses that with the use of experiential learning nurses develop notions of good practice that are constantly being expanded (Benner, 2000). In nursing orientation all nurses start at the novice level, however when simulation is added self-confidence is increased and nurses progress toward the expert level. (Appendix A)

Limitations

One limitation to the Simulation in Orientation Study was the sample size. There were 18 new hire nurses between the months of March and June. Turnover rates were low at the organization during this time. The hospital upgraded to new IV smart pumps at the end of June. Therefore, nursing orientation was smaller during the month of June due to continuous in house nursing education on implementation of new IV pumps.

If the nurse's experience levels would have provided data on evaluating if simulation improved self-confidence increased with years of experience. Also, if the participant's past exposure to simulation would have been examined then data could have reflected a variation in self-confidence. An alteration in data may have been seen if more than one hospital policy and multiple pieces of equipment had been evaluated.

Implications for Nursing

The data results showed a significant difference in confidence levels from pre to post simulation. This suggested that simulation promotes increased self-confidence within the nursing profession. The study supported the idea that with simulation new hire nurses are able to begin work on their new unit with increased self-confidence. Clinical competency and confidence is critical for increased performance outcomes. With the current financial constraints and shortage of qualified staff to train new hired nurses it is vital for hospitals to find new ways to build confidence in nurses with continued competence (Ackermann et al. 2007).

One way to ensure nursing skills are kept up to date with today's latest evidence based practice is yearly competency training with simulation. This ensures that nursing skills are validated in a safe environment that provides room for error. Simulation would

prove to be valuable when training a hospital unit on a new hospital procedure. For example a growing trend seen in treatment of cardiac arrest is therapeutic hypothermia, which involves complex nursing skills. It would be beneficial for nursing staff to be able to learn how to effectively care for the therapeutic hypothermia patient in a controlled environment. In this scenario all of the potential complications could be acted upon in the simulation lab so that the nurse is prepared for any situation that may arise during actual care of the patient. This would also provide the nurse with the self-confidence needed to practice strong skills at the bedside. An advantage to simulation would be seen within nurse refresher courses. These nurses hold nursing skills that have not been put to use over a long period of time. Simulation provides them with environment to practice and prefect skills and increase self-confidence prior to stepping back to the bedside.

As the future of nursing continues to evolve it is essential to look for new interactive ways to educate nurses away from the bedside. As patients become more acute and greater demands are placed at the bedside, nursing education must be placed at the forefront to ensure that the nurses' skills are validated. Simulation provides a safe, slow paced practice platform for nurses to learn and prefect their skills.

<center>**Recommendations**</center>

A larger group with an extended study period over multisite would be beneficial for future research on simulation with practicing nurses in orientation. With an extended study period there would be flexibility for high and low turnover rates, and inclusion of new graduate nurses. It would be valuable to compare the confidence levels in new hire experienced nurses versus new graduate nurses in orientation, and who has had exposure to simulation in the past.

Conclusion

Study results suggested that simulation increases self-confidence in new hire nurses ability to implement a Heparin Nomogram and utilize dose mode on the hospital IV pump. In the fast paced world of healthcare, it is mandatory that nursing be able to function at the bedside with complete confidence and competence. Simulation provides an environment for skills to be validated in a controlled setting. With simulation used to acquire new skills and validate old ones, self-confidence will be seen in higher levels at the bedside. Nurses will shift from novice to expert in their clinical setting. As simulation has become a standard in other healthcare professions it is essential to further evaluate its value in the hospital setting.

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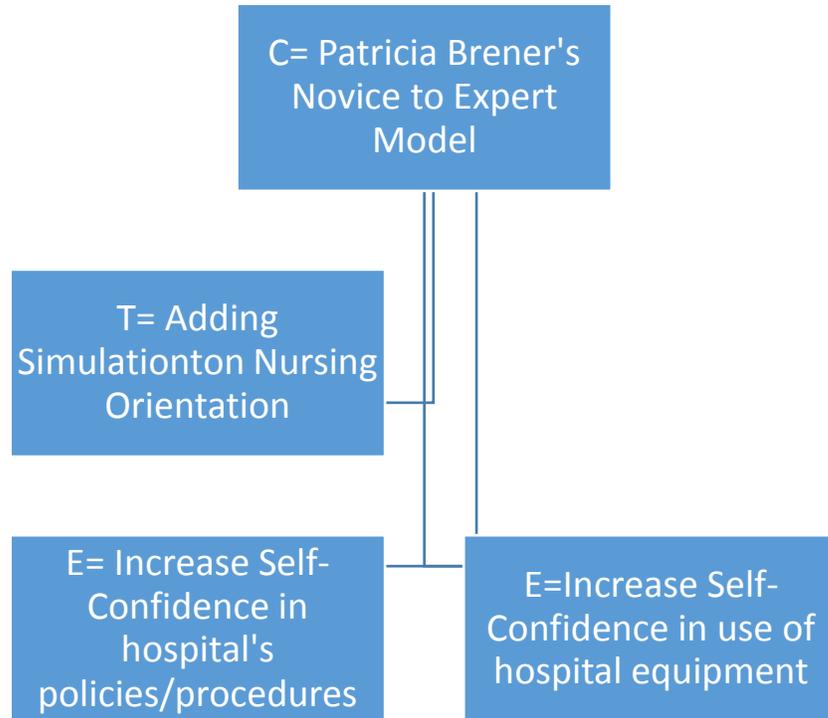
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Appendix A: CTE Digraph

C= Patricia Brener's Novice to Expert Model

T= Adding Simulationton Nursing Orientation

E= Increase Self-Confidence in hospital's policies/procedures

E=Increase Self-Confidence in use of hospital equipment

By adding simulation to new hire nursing orientation, the nurse is going to show an increase in self-confidence in the use of hospital policies and procedures along with increased confidence with the use of hospital equipment.