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The University of Southern Mississippi

SIMULATION AND EDUCATIONAL STRATEGIES TO DECREASE
THE INCIDENCE OF MEDICATION ERRORS IN A SMALL
RURAL ACUTE CARE HOSPITAL

by

Queen Victoria Walters

Abstract of a Capstone Project
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Nursing Practice

August 2015

ABSTRACT

SIMULATION AND EDUCATIONAL STRATEGIES TO DECREASE
THE INCIDENCE OF MEDICATION ERRORS IN A SMALL
RURAL ACUTE CARE HOSPITAL

by Queen Victoria Walters

August 2015

The Institute of Medicine (IOM) (2007) estimates that 1.5 million medical errors occur per year. Medication errors are the leading medical error. Medication errors are defined as adverse drug events and are 100% preventable. Some categories of adverse drug events include, medications administered at the wrong time, by the wrong route, using the wrong method of administration, and administration of the wrong dose of medication. Adverse drug events also include administration of an overdose of medication, or the omission of medications as well as administering the wrong medication.

The purpose of this capstone project was to increase the competency of nurses who administer medications that will ultimately result in improved patient outcomes. A pre-test was administered to determine the competency of each participating nurse. Evidence-based information related to medication administration was presented to the participants, followed by completion of a simulated medication administration scenario. The Creighton Competency Evaluation Instrument was used to evaluate each nurse competency in administering medications. Two weeks later, a post-test was administered to determine retention of knowledge.

Significant differences were observed between the pre-test and the post-test. The nurses who participated in the didactic session, followed by a hands on simulation of medication administration, demonstrated an increase in competency related to medication administration. This capstone project provides evidence that information in conjunction with simulation does improve the competency of nurses related to medication administration.

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A Capstone Project
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Approved:

Dr. Kathleen R. Masters, Committee Chair
Professor, Collaborative Nursing Care

Dr. Mary J. Butts, Committee Member
Professor, Systems Leadership and Health Outcomes

Dr. Cathy K. Hughes, Committee Member
Assistant Professor, Collaborative Nursing Care

Dr. Karen S. Coats
Dean of the Graduate School

August 2015

DEDICATION

I would like to express sincere thanks to my husband for supporting me throughout this long process. My husband has provided love, support, and patience, as I have completed this capstone project. Without this support system, this new segment of our lives would not be possible.

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LIST OF ABBREVIATIONS

AACN	American Association of Colleges of Nursing
ANA	American Nurses Association
CCEI	Creighton Competency Evaluation Instrument
DNP	Doctorate of Nursing Practice
FDA	Food and Drug Administration
IOM	Institute of Medicine
ISMP	Institute of Safe Medicine Practice
NCSBN	National Council of State Boards of Nursing
NPP	National Priorities Partnership
QI	Quality Indicators

CHAPTER I

INTRODUCTION

The Institute of Medicine [IOM] (2007) estimates that 1.5 million medical errors occur per year. Medication errors are the leading cause of medical errors. Medication errors range from the omission of a medication, overdose of medication, to the wrong medication. In the United States, medication errors cost over three billion dollars annually. The Institute of Safe Medication Practice [ISMP], 2013, reports that in 2011, there were 30,725 deaths, related to medication errors. In 2012, there was a 47.8% increase, to 45,421 deaths related to medication errors. The total cost for this type of error is measured by lost income, disability, loss of household productivity, and health care costs. It is estimated that 70% of adverse medication events are preventable (Dracup & Bryan-Brown, 2003).

Medication errors are a critical issue in health care settings. All health care team members agree that there is a problem, but there is no agreement related to how to correct this growing issue (Katz, Navon, Navy, & Stern, 2005). Medication errors are defined as any deviation from the procedures, policies, and/or best practices for medication administration (Mayo & Duncan, 2004).

Medication errors are a serious issue in health care today. The threat of punishment from the health care facility is one of the most important reasons for not reporting medication errors. The purpose of this capstone project is to provide information related to medication errors to increase the competency of nurses. An additional purpose is to provide health care facilities with a plan to encourage nurses to report medication errors without the threat of sanctions from the employer.

Medication administration is a task essential in the scope of practice for nurses. Nurses are reluctant to report that they have deviated from the standard, or the physician's orders. At times, nurses cut corners when administering medications. The literature review indicates that on average every third patient is exposed to some type of deviation from the standard when receiving medications. The failure to report medication errors makes research difficult and solutions almost impossible (Ramanujan & Goodman, 2003). Nurses must first recognize a medication error before the reporting process can begin.

Medication Errors

Although the administrators of the health care organization have provided numerous programs and activities for staff nurses in an effort to decrease medication errors, there has been no noticeable reduction in medication errors in the ten years since the release of the IOM Reports (2010). In 2004, there were over 190,000 deaths directly credited to medication errors. The common assumption is that the health care provider is the single cause of errors. The focus is changing, and current practices examine why medication errors occur rather than blaming the provider. Identification of the classification of medication errors as well as actionable items that can correct the likelihood of medication errors need examination in order to prevent future errors (Bogner, 2009).

Jones and Treiber, (2010) conducted a study to determine nurse's perceptions of reduced medication errors. This study also looked at the nurses' personal medication errors. The study questionnaires were sent to 2472 Georgia nurses. Of these, 202 nurses responded to the survey. A quantitative analysis was performed on the results. Ninety four percent of the respondents agreed that medication errors should be reported. Seventy

four percent of respondents thought that barcode scanning reduced medication errors. Seventy seven percent of respondents admitted that they did not follow the 5 rights of medication administration. Of the 202 respondents, 78% admitted to making at least 1 medication error.

The reporting of medication errors depends on the nurse to be honest and feel free of retribution. According to current estimates, medication errors are responsible for 116 million extra health care provider visits per year. Some cited reasons that contribute to medication errors include inexperience, fatigue, new or unfamiliar procedures, nurse to patient ratio, similar sounding or look alike medications, illegible handwriting, calculation errors, prescribing errors, omissions, overdosing, and simply failing to report medication errors (Weingart, Wilson, Gibberd, & Harrison, 2000).

Medication administration is a patient-focused task that is deeply rooted within the nursing profession. Every nurse responsible for medication administration is at risk for committing a medication error. Reports indicate that the incidents of medication errors may occur as frequently as 19-25% of the time during a normal shift. A single nurse may potentially administer as many as 50 different medications per shift (Rassin, Kanti, & Silner, 2005), which translates into 9.5 to 12.5 medication errors per shift.

The Institute for Safe Medication Practices (ISMP, 2013) reports that during 2012, the Food and Drug Administration (FDA) received 210,648 reports of serious medication errors. This is a 16% increase from the previous year. The report identified an overall decline in medication errors reported to the FDA, that were directly from consumers and health care facilities. The 16% increase is accounted for by reports from drug manufacturers. The FDA reports, there are limitations to this report as these voluntary

reports are small in comparison to the number of medication errors. The FDA states, these numbers are very small when compared to a million hospital stays and 100,000 deaths annually (ISMP, 2013).

Medication errors may occur at any phase of the process; prescribing, transcribing, dispensing, administration of medications, or in the monitoring phase of patient response to the medication. Administration errors are responsible for 26% to 32% of the total number of medication errors. Nurses are the health care providers that administer most medications. Continuing education for nurses can help decrease the incidence of medication errors. Nurses should be educated on new medications, procedures, and protocols (Anderson & Townsend, 2010).

According to The National Priorities Partnership [NPP] (2010), there were approximately 4 million patients subjected to medication errors, with a cost of \$16.4 billion annually. About 37% of these preventable medication errors are directly related to dosing mistakes. Twenty two percent of medication errors occur during administration of medications. Bar coding and e-prescribing have proven effective in decreasing medication errors.

Medication error is not just an issue in the United States, it is a global issue in health care. A quasi-experiment conducted in one large teaching hospital in China concluded that implementing five management intervention strategies could reduce medication errors. By implementing these strategies, nurses' mindfulness and skills of medication safety are improved, and patient satisfaction is improved. The five strategies implemented included: continuing education, improving medication policies, clarifying

drug classification management, improving safety of intravenous medications, and supervising medication administration (Xu, Li, Ye, & Lu, 2014).

Technology

Technology that includes patient safety devices such as bar-code medication administration, computerized dispensing, and electronic health records are essential means of improving a culture of safety and reducing the incidence of medication errors (Jones & Treiber, 2012). Electronic order entry and e-mars are also methods of decreasing the number of medication errors within the health care setting. Although these innovations do increase safety and reduce medication errors, some adverse effects related to technology include reduction in the amount of time the nurse spends with the patient, delays in medication administration, and patient dissatisfaction (Jones & Treiber, 2012).

Human patient simulation is state-of-the-art technology that assists the nurse to learn skills. Simulation improves acquisition and retention of knowledge. Nurses are able to perform nursing skills quicker and more accurately when using simulation during training. Simulation is an important tool used to remediate nurses in the acquisition of clinical skills. The nurse is given a short realistic scenario. In the simulated environment, the nurse is able to perform the skill as many times as needed to become proficient (Bremner, Aduddell, Bennett, & VanGeest, 2006).

Harris, Pittiglio, Newton, and Moore, (2014) conducted a quasi-experimental pilot study to determine if simulation teaching methods were effective in improving medication calculations and administration skills. One group of participants attended a didactic medication review session, while the other group of participants participated in a medication administration simulation review. Results revealed that the simulation group

scored significantly higher (m=95 percent, SD=6.8) and, the didactic group scored lower (m= 90, SD= 12.9).

Ferguson, DeLaney, and Hardy (2014), conducted a study to determine if teaching medication administration using simulation helped to decrease the incidence of medication errors. This experiment was conducted using 51 first semester nursing students. The findings of this experiment revealed a reduction in the number of medication errors compared to previous classes taught without simulation. If simulation helps decrease medication errors in students who have limited knowledge, simulation may also be an effective learning strategy for nurses working in health care facilities.

The Creighton Competency Evaluation Instrument (CCEI) (Appendix A) will be used to assess competency during the simulation phase of this capstone project. The CCEI is a 23-item tool used to monitor participants in a simulation setting. Not all items on the CCEI are used in every simulation exercise. Items are selected to determine the competency as it relates to the simulation exercise. Competencies include assessment, communication, clinical judgment, and patient safety (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014).

Teaching

Using conventional didactic teaching methodologies alone, the health care provider is more likely to forget critical elements (Bogner, 2009) since there is no opportunity for practice and repetition of the learned skill. Bogner believes that conventional methods of training are not as effective as methods that incorporate technology and repetition, such as simulation provide the nurse with the opportunity to develop skill proficiency in an environment that does not pose a risk to patient safety.

This capstone project will include visual, auditory, and kinesthetic learning methods to maximize learning for participants with various learning style performances.

Doctor of Nursing Practice

The Doctor of Nursing Practice (DNP) capstone project is a comprehensive scholarly work concentrating on a complex practice-based problem, using existing evidence to propose, analyze, and evaluate an intervention (Zaccagnini & White, 2014). This capstone project will consist of an examination of the practice-based problem of medication errors by defining the problem, reviewing evidence in the research literature related to medication errors, development and implementation of a plan to mitigate errors. Analysis of the associated risks, outlining project objectives, discussion of the findings, and recommendations for practice change is also addressed.

Needs Assessment

The population of focus for this project consists of patients admitted to an acute health care facility. The facility for this project is Pearl River County Hospital, a rural 24-bed critical access facility providing health care services to Pearl River County and surrounding counties. This facility is a county owned hospital receiving federal funding; thus, all patients are provided with medical care, regardless of health insurance or money for payment. Building relationships, improving communication, and providing education to the nurses will be required to facilitate change at Pearl River County Hospital. This capstone project will involve remediation and skills practice of nurses who administer medications. The expected outcome is to have a decrease incidence of medication errors in the population of patients served by the acute care facility.

The Agency for Healthcare Research and Quality provides healthcare Facilities with a list of Quality Indicators (QI) used to help hospitals identify potential problem areas that might need further study. The health need identified is patient safety. The desired outcome is to educate nurses to identify interventions that will lead to a decrease in the number of medication errors, thereby increasing patient safety. The identified interventions should decrease adverse events, length of stay, and cost to the facility. An interview with the nursing staff of the education department revealed that there are three to four medication errors reported every shift. Based on reports in the literature, there are many more medications errors that go unreported each shift. For a project such as this to be successful, all members of the organization will need to be involved in the process. The administration must provide access to the facility, nurse managers must agree to the proposed project, and the nurses administering medications must be receptive to change. There must be a mutual trust between all parties involved. The stakeholders for this capstone project include hospital administration, education, nurse managers, staff nurses, and quality management. A contract exists between the author's educational institution and the health care facility.

The cost related to implementation of this project is minimal. The work related to the project, the pre-test, post-test, presentation, and the simulation exercise will be completed by the Doctorate of Nursing Practice student. The hospital has granted permission to use the printers within the education department, and the simulation will be performed in the hospital's educational department. The simulation lab at the hospital is available at no cost to the DNP student. The hospital will be providing the educational space to

implement the project. The benefits to this educational activity greatly outweigh the cost to the facility, compared to the cost of medication errors.

Problem Statement

Medication error is a patient safety issue that must be addressed in all health care facilities. Implementing educational measures to validate competency within the context of a no blame culture will enable health care facilities to reduce the incidence of medication errors.

Purpose Statement

The ultimate purpose of the DNP Capstone Project is to decrease the incidence of medication errors at Pearl River County Hospital. The exact purpose of the project is to implement an educational intervention to validate competency in medication administration among nurses and facilitate the introduction of a no blame culture within the facility. The project will include methodologies that include testing knowledge of nurses, presenting educational material, involving the nurses in a simulation exercise, and retesting.

PICO

Population: All nurses employed in inpatient facilities

Intervention: Medication administration module and simulation check-off

Comparison: Medication administration module without simulation check-off

Outcome: The nurses in the facility will have increased competencies and decreased number of medication errors, which will improve patient outcomes.

PICO Question

In all nurses employed in inpatient facilities with reported medication errors, how effective are medication administration modules and simulation check-offs compared to

medication administration modules, only in increasing competencies and decreasing the occurrence of medication errors?

Theoretical Framework

The just culture model focuses on three duties that are balanced between the organizational values and the individual values. The three duties include the duty to avoid causing risk or harm, the duty to produce an outcome, and the duty to follow procedural rule. The values include safety, cost, effectiveness, equity, and dignity. A just culture is about creating an open, fair, and just culture for all, creating a learning culture, designing safe systems, and managing behavioral choices. This model is not about seeing events that need to be fixed, but about seeing opportunities to improve. The concept of a just culture is about changing expectations. Health care providers should look for risks around them, report errors, help design safe systems, and make safe choices (Marx, 2007).

The just culture model is about shifting from a blame culture to a constructive culture. Individuals are accountable for their actions if they knowingly cause harm, or violate the policies and procedures of the facility. The just culture does not tolerate disregard to patient safety or misconduct such as falsifying medical records, or performing nursing duties while impaired. Implementation of this model will enable the nurse to report medication errors without the fear of punishment, (Marx, 2007)

Jean Watson's caring theory seems to be the complement to the just culture model. The just culture model and Watson's caring theory are based on being caring to self and others. Watson's theory consists of ten caritas factors. Watson uses caritas which is Latin for "to cherish, to appreciate, to give special attention" to define her theory of caring (Watson, 2008). The formation of a humanistic-altruistic system of values relates to

loving kindness. Three of Watson's caritas can be directly related to medication administration and preventing errors.

Caritas 1: Cultivating the Practice of Loving Kindness and Equanimity Towards Self and Others as Foundational to Caritas Consciousness encourages nurses to care for themselves and fulfillment in their life and work. Nurses should be models and become a part of a global vision of health. Centering is another exercise that provides nurses with a way to develop Loving-Kindness and Equanimity towards themselves and other (Watson, 2008)

Caring should begin the day, take quiet moments throughout the day, and end the day. The nurse should center herself before entering a patient's room, preparing medications, and before any nursing intervention (Watson, 2008). This concept is an important way for nurses to care about patients and preventing errors. Nurses must be authentic, have a deep awareness of self, and have a strong ego and belief system in order to care for someone other than himself or herself. Having a helping-trusting, caring relationship, engaging in teaching-learning experiences with patients, creating a healing environment, and helping with patient needs are all concepts of Watson's caring theory. All of these concepts are essential to having an open, honest, caring relationship with co-workers and patients (Watson, 2008).

Watson (2008) Caritas 4: Developing and Sustaining a Helping-Trusting Caring Relationship. This caritas is related to education of knowledge, skills, and values of health care providers. Some assumptions of a caritas nurse include the moral commitment to society. This assumption is related to do no harm, but to protect. The next assumption of a caritas nurse relates spirituality and being present, and showing caring concern for the

patient in times of despair. The next assumption of a caritas nurse relates to being centered and available, communicating with the patient and family.

Nelms and Treiber (2011) conducted a study to reduce medication administration errors using Watson's caring theory. The purpose of the study was to institute a nursing unit intervention to decrease medication administration errors. These authors consulted Watson and received strategies to decrease distractions and increase concentration during medication administration. Three of Watson's ten caritas processes were consistent with medication administration: (a) practice loving-kindness and equanimity within the context of a caring consciousness, (b) being authentically present, and (c) developing and sustaining a helping trusting, authentic caring relationship. Watson recommended that nurses center themselves before beginning medication administration and before each patient contact. Watson gave the nurses examples of centering, slow, deep breathing, or concentrating on ones' breathing. Another method of centering included the process of hand washing. During the hand washing process, the nurse should clear her mind of the previous patient and concentrate on the next patient activity with authentic presence. Watson states that centering promotes nursing practice conducted with equanimity. Another strategy recommended by Watson involved the nurses wearing a brightly colored sash when administering medications. The sash represented an area of protection around the nurse to prevent distractions. The last caritas strategy related to ongoing use of policies and procedures related to medication administration. Verifying medication orders, concentration, checking the rights of medication administration, verifying allergies, identifying the patient, and correctly administering medications confirm the helping, trusting care of patients and family members. This study concluded that during

the 7-week trial period there were four non-severe wrong dose medication administration errors. Three were not harmful to the patient. One medication administration error was more serious and required more observation of the patient.

Mindfulness is a very old Eastern Buddhist term that is complimentary to Watson's second *caritas*. Mindfulness as defined by Kabat-Zinn (2003) "the awareness that emerges through paying attention on purpose, in the present moment" (p. 144). Watson's *caritas* two is being authentically present and enabling and sustaining the deep belief system of self and one being cared for Watson, (2008). This *caritas* is congruent with Kabat-Zinn, (2014) in that they both believe in being aware of self and others, paying attention or listening, and being available.

In a study by Desbores et al. (2012), it was noted that mindfulness emotional processing might occur during meditation or simply in any state of mind. The suggestion from this study is that mindfulness-meditation may inspire learning. This learning might affect lasting alterations in intellectual functions. Both Desbores et al. (2012) and Kabat-Zinn (2014) believe meditation or mindfulness will aid with learning and centering self. These beliefs are congruent with Watson's *caritas* two which relates to centering self to prevent errors.

Butts (2016) related mindfulness to attention to activities or roles. Mindfulness is essential to nursing for safe, competent care to be implemented for each patient. Nurses should be attentive to detail and to roles of nursing for self and co-workers. If nurses are mindful of self and others, they will be less likely to make medication errors.

The ANA also supports mindfulness for nurses. In a booklet published by the ANA, Bazarko (2014) emphasized nurses must practice mindfulness, care for themselves,

and provide safe patient care. Bazarko identified several activities that promote mindfulness that will decrease stress, improve listening skills, improve health, and help nurses be in the moment when providing patient care.

CHAPTER II

REVIEW OF LITERATURE

The literature review provides guidance for this project in the implementation of educational program in the clinical setting to increase knowledge and promote change among the nursing staff related to medication errors. A literature search was conducted using Cumulative index of Nursing and Allied Health Literature, BioMed Central, Cochrane Database, Google Scholar, Medline, Ovid Nursing Full Text Plus, PubMed, Science Digest, Wiley Online Library, and other Internet evidence-based resources. Key words using these searches included medication errors, adverse drug events, look a-like medications, sound a-like medication, medication statistics, and incidence of medication errors, causes of medication errors, preventing medication errors, new technologies, simulation, and tools to assess medication simulations. A summary of the literature review will address the incidence of medication errors, teaching methods to decrease medication errors, new technologies to decrease the incidence of medication errors, and simulation to provide hands on teaching to decrease medication errors. A review of literature table was developed as a reference (Appendix B).

Medication Errors

The United States reports that medical errors are responsible for 44,000 to 98,000 unnecessary deaths per year (Weingart et al., 2000). Errors occur for many different reasons. Some reasons cited for medication errors include inexperience, fatigue, new, unfamiliar procedures, illegible handwriting, calculation errors, prescribing errors, omissions, overdosing, and simply failing to report medication errors. Approximately 116 million extra health care provider visits per year are related to medication errors.

Prescriptions, emergency department visits, hospital readmissions, and admission to long-term care facilities are all affected by medication errors. Medication errors account for the increased number of emergency department visits, intensive care admissions, and extended length of stay in hospitals (Weingart et al., 2000). The total cost for this type of error is measured by lost income, disability, loss of household productivity, and health care costs. The latest information estimates that 70% of adverse medication events are preventable (Dracup & Bryan-Brown, 2003).

The Institute for Safe Medication Practices (2013) reports 210,648 medication errors in 2012. This is a 16% increase in medication errors from the previous year. The largest increase in medication errors occurred in 2010, with a 31% increase. The ISMP (2013) reported 45,421 deaths from medication errors in 2012. To compare the seriousness of the issue, the ISMP reported in the same year that 6,000 deaths from homicides, while deaths from automobile accidents were 45,421, and deaths from cancer numbered 575,000.

Reporting medication errors are essential to the health and safety of all patients. The FDA is responsible for the safety and effectiveness of all controlled medical products. Medication errors can be reported directly to the FDA. The FDA also provides education to health care providers related to the importance of monitoring for adverse drug events and reporting the errors. The reporting of errors assists the FDA to develop evidence-based information to educate healthcare providers and improve the safety of patients. Look alike and sound alike drugs are responsible for 29% of medication errors. Ten percent of medication errors by nurses are related to a failure to properly identify the drug. Written guidelines, checklists, dose limits, and pre-printed orders are a few of the

interventions that should decrease the number of medication errors (Elnour, Ellahham, & Al Qassas, 2007).

The IOM (1999) reported a rate of 98,000 deaths per year related to medication errors. The IOM promoted learning from errors by establishing reporting programs that were mandatory. The desired outcome was a 50% reduction in medication errors. According to this report, an estimated rate of 190,000 deaths annually due to medication errors. Bogner (2009) identified a “5 whys” technique to determine why a medication error occurred. The thought is that if the why can be identified, the nurse will not commit the error again.

Nurses must first recognize a medication error before the reporting process can begin. Mayo and Duncan (2004) defines a medication error as a deviation from a physician’s order. Mayo suggests that the nurse perception is directly related to the reporting of medication errors. The nurse must recognize an error and be willing to report the error. She also discusses the causes of medication errors. Some of the causes include physician handwriting, distractions during medication administration, fatigue, drug calculation errors, dispensing errors, and administration errors. Her research discusses the self-reporting method of reporting medication errors. Nurses are on the front line of medication errors, and unless observed, the nurse may be the only person aware of the error. She proposes that some nurses do not know what defines a medication error; therefore, they do not know they have committed an error. Other nurses do not report medication errors because of the fear of losing their jobs. This study revealed many different nurse views on reporting medication errors.

Medication administration is a learned skill that consumes the majority of a nurse's time each shift. Because medication administration is such a large part of patient care, every nurse is at risk for committing a medication error. The nurse may be responsible for administering up to 50 different medications per shift, depending on patient load and the acuity of the patients (Rassin et al., 2005).

Medication administration is a multistep procedure that includes prescribing, transcribing, dispensing, and administering medications, and observing patient reactions. Medication errors may occur anytime during this process. Education of nurses can help reduce the incidence of medication errors. There must be continuous education of new drugs, new policies, and new procedures. Preventing medication errors is an ongoing process, and the use of appropriate technology can help ensure proper adherence to procedures (Anderson and Townsend, 2010).

An important intervention to reduce medication errors is continuing education to improve knowledge of medications management and administration. Nurses must have knowledge and skills in order to recognize potential medication errors before they occur (Xu et al., 2014).

The National Priorities Partnership [NPP] (2010), reported that nearly four million patients were exposed to medication errors, with a cost of \$16.4 billion annually. Thirty seven percent of preventable medication errors were a result of dosing errors, and 11% are related to allergies and drug interactions.

Technology

Technologies such as bar-code medication administration, computerized dispensing, and electronic medical records are just a few of the newer technological

measures to decrease the incidence of medication errors (Jones & Treiber, 2012). Bar code replaces the manual identification and documentation of medication administration by using scanned patient identification from patient armbands and scanned information from each medication code, to produce an electronic transmission to a database for verification (Harrington & Clyne, 2013). Electronic order entry and e-mars are also methods of decreasing the number of medication errors within the health care setting.

Medication administration using bar-code technology is one method of potentially decreasing the incidence of medication errors. Bar code is an additional method to aid in identification of the patient and documentation of medication. Patient verification and medication verification are confirmed by electronic scanning. The patient's armband is then scanned to confirm identification. Each medication package is scanned, where a code is transmitted to an electronic database for verification. If the patient identification armband or the medication is in error, the system will alert the nurse to the potential error. The study revealed that nurses were not scanning in the proper sequence. Most nurses scanned the medications first, and then scanned the patient identification armband. This process did not follow current evidence of bar-code medication administration. The conclusions of this study concluded that bar-code medication administration would help decrease the potential for medication errors. Additional study of patient identification armbands, and allergy alerts is recommended (Harrington & Clyne, 2013).

Human patient simulation is state-of-the-art technology that can also influence medication errors by providing a safe venue for nurses to demonstrate competency related to safe medication administration. Human simulation improves acquisition and retention of knowledge. Participants are able to perform nursing skills quicker and more accurately.

Simulation is a very important tool to remediate clinical skills. The participant is given a short realistic scenario on medication administration. The participant is able to perform the skill as many times as is needed to become proficient. The simulation scenario allows the participant to perform nursing skills in a safe environment where no harm can come to a patient. Simulation can be used by all healthcare providers and is an excellent preparation for the clinical setting. There are limitations to simulation use. Some limitations include the cost of setting up a simulation lab, space to set up the simulation lab, and properly trained faculty. Simulation allows novice nurses to learn skills and best practices in a safe setting (Bremner et al., 2006)

Simulation is a unique circumstance where the learning activity can be organized to accomplish detailed learning objectives. Simulation allows the participant to practice a skill in a safe environment where no harm can come to the patient. This allows the nurse to practice a skill and not feel the pressures of the nursing unit while administering medications (Suplee & Solecki, 2010).

A study by Sears, Goldsworthy, and Goodman (2010) revealed that the medication administration practice in a simulated setting could reduce medication errors in the clinical setting. This study compared participants who utilized the simulation event and a control group that did not participate in the simulation. The control group had twenty-four medication errors, while the simulation group had only seven medication errors during medication administration in the clinical setting.

Using simulation to improve medication administration skills is effective in decreasing medication administration errors. A study completed using nursing students revealed a significant reduction in medication administration errors. Simulation

experiences improve the nurses' skills to correctly and safely administer medications. Simulation leads to better bedside care of the patient with decreased risk to the patient (Harris et al., 2014).

Hayden, Smiley, Alexander, Kardong-Edgren, and Jefferies (2014) reported the methods and results of a study to replace clinical hours with simulation. The Creighton Competency Evaluation Instrument, (CCEI) (Appendix A) was used to measure clinical competency. The CCEI instrument consists of 23 items to allow for evaluation of participant competency.

Hayden, Keegan et al. (2014) reported detailed validity and reliability of the Creighton Competency Evaluation Instrument. Content validity ranged from 3.78 to 3.89 on a 4-point Likert-like scale. Cronbach's alpha was $>.90$ when used to score three different levels of simulation. These statistics indicate that the CCEI is a valid and reliable tool to assess competency.

Theory

Nelms and Treiber (2011) conducted a study to determine if medication errors would be reduced by using Watson's caring theory. Watson was consulted to provide guidance with her theory and medication errors. Three of Watson's caritas processes used for this study include: (a) practice loving-kindness and equanimity within the context of a caring consciousness, (b) being authentically present, and (c) Watson recommended developing and sustaining a helping trusting, authentic caring relationship. Watson recommended nurses center themselves before beginning any patient care. She also recommended the use of brightly colored sashes to let other staff know not to distract the nurse when she is administering medications. The next recommendation involved

incorporation of principles related to medication administration. These practices uphold the helping, trusting care of patients and family.

Doctor of Nursing Practice Essentials

The Essentials of Doctoral Education for advanced practice nursing (AACN, 2006) (Appendix C) will be demonstrated and integrated into the DNP Capstone Project. The use of testing, education, simulation, and follow up of retesting will provide improved patient outcomes. This capstone project is based on evidence-based knowledge, organization, and systems leadership, clinical scholarship for evidence-based practice to improved outcomes and decrease cost to facility. Creating a pre-test, lecture information, simulation experience, and a post-test provides a scientific approach to improving and evaluating quality health care. The project will provide the needed leadership and skills to transform health education, communication, and use of technology to assist the nurses at Pearl River County Hospital.

The ANA (2015) promotes professionalism and a culture of safety. Provision three states that nurses have a duty to contribute to the development, implementation, and review of policies that enhances patient health and safety and decrease errors or near misses. This provision also states nurses are responsible to disclose an error or near miss by them or others. Nurses also need to look at the errors and near misses to determine if there was something the nurse could have done to prevent the error or near miss. The ANA also believes that nurses should be held accountable for their practice, and that errors should be corrected. Remediation and disciplinary actions should be taken only if justified. Communication is one of the most important aspects of safety. Communication

should start at the level the error or near miss occurs. The facility chain of command must be adhered to in every case.

Objectives

The goal of this doctoral capstone project is to promote an atmosphere within Pearl River County Hospital that will increase competencies for the nurses and decrease the incidence of medication errors. Instituting the just culture model to avoid causing risk and harm, the duty to produce an outcome, and the duty to follow procedural rules will have a profound effect on reducing medication errors. This project is designed to provide evidence-based information to increase the competencies of healthcare providers and ultimately decrease the incidence of medication errors, and improve patient safety.

Table 1

Project Objectives

Project Objectives	Evaluation Outcomes
1. Increase the knowledge and Competencies of nurses.	Initial knowledge and competencies are measures using a pre-test, presentation, a simulation, and a post-test to follow two weeks later.
2. Encourage communication in addition, improve relationships among the nurses.	The nurse will learn communication skills and become confident when communicating with other nurses, patients, and doctors.

Table 1 (continued).

Project Objective	Evaluation Outcomes
3. Decrease the incidence of medication errors.	The nurse will gain knowledge of medication administration and competency in medication administration, that will result in decreased incidence of medication errors.

CHAPTER III

METHODOLOGY

The purpose of the DNP capstone project was to decrease the incidence of medication errors by increasing the competency of nurses. Inclusion criteria for participation in the project required the nurse be employed at Pearl River County Hospital and assigned to medication administration. There were no age limits for participation. At the completion of the interventions, the quantitative data were analyzed to determine if the goal of increased competencies and decreased incidence of medication errors was achieved. The just culture model was a guide for the project to assure the nurses that no finger pointing or blame was permitted. The hope of this culture was that the nurses would openly participate without fear of reprimand. Following approval from the Institutional Review Board (IRB) at The University of Southern Mississippi, this project was implemented (Appendix D). A letter of approval to implement this capstone project was obtained from Pearl River County Hospital (Appendix E) The information obtained during this project did not contain sensitive information, nor did it involve hidden video or audio recordings, or any deception on the part of this DNP student. This reviewer maintained confidentiality at all times. Upon completion of the project and data analysis, all data were shredded. There were no incentives to participate in the project.

Setting

The setting for this capstone project was a small rural-acute care hospital located in south Mississippi. This health care facility is a 24-bed acute care hospital. Registered nurses and Licensed Practical nurses were employed at the facility. This capstone project

included four registered nurses and six licensed practical nurses. All nurses participating in this project administered medications.

Description of Project

The project intervention consisted of four phases. The first phase was an introduction, a description of the project, a description of the short IRB consent form, signing of the IRB consent form, and administration of the pre-test. Following the signing of consent forms, basic demographic information was obtained. The pre-test consisted of 12 short fill in the blank, true/false, or multiple choice questions related to medication administration (Appendix G).

Phase 2 was a brief presentation of information related to basic medication administration and common errors. In this information session, the rights of medication administration were reviewed. Types of medication errors were explained, and time was provided to allow the nurses to relate their own medication errors and explain why they believe the error occurred.

Phase 3 consisted of a simulated medication administration exercise using a 3-G simulation mannequin (Appendix H). None of the participants had any previous experience with simulation. The simulation exercise was a basic medication administration exercise. The nurse was provided a history and physical for the patient. Health care provider orders were available. The nurse completed an electronic chart check to verify patient medications, doses, routes, and frequencies. The nurse entered the patient room and was expected to wash hands, identify the patient, verify the medications, and safely administer all medications. The nurse then documented the medication administration during the simulation exercise in the simulated electronic health record in

the Education Department. The Creighton Competency Evaluation Instrument (Appendix A) was used to assess the simulation exercise. The Creighton Competency Evaluation Instrument is a 23-item evaluation instrument used to evaluate performance in a simulated scenario. The evaluation items are divided into categories of assessment, communication, clinical judgement, and patient safety. Written permission to use the Creighton Competency Evaluation Instrument was obtained from Martha Todd, Creighton University College of Nursing (Appendix I). Upon completion of the medication administration exercise, a debriefing session was conducted with each nurse completing the simulation. Debriefing was a major part of simulation where the participants learned from their mistakes.

The fourth and final phase consists of returning two weeks later to administer the post-test (Appendix J). The post-test is identical to the pre-test. The two week period will allow for determination of knowledge retention.

This capstone project was conducted at Pearl River County Hospital in cooperation with the education department. The tools developed in this capstone project will continue to be utilized by the education department when orienting new employees. These tools and information will provide evidence-based resources for implementing a yearly competency of all nurses. This capstone project may also be used to present information through presentations to groups of nurses, as well as a guide for nurses who are making frequent medication errors.

Purpose

The goal of this capstone project was to determine whether simulation and educational strategies would increase competency levels of English speaking Licensed Practical Nurses and Registered Nurses who administer medications. Secondary objectives were to decrease medication errors. This capstone project is a guide for interventions to increase patient outcomes and decrease length of stay in hospitals.

Description of Study

The project leader consulted with Steve Colson, RN, Director, of Office of Staff Development and community Outreach at Pearl River County Hospital to determine a need for medication error education. Colson recommended the presentation of this education at a mandatory in-service for all nurses. An in-service was conducted on March 5, 2015 at 6:30 am in the Education Department at Pearl River County Hospital. A repeat in-service was conducted on the same day at 6:30 pm to connect with the 7pm to 7 am nurses.

The project leader provided nurses with information related to this capstone project at Pearl River County Hospital. The in-service provided the nurses with information to increase their competency in medication administration.

The project leader explained the consent forms and nurses signed an agreement to participate. Pearl River County Hospital assured the nurses that the in-service is voluntary, and there will be no punitive measures taken if a nurse declines participation. This participation is congruent with the just culture theory and the ANA, in that both believe nurses are accountable for their actions, but should not be punished if errors are unintentional. Remediation and correction of errors are more important to prevention.

To determine baseline competency for medication administration a pre-test was administered. A didactic lecture was presented on medication administration, common medication errors, and methods to decrease these errors. The lecture included the rights of medication administration, preparing medications, medication calculations, electronic medication records with e-mars and scanners, and examples of common medication errors. Each nurse performed a follow up medication simulation. The Creighton Competency scale was utilized to evaluate each nurse. Each simulation received a score, with 23 being a perfect score. Each nurse participated in debriefing to discuss any medication errors and to provide positive reinforcement of competencies.

Two weeks after the lecture presentation the project leader returned to the health care facility. A post-test was administered to the nurse who had participated. The goal of this exercise is to determine retention of information and competency of each nurse administering medication.

Procedure

Data Collection

No identifying information was recorded on the data collection tools. The demographic form (Appendix F), the pre-test (Appendix G), the Creighton Competency Evaluation Instrument (Appendix A), and the post-test (Appendix J) were numbered 1 through 10. Each participant received data collection tools with a specific number on each set of tools. A sign in sheet was used to ascertain each participant received the same number on each tool. Confidentiality was maintained by use of the numbers on each tool. The participant was assured the sign in sheet would be destroyed.

After all information was collected on the data collection tools, the results were entered into an excel spreadsheet. Codes were used to identify each variable. The quantitative data were analyzed to determine if the goal of increased competency of nurses administering medications was met. The potential benefits of this project are to increase competencies of nurses, which will decrease the incidence of medication errors. The long range goal of this project is to improve patient outcomes.

CHAPTER IV
ANALYSIS OF DATA

The purpose of this capstone project was to increase competencies of nurses who administer medications and to decrease the incidence of medication errors. Ten (N=10) nurses who administer medications participated in this capstone project. The data collected on the pre and post tests, and the simulation was used to determine if competencies of nurses administering medications improved following implementation of presenting information and participating in the simulation scenario.

Demographics of the Sample

The demographic analysis revealed that all ten participants were nurses who administer medications. The participants were all females who had between eight months and twenty-seven years work experience, with the median years experience being 14.5 years. There were four registered nurses and six licensed practical nurses.

Table 2

Demographic Data

Variables	Frequency	Percent
RN	4	40%
LPN	6	60%
Years of Experience		
8 months	1	10%
4.5 years	1	10%
5 years	1	10%

Table 2 (continued).

Variables	Frequency	Percent
7 years	1	10%
10 years	1	10%
12 years	1	10%
16 years	1	10%
19 years	1	10%
27 years	1	10%
44 years	1	10%
Total	10	100%
Years at PRCH		
2 weeks	1	10%
8 months	1	10%
3 years	1	10%
3.5 years	1	10%
4 years	1	10%
4.5 years	1	10%
7 years	1	10%
8 years	2	20%
15 years	1	10%
Total	10	100%

Note: N=10; RN=Registered Nurse; LPN= Licensed Practical Nurse; PRCH= Pearl River County Hospital.

Analysis of Data

Pre-test results of the data revealed a mean score of 78.10% with a standard deviation of 9.351. The median score of the pre-test was 78.1%. Scores ranged from 64 to 91%. Forty percent of the participants scored 80% or greater.

Table 3

Pre-test scores

Variable	Frequency	Percent
Scores		
64%	1	10%
69%	1	10%
73%	3	30%
78	1	10%
82	1	10%
87	1	10%
91	2	20%
Total	10	100%

The Creighton Competency Evaluation Instrument had a potential score of twenty-three points. The data revealed that one participant scored a perfect twenty-three points. Thirty percent of the participants scored less than 20 points, with 70% of participants scoring greater than 20 points.

Table 4

Creighton Competency Evaluation Instrument (CCEI)

Variables	Frequency	Percent
CCEI Scores		
17	1	10%
19	2	20%
20	1	10
Variables	Frequency	Percent
CCEI Scores		
21	1	10%
22	4	40%
23	1	10%
Total	10	100%

Post-test results of data from two weeks later revealed that six participants scored 100%, while four participants scored 96%. A *t*-Test was performed to analyze the pre-test, post-test data. Results were; $t(9) = 7.268, p < 0.001$. There is a statistically significant difference between the pre-test and post-test. The post-test revealed higher scores.

Table 5

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 PreTest Pre-Test	78.10	10	9.351	2.957
PostTest Post-Test	98.40	10	2.066	.653

Paired Samples Correlations

Pair 1 PreTest Pre-Test & PostTest Post-Test	N	Correlation	Sig
	10	.354	.315

Paired Samples Test

Paired Differences						
Pair 1 Pre-Test Pre-Test PostTest PostTest	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
	-20.30	8.832	2.793	-7.268	9	.000

Evaluation Plan

The purpose of this capstone intervention was to increase competencies of nurses who administer medications. The pre-test (Appendix G) was used as baseline data to determine current competency of nurses administering medications. Medication administration information and a simulated medication administration scenario (Appendix

H) were utilized to increase knowledge of medication administration. Two weeks following the presentation of information, a post-test (Appendix J) was administered to the participants. The post-test was administered to determine retention of knowledge as a means of evaluating increased competencies. All participants had a significant increase from pre-test to post-test, indicating increased competency.

CHAPTER V

SUMMARY

Medication errors have become an epidemic, not just in the United States, but also all over the world. The IOM has issued several mandates for health care providers to decrease the incidence of medication errors. Joint Commission has developed many new guidelines to help health care providers prevent medication errors. The ISMP has developed guidelines and protocols for health care providers to prevent medication errors. All of these governing bodies are constantly working to prevent medication errors. Because there is such a stigma related to medication errors, these governing bodies are attempting to convince nurses to report medications is an attempt to determine the causes of medication errors. The long term goals are to find solutions to the reasons for medication errors.

Health Research and Educational Trust [HRET] (2012), recommends healthcare facilities understand that medication errors may be due to systems failures. HRET also agrees that the culture of blame has done nothing to decrease medication errors. HRET advocates for a just culture. By using the just culture model, a nurse may learn from their mistakes and improve competencies, thereby decreasing medication errors.

This capstone project results indicate that nurses do increase competencies when information and a simulation scenario are presented to nurses who administer medications. A pre-test aids with determining what information needs to be presented. A simulation allows for evaluation of each nurse on an individual basis. The debriefing sessions allow for feedback and correction of any discrepancies. A post-test in two to three weeks aids with determining retention of information. This presenter would recommend early

competency evaluations using the pre-test, information presentation, simulation, and follow up post-test.

Limitations. Some limitations of this capstone project included a small sample size. There were 10 nurses who administer medications. The site for this capstone project was a small rural healthcare facility. At the time of this capstone project this health care facility had some employee layoffs and some reduction in the number of hours each nurse worked in a week. All of these issues contributed to the small sample size. Another limitation of this capstone project was time constraints. A follow up medication administration simulation could have provided additional information related to competencies of the nurses. Future plans should include a follow up simulation with an in depth debriefing.

Framework. Using the just culture model to avoid adverse consequences for medication errors that were unintentional should help with reporting of medication errors. The plan of this model is to help nurses feel they can report medication errors and therefore help find solutions to the errors. All of this will help decrease the incidence of medication errors and increase competencies of nurses who administer medications. This capstone project did not totally increase competencies, or stop medication errors. The evaluation plan provides evidence that this is a never-ending concern. Medication errors must be addressed at least on a yearly basis to maintain competencies. Evidence-based materials must be introduced to nurses. This concern is a constant concern for quality improvement issue that will improve patient outcomes.

Implication for Practice. The implications for the future include improved communications between nurses and patients. Communication related to medication

administration is an important component related to preventing medication errors. Medication errors are one of the most costly issues in health care. Communication among nurses and patients could improve patient outcomes. Yearly competency evaluations will provide nurses with the most current evidence-based information related to medication errors. Yearly competency evaluations will also provide the nurses with an opportunity to discuss medication errors and the reasons they occur. This DNP Capstone Project will be utilized as a yearly competency model for Pearl River County Hospital. It is recommended that a follow-up simulation exercise be conducted as part of the yearly competency.

Recommendations for future research. Medication error prevention will need to be an ongoing research project for the DNP prepared nurse. This research will lead to new evidence-based guidelines to increase nurse competencies and prevent medication errors. A DNP prepared nurse will be needed to set up an adequate reporting and record keeping system related to medication errors and reasons for each occurrence. The DNP prepared nurse has the knowledge and skills to assist health care facilities to prevent medication errors, increase competencies of nurses, and improve patient outcomes.

Conclusion. This capstone project provides evidence that providing an information, and simulation scenario does improve the competencies of nurses who administer medications. The pre-test provides a baseline of information. The post-test evaluates retention of information. Implementation of evidence-based information on a yearly and as needed basis will provide nurses with the information to improve competencies and improve patient outcomes. The DNP prepared nurse will implement and evaluate evidence-based improvements to improve patient outcomes. By improving

patient outcomes costs, the nurse will be directly associate decreasing costs on the health care system.

APPENDIX A

CREIGHTON COMPETENCY EVALUATION INSTRUMENT



Creighton Competency Evaluation Instrument (C-CEI)

College of Nursing

Student(s) Name:		Date: ____/____/____
Scenario:		
Evaluator:		
ASSESSMENT	0 = Does not demonstrate competency 1 = Demonstrates competency NA = Not applicable <small>Circle Appropriate Score for all Applicable Criteria If not applicable, circle NA</small>	COMMENTS:
1. Obtains Pertinent Data	0 1 NA	
2. Performs Follow-Up Assessments as Needed	0 1 NA	
3. Assesses the Environment in an Orderly Manner	0 1 NA	Todd et al., 2008
COMMUNICATION		
4. Communicates Effectively with Intra/Interprofessional Team (TeamSTEPPS, SBAR, Written Read Back Order)	0 1 NA	
5. Communicates Effectively with Patient and Significant Other (verbal, nonverbal, teaching)	0 1 NA	
6. Documents Clearly, Concisely, & Accurately	0 1 NA	
7. Responds to Abnormal Findings Appropriately	0 1 NA	
8. Promotes Professionalism	0 1 NA	
CLINICAL JUDGMENT		
9. Interprets Vital Signs (T, P, R, BP, Pain)	0 1 NA	
10. Interprets Lab Results	0 1 NA	
11. Interprets Subjective/Objective Data (recognizes relevant from irrelevant data)	0 1 NA	
12. Prioritizes Appropriately	0 1 NA	
13. Performs Evidence Based Interventions	0 1 NA	
14. Provides Evidence Based Rationale for Interventions	0 1 NA	
15. Evaluates Evidence Based Interventions and Outcomes	0 1 NA	
16. Reflects on Clinical Experience	0 1 NA	
17. Delegates Appropriately	0 1 NA	
PATIENT SAFETY		
18. Uses Patient Identifiers	0 1 NA	
19. Utilizes Standardized Practices and Precautions Including Hand Washing	0 1 NA	
20. Administers Medications Safely	0 1 NA	
21. Manages Technology and Equipment	0 1 NA	
22. Performs Procedures Correctly	0 1 NA	
23. Reflects on Potential Hazards and Errors	0 1 NA	
COMMENTS		
Total: _____		
Total Applicable Items: _____		

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For more information, please contact Martha Todd, MS, APRN @ mtodd@creighton.edu

Revised 4/22/2014

APPENDIX B

LITERATURE REVIEW

Authors Date	Study Type	Sample	Data	Key Findings
American Association of Colleges of Nursing (2006)	Position Statement	N/A	N/A	DNP Essentials
Anderson & Townsend (2010)	Learning	N/A	Literature review	Statistics; communication, drug packaging, storage, to decrease medication errors.
Bazarko (2014)	Information	N/A	N/A	ANA Information Booklet discussing Mindfulness and nurses, preventing errors.
Bogner (2009)	Report	None	Information	To Err is Human, ten years later. Looking at reducing medication errors.

Authors Date	Study Type	Sample	Data	Key Findings
Bremner et al. (2006)	Qualitative	56 novice nursing students	Questionnaire	Ninety five percent of students rate the session from good to excellent, gave confidence.
Butts (2016)	Book	N/A	N/A	Mindfulness and nurses.
Desbores et al. (2012)	Literature review	Multiple studies	Different numbers for each study	Looking at the effects of meditation and mindfulness.
		and internal units	observational data	are those that represent the whole cycle of team learning.
Elnour et al. (2007)	Quantitative (Descriptive)	Teaching hospital, nurses, pharmacist	Medication Safety program	Multidisciplinary approach to solve medication errors.
Harrington & Clyne, (2013)	Gap Analysis	Healthcare providers	Evidence	Current evidence is not always applied, checklist helped identify gaps
Harris et al. (2014)	Quasi-experimental pilot study	158 junior level nursing students	Medication administration exam	The students who were in the simulation group mastered.

Authors Date	Study Type	Sample	Data	Key Findings
Hayden, Smiley et al. (2014)	Study	10 prelicensure nursing programs, 666 students	Longitudinal, randomized, controlled study, descriptive statistics	Substituting high-quality simulation experiences for up to half of traditional clinical hours produces comparable outcomes.
Jones & Treiber (2010)	Questionnaire, qualitative and quantitative	2472 nurses, Georgia	Questionnaire, rate 11 factors related to medication errors	202 nurses responded. Items rated highest to lowest in factor.
Jones & Treiber (2012)	Systematic review	Multiple studies with nurses from various areas of practice	Survey	RN average 18.7 years experience. Report making 2-5 medication errors.
Sears et al. (2010)	Experimental study	54 nursing students/2 groups	Random experiment	Better outcomes with simulations.

APPENDIX C

DNP ESSENTIALS

Essentials	DNP Capstone
Scientific underpinning for practice	The project broadens the discipline of nursing by promoting an understanding of how to change practice behavior for nurses to improve the total good of a particular population.
Organizational & system leadership for quality improvement system thinking	The project extends and assesses new approaches for medication administration that will help manage present and potential desires for defined populations.
Clinical scholarship and analytical methods for evidence-based practice	The project provides the occasion to critically evaluate literature to support implementing evidence-based patient-centered care tactics for improvement in health care outcomes.
Information systems/technology for the improvement and transformation of health care	The project promotes the DNP graduate to design and implement programs linked to new technology for improving appropriate and easier access to healthcare services.
Healthcare policy for advocacy in health care	The project involves the DNP graduate in committees, boards, and interdisciplinary team groups at the local, state, and national level as an expert in policy issues related to medication administration.

Clinical prevention and population health
for improving the nation's health

The project enhances the DNP graduate
role in improving medication
administration, management, and
reducing potential for adverse outcomes
based on populations in rural hospitals.

Advanced nursing practice

The project allows the advancement of
nursing practice by promoting the DNP
graduate as a mentor for other healthcare
professionals in the safe administration of
medications.

APPENDIX D

INSTITUTIONAL REVIEW BOARD NOTICE OF COMMITTEE ACTION



THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15022502

PROJECT TITLE: Simulation and Educational Strategies to Decrease the Incidence of Medication Errors in a Small Rural Acute Care Hospital

PROJECT TYPE: New Project

RESEARCHER(S): Queen Victoria Walters

COLLEGE/DIVISION: College of Nursing

DEPARTMENT: Systems Leadership and Health Outcomes

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

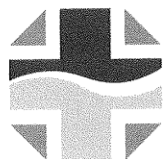
PERIOD OF APPROVAL: 02/25/2015 to 02/24/2016

Lawrence A. Hosman, Ph.D.

Institutional Review Board

APPENDIX E

LETTER OF PERMISSION

**PEARL RIVER COUNTY
HOSPITAL & NURSING HOME**

December 15, 2014

The University of Southern Mississippi
Graduate School for the Degree of Doctor of Nursing Practice
Hattiesburg, MS

To Whom It May Concern:

I have reviewed Queen Walters' proposal to carry out a research project at Pearl River County Hospital and Nursing Home. I understand that Queen is conducting this project as part of the requirements for the Doctorate of Nursing Practice program at the University of Southern Mississippi and will have the opportunity to present the research findings in other venues.

I understand that the Institute Review Board for the use of human subjects in Research (IRB) at USM is concerned with protecting the confidentiality, privacy, and well-being of research participants. Further, it is my understanding that Queen will additionally be advised on this project by her academic advisor and the USM field liaison, both of whom will have regular contact with Queen.

Queen is fully aware of the Health Insurance Portability and Accountability Act (HIPAA) and the policies and procedures of PRCHNH. I do not have any reservations or concerns about the research study to be performed by Queen based on the proposal, and conversations we have had and her knowledge of PRCHNH.

PRCHNH supports Queen Walters' plan and approves of the project, including recruitment of participants and data collection through the PRCHNH clinic.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Colson", written in a cursive style.

Steve Colson RN, Director
Office of Staff Development & Community Outreach

APPENDIX F

DEMOGRAPHIC INFORMATION FOR MEDICATION ADMINISTRATION

Name	
Gender	
Highest Nursing Degree Completed	
Length of Employment at Pearl River County Hospital	
Years of Nursing Experience	

APPENDIX G

PRE-TEST

1. List the 7 rights of medication administration:
 - A. _____
 - B. _____
 - C. _____
 - D. _____
 - E. _____
 - F. _____
 - G. _____

2. List 2 patient identifiers for medication administration:
 - A. _____
 - B. _____

3. Nursing staff authorized to administer medications should only perform which of these medication administration duties?
 - A. Give any medication requested by the physician
 - B. Give any medication requested by the patient
 - C. Perform any medication you have been trained to perform and is in your scope of practice.
 - D. Delegate application of a topical antibiotic to an unlicensed person

4. Systemic medications:
 - A. Effect a single organ or tissue
 - B. Effect the whole body
 - C. Are only found in ointment form
 - D. Are only found in oral medications

5. Your patient complains of a headache. You should:
 - A. Give the aspirin your patient has ordered for fever $> 101^0$
 - B. Ask the patient to describe the headache, then call the physician for an order
 - C. Give Motrin even if there is no order because Motrin will help the headache
 - D. Ignore the patient because they are just looking for attention.

6. An adverse drug reaction is different from a medication side effect in that:
 - A. An adverse effect has a greater possibility of causing harm
 - B. An adverse effect always happens, a side effect rarely happens
 - C. Adverse events only occur with injections

- D. There is no difference between adverse events and side effects
7. One ounce equals approximately _____ mL.
- A. 15
 - B. 30
 - C. 50
 - D. 100
8. You should document each patient's medication that are administered
- A. Before administering them
 - B. At the end of your shift
 - C. As soon as possible
 - D. Immediately after giving
9. If a confused patient says, "those are not my medicines". What should the nurse do?
- A. Tell the patient, these are your medicines.
 - B. Ask the patient if she is going to take the medicine
 - C. Notify the physician
 - D. Tell the patient that you will verify that these are her medicines
10. The length of time to administer medications can still be considered to have been given on time is:
- A. 1 to 1^{1/2} hours before the scheduled time
 - B. 1 hour after the scheduled time
 - C. 1/2 hour before and 1/2 hour after the scheduled time
 - D. All medications must be administered within five minutes of the scheduled time.
11. If a medication is accidentally omitted, is this a medication error?
- A. True
 - B. False
12. List the standard precautions a nurse should follow when administering medications.

APPENDIX H
SIMULATION INFORMATION

PATIENT INFORMATION	
NAME	JOHN SMITH
GENDER	MALE
AGE	65
PAST MEDICAL HISTORY	Smoker, drinks occasionally, Type II diabetes, hypertension, coronary artery disease. Allergies: Penicillin, rash, Doxycycline, rash, itching, hives
SOCIAL HISTORY	Married, lives at home with wife, 4 adult children.
CURRENT MEDICAL HISTORY	Presented to the Emergency room at 6 AM today c/o sob, nausea, vomiting, irregular heart rate, muscle weakness. States, he has no appetite and has been sleeping in the recliner for 2 nights.
MEDICATIONS	Coumadin 2.5 mg by mouth every Monday, Wednesday, Friday, Sunday Coumadin 5 mg by mouth every Tuesday, Thursday, Saturday Metformin 850 mg by mouth every AM Lisinopril 20 mg by mouth every AM Hydrochlorothiazide 25 mg by mouth every AM Lasix 20 mg by mouth every AM Sliding scale insulin AC and HS, Regular insulin, Blood sugar-100/20= dose, Do not give less than 5 units
CRITICAL BEHAVIORS	Assessment, including VS, Lab, Medication compatibility Communicates with patient, family, and other health care providers, Professional behavior and Documentation 2 patient identifiers for all medications, Standard precautions, Handwashing, and Gloves as needed, Five rights, Dosage calculation, Concentration and rate,

APPENDIX I

LETTER OF PERMISSION TO USE CCEI

From: Todd, Martha <MARTHATODD@creighton.edu>
Sent: Tuesday, September 02, 2014 1:26 PM
To: Queen Walters
Cc: Todd, Martha
Subject: RE: Creighton Competency Evaluation Instrument

Hi Queen,
You have our permission to use the instrument. Please feel free to call or e-mail me if you have any questions about the instrument use. Good luck on your project.
Martha

Martha Todd, PhD, APRN-NP
Asst. Professor
Creighton University
College of Nursing
402-280-2044
mtodd@creighton.edu



From: Queen Walters [<mailto:qwalters@prcc.edu>]
Sent: Tuesday, September 02, 2014 1:21 PM
To: Todd, Martha
Subject: Creighton Competency Evaluation Instrument

M. Todd,
I am currently enrolled in a doctoral nursing program at The University of Southern Mississippi. I have reviewed the Creighton Instrument and completed all of the modules for use. I am requesting permission to use this instrument for my capstone project. My project is looking at medication errors, providing a teaching, followed by a medication administration simulation.

Queen Walters MSN, RN

APPENDIX J

POST TEST

1. List the 7 rights of medication administration:

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____

2. List 2 patient identifiers for medication administration:

- A. _____
- B. _____

3. Nursing staff authorized to administer medications should only perform which of these medication administration duties?

- A. Give any medication requested by the physician
- B. . Give any medication requested by the patient
- C. Perform any medication you have been trained to perform and is in your scope of practice.
- D. Delegate application of a topical antibiotic to an unlicensed person

1. Systemic medications:

- A. Effect a single organ or tissue
- B. Effect the whole body
- C. Are only found in ointment form
- D. Are only found in oral medications

2. Your patient complains of a headache. You should:

- A. Give the aspirin your patient has ordered for fever $> 101^0$
- B. Ask the patient to describe the headache, then call the physician for an order
- C. Give Motrin even if there is no order because Motrin will help the headache
- D. Ignore the patient because they are just looking for attention.

3. An adverse drug reaction is different from a medication side effect in that:

- A. An adverse effect has a greater possibility of causing harm
 - B. An adverse effect always happens, a side effect rarely happens
 - C. Adverse events only occur with injections
 - D. There is no difference between adverse events and side effects
4. One ounce equals approximately _____ mL.
- A. 15
 - B. 30
 - C. 50
 - D. 100
5. You should document each patient's medication that are administered
- A. Before administering them
 - B. At the end of your shift
 - C. As soon as possible
 - D. Immediately after giving
6. If a confused patient says, "those are not my medicines". What should the nurse do?
- A. Tell the patient, these are your medicines.
 - B. Ask the patient if she is going to take the medicine
 - C. Notify the physician
 - D. Tell the patient that you will verify that these are her medicines
7. The length of time to administer medications can still be considered to have been given on time is:
- A. 1 to 1^{1/2} hours before the scheduled time
 - B. 1 hour after the scheduled time
 - C. 1/2 hour before and 1/2 hour after the scheduled time
 - D. All medications must be administered within five minutes of the scheduled time.
8. If a medication is accidentally omitted, is this a medication error?
- A. True
 - B. False
9. List the standard precautions a nurse should follow when administering medications.

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