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Medication Safety: Improving Faculty Knowledge and Confidence

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Medication Safety: Improving Faculty Knowledge and Confidence

by

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A capstone project submitted to the faculty of
Gardner-Webb University School of Nursing
in partial fulfillment of the requirements for the degree of
Doctorate of Nursing Practice

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2013

Submitted by:

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Approval Page

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Abstract

The purpose of this capstone project was to increase knowledge and confidence among nursing faculty assisting pre-licensure nursing students with the medication administration process. The project administrator designed a one day Safe Medication Practices seminar that included a Medication Administration Toolkit to increase knowledge and confidence in faculty members about safety and efficiency in giving medications with multiple students on any clinical day. This toolkit included high-fidelity simulation medication scenario case examples as a teaching pedagogy, as well as other teaching strategies to utilize in the clinical environment. Bandura's Social Learning theory provided the framework for this capstone project. The Safe Medication Practices Seminar and Toolkit project provided role modeling behaviors as a strategy to share knowledge in order to orient clinical nursing faculty. The capstone project included a pre-post survey descriptive design. Data were collected using project administrator developed surveys to assess knowledge and confidence among nursing faculty before and after attending a safe medication practice seminar and access to a medication administration toolkit. The results showed that there were significant differences between pre-survey and post-survey knowledge and confidence among nursing faculty attending the seminar and utilization of the toolkit. Eighty percent of the faculty rated knowledge and confidence as improved after attending the seminar. At the end of the seminar faculty also felt fewer students should administer medications on a clinical day.

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CHAPTER I

Introduction

Nursing faculty are concerned about the safety of patients while working with several nursing students simultaneously administering medications to complex patients who have many chronic health care issues at the same time. The increased acuity level of patients and the implementation of technology to improve patient safety with medication administration challenges even the expert nursing faculty member. Nursing faculty members are aware that medication administration is more than just a psychomotor or mathematical skill. The faculty member must mentor and coach a student to make sound clinical decisions with medication administration, as well as communicate with the interdisciplinary team and family members about medications to be administered. In addition, he or she must administer these medications with multiple students in an environment where distractions can increase the rate of medication errors and where many health care institutions are implementing electronic medication administration records, as well as bar code scanning of all medications.

The process of educating nursing students about medication safety is multifaceted, and involves teaching not only safe dose ranges, but the clinical judgment and clinical reasoning required to deal with medication side effects, as well as the many other safety steps or rights of medication administration involved with patient care. The increasing technology at the bedside requires nursing faculty to be more efficient and creative in order to allow pre-licensure students medication administration experiences. Nursing faculty members need a mechanism such as a Safe Medication Practices (SMP) seminar and Medication Administration Toolkit (MAT) that will provide a succinct place

to refer to in order to assist students with this process.

Medication errors are occurring at an alarming rate in the United States, and it is estimated that a hospitalized patient can expect to have one medication error occur per day (Aspden, 2007). The National Priorities Partnership (2010) examined the impact of care coordination strategies, interdisciplinary teamwork, and computer technologies such as bar code scanner devices to reduce medication errors. Durham and Alden (2008) discuss medication administration as a vital aspect of nursing practice and a critical component of nursing education curriculum. These facts suggest that faculty need the latest evidence practice guidelines to assist students with the medication administration process. Nursing faculty members need access to information related to technology dealing with safe medication practices. However, with the number of students in some clinical groups, faculty must also be proficient in allowing students to give medications. There are many obstacles for nursing faculty involved with clinical education, and these include the complexity of the patient care environment, electronic medication records, and bar code medication administration scanners that make giving medications with numerous students cumbersome and create potential safety issues. The seminar and toolkit provided in this capstone project will educate or refresh the knowledge of faculty on how to give medications safely and effectively with multiple students in an expeditious manner.

Problem Statement

The purpose of this capstone project, Medication Safety: Improving Faculty Knowledge and Confidence, was to increase nursing faculty knowledge of medication practices and confidence with assisting nursing students with realistic medication pass

opportunities while maintaining patient safety. This is important because the Institute for Safe Medication Practices (ISMP) (2007) issued a safety alert regarding student nurses' involvement in medication errors. The ISMP analyzed medication errors occurring among nursing students in the practice setting. These safety alerts call for clear communication between nurses and the nursing faculty member. The major problem cited in this alert was duality or when a student nurse and staff nurse are participating in the care of a patient assignment at the same time. Nursing faculty must collaborate with primary nurses about patient care assignments and possess a clear understanding of safe medication practices to prevent medication errors. Nursing faculty members who are inefficient or lack the knowledge about how to handle multiple students giving medications can result in unclear communication between the nursing faculty and the primary nurse, and can lead to medication administration errors.

Interestingly, the ISMP identified insulin as the most common medication error for nursing students. They also discussed the conditions that promote student-nurse related medication errors: (a) nonstandard times, (b) documentation issues, (c) medication administration record unavailable or not referenced, (d) partial drug administration, (e) held or discontinued medications, (f) monitoring issues, (g) non-specific doses dispensed, (h) oral liquids in parenteral solutions, and (i) preparing medications for multiple patients. All of these can be issues for faculty working with multiple students on any clinical day. The ISMP offers interventions for nursing faculty to prevent student-nurse medication errors including those that can occur with Bar Code Medication Administration (BCMA) technology.

Justification

The need for communication is paramount among agency staff and nursing faculty. Pape (2007) suggested that nursing faculty teach the importance of reducing distractions and avoiding conversations during medication administration as a strategy to improve safety. Based on these findings, the nursing faculty member should stress the importance of distraction-free areas and be free of interruptions during the medication administration process. Quiet zones also can facilitate the safe medication administration and can provide the nursing faculty member with more confidence to assist with this process. The video (DVD) contained in the MAT depicts an expert faculty member administering medications with students and includes the use of the SBAR (Situation, Background, Assessment, Recommendation) communication strategy. The National Research Council (2007) cited the lack of continuing nursing education specifically on medication errors and the narrow focus on medication patient safety within nursing education programs. The SMP seminar and MAT provides a means for nursing faculty to review evidence based practice, and this information will be organized to enhance knowledge and confidence with medication administration.

Finkelman and Kenner (2009) discussed nursing curriculum and medication errors, and advised faculty members to assure that nursing students receive information about errors, adverse events, root cause analysis, near misses, and medication administration errors. They described the importance of nursing faculty asking questions about medication administration recommended by the Institute of Medicine (IOM): What is an error? What are the types of errors? How frequently do errors occur? What factors contribute to errors? What is the cost of errors? and Are public perceptions of

safety in health care consistent with the evidence? Nurse faculty members may not have access to this information, and a MAT and SMP seminar could be a means to provide access to current evidence based practice to clinical faculty members.

Medication errors are occurring with the use of the Bar Code Medication Administration (BCMA) technology and nursing faculty members need evidence based information to remain up to date with changes involving this type of technology. The project administrator provided information in the toolkit to address BCMA technology. Nursing faculty members could utilize this information to create case studies and clinical conferences to facilitate learning in the clinical care environment. The Joint Commission includes one of its major safety goals as medication administration and the communication of medication administration among the health care team, as well as including the patient and family (Cousins & Heath, 2008). Information in the form of medication reconciliation was provided to nursing faculty in the toolkit and discussed in the seminar.

Steps in the Needs Assessment:

1. During the spring semester of 2012, the project administrator observed faculty teaching in the clinical foundations labs and in the clinical environment of first semester nursing students at a major southeastern university.
2. The project administrator participated in teaching classes in the Summer of 2012 where a new Electronic Health Record (EHR) and Bar Code Medication Administration (BCMA) technology was being implemented in two agencies where clinical faculty teach pre-licensure nursing students. Because of the complexity of this system, it became evident that faculty needed support in the

areas of EHR and BCMA technology.

3. In the Fall Semester of 2012, the project administrator assisted a faculty member with teaching three clinical groups the process of using the EHR as well as the BCMA technology. The faculty member identified a need for assistance with this because, for many students, this was the first experience with the EHR and BCMA. It was cumbersome and difficult to train a large clinical group about this new technology. It was determined that a PowerPoint presentation would be helpful to teach the use of the EHR and the BCMA in the clinical setting.
4. In the Spring of 2013, a formal needs assessment was conducted to determine if there was a need to conduct a safe medication practices seminar and make available a medication administration toolkit. The needs assessment survey indicated nursing faculty were positive about this project and the need for a toolkit and seminar. The project administrator identified several issues while completing part of the clinical practicum hours. The project administrator determined that clinical faculty members need support in these areas:
 - Assisting nursing students to prepare to administer medications using the Electronic Medication Administration Record (EMAR) and BCMA scanner technology.
 - Accessing information about the latest insulin regimens, insulin sensitivity scales, and the use of insulin pens. As stated above, ISMP (2007) reported that insulin is the most common medication error made among nursing students.

- Accessing the latest evidence based information about safe medication practices, for example the “Do not crush list”, high alert medications, drug shortages, and dose containers that contain higher concentrations of the drug.
 - Identifying errors, how to record them, and how to counsel students in this process.
 - Providing other environments in which to administer medications when the clinical environment is not conducive to all students administering medications.
5. The project administrator conversed with the department chair, who said that some faculty members, especially new or less experienced faculty members, are allowing students to give medications only one time a semester. This lack of medication pass experiences could lead to medication errors later in the program due to inexperience and lack of knowledge. It is impossible to supervise all faculty giving medications with students. This toolkit was an expeditious way to show faculty how to give medications at a rate that will allow more students to give medications on a clinical day. They were given tips on high risk medications, how to move through the medication pass process efficiently, and how to recognize unsatisfactory behaviors.
6. The project administrator conducted a needs assessment survey to further validate the need for this practice project implementation using an anonymous survey at a departmental meeting of undergraduate faculty. The Institutional Review Board (IRB) office at the participating agency had granted permission to conduct this

survey.

Assumptions

Faculty members often need educational support to learn new technologies in order to facilitate safe medication administration practices. Some faculty members verbalized frustration about large clinical groups and the inability to assist every student with medication administration and other aspects of patient care. These challenges are increased with the implementation of the EHR and BCMA technology. There was inconsistency with how many opportunities nursing students had to administer medications among nursing faculty members. Some faculty members that were interviewed for this capstone project stated they allow only three to four students to give medications in a clinical day, while others allow students one or two opportunities over the course of a semester. In contrast, some senior faculty members that were interviewed stated that they allow all students to administer medications throughout the semester.

Knowledge and confidence are essential to be successful in the role of a clinical nursing faculty member; however there is no consensus on how to assist pre-licensure nursing students with the medication administration process or how many opportunities for medication administration should be provided. Inefficient or inconsistent safe medication practices can result in lack of opportunities to administer medications and lead to potential medication errors. This provided the impetus to plan and implement a Safe Medication Practices seminar along with a Medication Administration Toolkit. The capstone project goal was to achieve increased knowledge and confidence among clinical nursing faculty teaching clinical in pre-licensure nursing programs, thus increasing opportunities for medication administration among pre-licensure nursing students.

Theoretical Framework

The theoretical framework for the capstone project was the middle range Social Learning theory by Bandura (1977). Table 1 outlines the theoretical framework for this capstone project. Empirical indicators for this capstone project included a pre and post-survey of nursing faculty regarding their knowledge of safe medication practices and if the use of a Medication Administration Toolkit and a Safe Medication Practices seminar would improve their knowledge and confidence.

Table 1

Theoretical Framework

Components	Components in Capstone Project
Metaparadigm	Person: nursing faculty teaching in a pre-licensure nursing program located in Southeastern United States Environment: seminar with use of video of safe medication practices performed in a clinical simulation high fidelity lab with DVD access to nursing faculty Nursing: safe Medication administration practices
Philosophy	College of Nursing philosophy
Conceptual Model	Teaching-Learning
Theory	Bandura's Social Learning Theory
Empirical Indicators	Pre and Post Survey by participants at the seminar Utilization of Medication Administration Toolkit

Philosophy

The College of Nursing philosophy is one of lifelong learning and service where this capstone project was implemented. Nursing faculty have to maintain knowledge of evidence based practice to teach nursing and display confidence in doing so while utilizing ever changing technology in the clinical arena. The university at which this capstone project took place has the motto “To serve” and the philosophy is evident in every aspect of the nursing educational process. This capstone project will carry on the philosophy of lifelong learning and service to the institution and community.

Concept: Teaching-Learning

The teaching-learning model is a structural framework that serves as a guide for developing specific educational activities and learning environments. The seminar and MAT served as a guide for nursing faculty teaching in a pre-licensure nursing program. The toolkit was designed to allow nursing faculty members to plan for clinical conferences that include evidence based practice principles that guide the medication administration process using the toolkit and information learned in the seminar as a guide.

Theory: Social Learning Theory

Bandura’s (1977) Social Learning theory suggests that nursing faculty can learn from one another. This takes place through observation, imitation, and modeling. Nursing faculty can learn the highest level of observational learning by organizing and rehearsing the modeled behavior in a clinical educator seminar that involves the use of a Medication Administration Toolkit and Safe Medication Practices seminar. Nursing faculty members are more likely to adopt and practice a modeled behavior if it results in outcomes they

value. Nursing faculty members will develop skills and understanding of new technology over time that includes a sound educational base as well as numerous experiences in the classroom, lab, and clinical environments. Bandura's theory suggests that nursing faculty members are more likely to adopt and practice a modeled behavior or skill that is practiced by expert nurses, and the behavior or skill has functional value.

Application of Theory to Capstone Project Design

The Social Learning theory of Bandura (1977) emphasizes the importance of observing and modeling the behaviors, attitudes, and reactions of others. Nursing faculty members, through the process of self-efficacy, develop goals and thus gain knowledge and clinical expertise in safe medication administration with pre-licensure students. The components of observational learning are attention, retention, reproduction, and motivation. The project administrator planned and implemented a face to face seminar that assisted faculty to gain medication administration knowledge through observational learning.

The purpose of this capstone project was to determine if the use of a Medication Administration Toolkit and Safe Medication Practices seminar improved the knowledge and confidence among nursing faculty teaching in a pre-licensure program. The conceptual framework for this capstone project was used to model the skill behavior and explore the process of nursing faculty increasing knowledge and confidence with medication administration. A new faculty member as a novice educator can lack confidence and ability, given the new technology and equipment that is available in the clinical lab and patient care environment to give medications with multiple nursing students. An expert nurse educator often has expert knowledge and confidence with

assisting multiple students to administer medications but still may need to acquire knowledge about current practices and new technologies.

Cangelosi, Crocker, and Sorrell (2009) utilized Benner's model to look at clinicians learning a new role as a clinical nurse educator in order to implement a clinical educator academy. The participants included in the study by Cangelosi et al. (2009) were expert clinicians moving to the role of a novice nursing educator. Cangelosi et al. (2009) found that education and mentoring are essential for nurses who are learning to teach. Schools of nursing find themselves looking for clinical educators on a routine basis. Many of these clinical educators are new or novice to the faculty member role and are in need of mentoring and modeling behavior to result in positive outcomes. When nursing clinical faculty members do not feel supported, the result is one that is filled with many challenges, and can find the clinical faculty member left with the feeling of a lack of confidence and sufficient knowledge about the latest evidence based practice issues concerning medication administration. The implementation of this capstone project was expected to improve nursing faculty confidence and knowledge level, while at the same time providing a means of mentoring and modeling behaviors and orienting clinical faculty members. It may also enhance the orientation process of nursing faculty who teach in the clinical arena, lab, and simulation environments in the future.

The purpose of this capstone project was to increase knowledge and confidence among nursing faculty assisting pre-licensure nursing students with the medication administration process. Minimal studies have been conducted to examine how nursing faculty deal with multiple nursing students administering medications while maintaining patient safety and gaining knowledge and confidence in this area. The project

administrator anticipated the use of a Safe Medication Practices seminar and Medication Administration Toolkit would increase the knowledge and confidence level among nursing faculty teaching in a pre-licensure program

Capstone Project Questions

Does the use of a Medication Administration Toolkit and Safe Medication Practices seminar improve knowledge and confidence among nursing faculty teaching in a pre-licensure nursing program?

Do nursing faculty members who primarily teach in the clinical setting evaluate the toolkit and seminar as an effective means for assisting nursing students with medication administration?

Definition of Terms

High-alert medications: insulin, opiates and narcotics, potassium chloride injectable, heparin, and sodium chloride solutions above 0.9%. The ISMP provides a list of these medications online.

Medication error: “any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems. These include prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use” (Cousins & Heath, 2008, p. 700).

Nursing: a caring relationship; which includes a condition of connection and concern (Alligood & Tomey, 2010).

Nursing student: a person enrolled in a pre-licensure baccalaureate nursing program, which upon successful completion of the program, is eligible to take the national registered nurse licensing exam and work in the role of the professional nurse.

Scenario: the description of the clinical lab environment and events that are programmed to occur during an interactive educational session with the human simulator, including reviewing a patient chart and receiving a shift report from the off-going nurse, the scenario interaction, and a debriefing session with review of the nursing students videotaped scenario in action.

Simulation: nursing interventions that mimic the reality of the clinical agency bedside experience.

Nursing faculty: faculty teaching in a pre-licensure baccalaureate nursing program.

Summary

This capstone project was needed, as there are few studies that look at nursing faculty issues with medication administration among nursing students. Nursing faculty members are teaching and learning in an ever-changing health care environment that requires a thorough understanding of medication administration. Nursing faculty are placed in clinical areas where patient acuity is increasing, new technology is being implemented, and more nursing students must be supervised on medication administration while supervising many other facets of patient care. The literature about faculty perceptions of assisting nursing students with medication administration is lacking or interventions to enhance patient safety with medications are lacking as well. Krautscheid, Orton, Chorpenning, and Ryerson (2011) reported that nursing students

perceived academic education as not real enough, and identified the need to learn how to manage distractions and interruptions with medication administration. Faculty may not feel comfortable with utilizing medication technology in the clinical environment with multiple students and increased acuity levels of assigned patients. Nursing faculty members need to be supported with constant change in technology occurring at the bedside. One way faculty members can be supported is to have access and education to utilize new medication administration technology in the lab environment thus making the transition in the clinical care environment easier. The need to implement an orientation program that addresses electronic medication dispensing systems such as the Pyxis and BCMA scanners with embedded alerts was identified as important so that nursing faculty can implement and learn to integrate new medication administration technology (Krautscheid et al., 2011).

CHAPTER II

Review of the Literature

The capstone project results add to the evidence based knowledge about faculty teaching pre-licensure nursing students. This capstone project informs nursing faculty and educational administrators about the effectiveness of the use of a Medication Administration Toolkit as part of a clinical orientation manual (Table 2). The video includes the depiction of a high-fidelity simulation and bar code system, showing mock students administering medications the “right” and “wrong” way, and an expert clinical faculty member demonstrating correct modeling and coaching behaviors. Nursing educators need to have a succinct place to refer to safe medication practices to assist their assigned nursing students with the medication administration process. It was important to determine if the use of a medication administration tool-kit promoted confidence and increased knowledge among nursing faculty. The project administrator anticipated that the results of the capstone project would help to increase the nursing faculty member’s knowledge of safe medication practices and improve confidence with assisting nursing students to administer medications. Lastly, if the use of a Medication Administration Toolkit (MAT) and Safe Medication Practices (SMP) seminar would result in promoting confidence and increased knowledge among nursing faculty members. The expected outcome was to provide more opportunities for nursing students to administer medications at the bedside.

Table 2

Medication Administration Toolkit Content

 Medication Administration Toolkit Content

Video simulation experience of nursing students administering medications in the simulation lab environment; National League of Nursing (NLN) simulation templates completed to accompany video; also available to faculty on a DVD.

Information guidelines from the Institute of Safe Medication Practices: do not crush list, high alert medications, and guidelines for nursing students.

Information about NEEHR (Networked Electronic Health Record) that is available in the concepts integration lab.

Resource list of journal articles that cover medication errors, safety, and medication administration practices.

Clinical conference case studies involving medication reconciliation, high alert medications, and evidence based practice for safe medication practices.

PowerPoint presentation that included how to use the Bar Code Medication Administration device and the Electronic Medication Administration Record that is available in the simulation lab.

Six minute method to assist students to administer medications faculty can utilize.

How to spot unsatisfactory behaviors.

Literature Review

Faculty members have a lofty task when educating students about giving medications. Patient safety and medication administration accuracy are major components of standards of care nursing students receive early in the educational process. According to Finkelamn and Kenner (2009), nursing students should learn all aspects of medication administration process: prescribing, dispensing, administering, monitoring, and management. The medication process should be reinforced throughout the nursing

curriculum. Student nurses are instructed about the six rights of medication administration. The six rights are (a) right patient, (b) right medication, (c) right dosage, (d) right route, (e) right time, and (f) right documentation (Potter & Perry, 2009). Some nursing experts recommend expanding these rights to include the right reason, right monitoring and evaluation, and the right to refuse the medication (Anderson & Townsend, 2010). This project administrator recommends including the right patient education.

Nursing faculty need access to the latest evidence based practice to guide clinical teaching practice, especially in the area of medication administration safe practices, for example, from a seminar or program. One such program was implemented by Cangelosi et al. (2009). Their program, the Clinical Nurse Educator Academy, was designed to assist expert clinicians assimilate to the role of clinical nurse educator. The Clinical Nurse Educator Academy included: designing a clinical day for students, evaluation, the incorporation of high-fidelity simulation into clinical education, and the role of educational research in designing effective clinical education programs. The project administrator implemented a seminar that utilized some of these teaching modalities to increase the confidence and knowledge of faculty teaching safe medication practices in a pre-licensure nursing program.

Nursing faculty can utilize the information from studies like Emrich (2010) that discusses practice breakdown in medication administration and states the nurse is at the sharp end of delivery of medications, meaning that the nurse is well positioned as the patients' last line of defense to protect patients from medication errors. Historical case studies were cited that involved patients with medication errors where the end results

were major adverse drug events including major illnesses and death. These historical cases could serve as valuable simulation scenarios for nursing faculty to learn more about safe medication administration practice in the form of a Medication Administration Toolkit and Safe Medication Practices Seminar.

Colleges of nursing are in a state of crisis due to the demands placed on them by employers. Health care agencies expect new nursing graduates to care for a full patient load of acutely sick patients (Leigh, 2008). Nursing studies have not focused on the faculty members' perspective with assisting nursing students to administer medications to patients in the clinical environment. Howard, Englert, Kameg, and Perozzi (2011) discussed the challenges nurse educators face with trying to find optimal opportunities for nursing students to learn the critical thinking skills necessary to care for patients with increasing acuity levels without jeopardizing patient safety. They suggested that some nursing schools are incorporating high-fidelity simulation into their curriculum to allow nursing students to practice decision-making skills in a controlled environment. They also expressed concern about a nursing faculty shortage that may translate into an increased instructor-to-nursing student ratio on the clinical units.

Often studies do not take into account the nursing faculty members' concerns about patient acuity or safety when assisting nursing students with medication administration and other complex skills. According to Hughes (2008), nurses can spend up to 40% of their time administering medications. Nurses must administer medications as well as monitor and evaluate the effects of medications. The rate of medication errors can increase if nurses are distracted, have increased workloads, and are inexperienced. Nursing faculty members must mentor pre-licensure nursing students with all of the latest

evidence based practice information about the medication administration process and the potential for interruption of patient safety.

Finkelman and Kenner (2009) discussed medication administration with regards to student nurses and suggested that simulation would be beneficial to test competency and provide learning opportunities for students without fear of harming patients. Nursing faculty may need to be oriented to utilize simulation to introduce medication related skills such as the Bar Code Medication Administration (BCMA) scanner. The result is that nursing faculty could develop confidence and increased knowledge with medication related technology (Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing at the Institute of Medicine, 2010). A SMP seminar and MAT would provide an excellent method to orient nursing faculty to safe medication administration practices.

Nursing education is unique in that numbers of nursing students are mandated by licensing agencies and in North Carolina that number cannot exceed ten. The clinical rotation, which largely occurs in the acute care hospital environment, is where students actually apply knowledge learned in the classroom. Nursing faculty can expect to assist a large number of nursing students to administer medications in the clinical area. Several factors may decrease the nursing faculty member's comfort zone when assisting nursing students to administer medications. Some of these factors include the increased acuity level of patients in the acute care health arena and the utilization of technology such as the BCMA devices. Presently nursing faculty often handle a ratio of ten to one and are expected to assist with the medication administration process as well as other complex skills that require direct observation. Currently, there is limited research available about

how to assist faculty to provide quality learning experiences for multiple nursing students administering medications to multiple patients. The project administrator anticipates this capstone project will improve the knowledge and confidence among nursing faculty assisting pre-licensure nursing students with safe medication practices.

The current literature involving medication errors, evidence based nursing interventions with the medication administration process, and the faculty use of clinical simulation to determine the best pedagogies to promote patient safety and include in the Medication Administration Toolkit were reviewed. This review revealed that medication errors that involve patients 65 and older cost \$887 million annually to treat (Aspden, 2007). The information in this report has significance, as nursing faculty assign many patients over the age of 65 and the potential for error is great. Recommendations from this report included forming partnerships with patients that include active listening and education about medications.

Medication reconciliation becomes an important component of this communication and patient education partnership. Anderson and Townsend (2010) noted that administration errors accounted for 26% to 32% of all medication errors made. Nurses spend a great deal of time administering medications and evaluating their effects. The MAT and SMP seminar included the medication error definition from the National Coordinating Council for medication error, reporting, and prevention which defines a medication error as:

Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such

events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use (Cousins & Heath 2008, p. 700).

In order to deal with the ever changing health care environment where patient acuity is increasing, nursing schools are integrating simulations into its curricula as pedagogy for educating nurses (Waxman, 2010). This method of instruction lacks research to support if this is a reliable method to educate pre-licensure nursing students about safe medication administration practices. Nursing faculty members must learn about many high technology products including BCMA in order to teach and evaluate students in the clinical care environment. Nursing faculty members are faced with many challenges in order to prepare nursing students to practice safely and care for patients in many complex health care environments (Todd, Manz, Hawkins, Parsons, & Hercinger 2008; Waxman, 2010).

According to Wolf, Hicks, and Serembus (2006), practice with drug calculations in the clinical environment may be limited due to agency policies and the lack of medication administration opportunities. Wolf et al. (2006) states that additional research is needed to identify teaching strategies to improve the medication administration ability of nursing students. One way to accomplish this is through the use of a medication administration toolkit that includes a template of how to utilize the pedagogy of clinical simulation experiences that can be applied in the clinical care environment. Clinical simulation that includes medication administration with nursing students has been shown

to decrease medication errors (Sears, Goldsworthy, & Goodman, 2010).

Nursing faculty need best practice information in order to plan for clinical learning and to follow safe medication practice guidelines. Research studies by Wolf et al. (2006) and Sears et al. (2010) looked at issues with medication errors and clinical placements that include the use of clinical simulation to learn more about the medication administration process. These studies validate the need for nursing faculty to provide for medication administration opportunities that can be planned for in the clinical environment or the simulation learning environment. Wolf et al. (2006) reviewed 1,305 medication errors made by student nurses over a five year period. The researchers found that student nurses with limited clinical experience made more medication errors. The common characteristics of medication errors included omission and wrong dose, performance deficits, and communication problems. This study found that more research involving teaching strategies is needed to enhance clinical reasoning skills with medication administration. Wolf, Ambrose, and Dreher (1996) conducted a similar study involving medication errors and harmful outcomes. Interestingly, Wolf et al. (1996) examined similar medication errors and the need for nursing students to develop clinical inference skills to determine harmful outcomes for patients having had a medication error occur. These authors support increasing the experiences of nursing students with the medication administration process.

Sears et al. (2010) conducted an experimental study of 54 baccalaureate of science in nursing (BSN) medical-surgical and maternal-child nursing students utilizing clinical simulation and medication administration. The utilization of clinical simulation in the Ontario University Nursing program was started due to the difficulty in finding

enough clinical placements to meet the needs of nursing students. This study included a control and experimental (simulation) group. Students in the experimental group made seven errors; far less than the control group that made 24 errors. The researchers found that simulation contributed to fewer medication errors. These findings suggest that simulation education may contribute to a reduction in medication errors among nursing students, and provide an additional environment for nursing faculty to gain knowledge and confidence with assisting students with safe medication practices. The researchers concluded that the study should be replicated on a larger scale because of the sample sizes being constrained by available clinical placements. The researchers pointed out that there is a gap in the research to demonstrate if learning and skills acquired in the simulated environment can be transferred to the actual clinical experiences.

According to a study conducted by Davidson and Rourke (2012), more than 90% of the study participants (clinical faculty) thought it was essential to include information about the role of the clinical nursing instructor in clinical simulation experiences as part of the faculty orientation process. Participants in this study unanimously agreed that every aspect of student evaluation should be included in the orientation process. The study participants also identified a need to be able to access key clinical policies and procedures online. A medication administration toolkit that includes a succinct method to provide nursing faculty with information about safe medication practices that includes the use of clinical simulation can serve to improve knowledge and confidence. Nursing faculty can promote safe medication practices when they are confident and knowledgeable about the medication administration process. Faculty can utilize the MAT and information learned in the SMP seminar as part of an orientation experience to gain

knowledge and confidence with medication administration practices that are common to a particular clinical practice environment. This will promote confidence in nursing faculty assisting pre-licensure nursing students to safely administer medications.

Medication Errors and Students

Nursing faculty members are also faced with medication errors when working with students. Reid-Searle, Moxham, Walker, and Happell (2010), reported that there is “paucity” of research, which examines a nursing student’s contribution to medication errors (p. 225). This study identifies that nursing students value the supervision from their nursing faculty. The study involved 28 senior baccalaureate nursing students and utilized interviews to look at the amount of supervision of medication administration the students received. The nursing students in this study reported a lack of quality and inadequate level of supervision was available for medication administration. The problem areas identified by the students were attitudes of nurses, communication, and perceived busyness of nurses. Communication is paramount in promoting safety with medication administration. Nursing students value the mentoring of nursing faculty in safe medication practices. The researchers recommended further studies to investigate the extent to which medication errors are occurring to determine if inadequate supervision is a factor. Nursing programs need to look at the quality of supervision nursing students are receiving to ensure standards of care are met. Nursing faculty must be provided with an orientation to the latest technology to promote safe medication practices.

Nursing faculty have a huge role in mentoring students with evidence based practice interventions that promote patient safety and a just culture to ask questions when unsure. The MAT and SMP seminar for this project contained the most current safe

practices and technology dealing with medication administration to improve knowledge and confidence among nursing faculty assisting nursing students with safe medication practices.

Synthesis of Evidence

Strengths

Based on the literature review, this capstone project that included a SMP seminar and MAT with a simulation video in a DVD format and evidence based practice interventions provided an ideal format to assist faculty in the clinical role of supervising nursing students with safe medication practices. Due to the complex health care environments in which nursing students actually administer medications, the development of a MAT and SMP seminar to promote faculty confidence and enhancing knowledge, while maintaining a safe environment for nursing students would be ideal to promote evidence based practice interventions. According to Waxman (2010), scenarios should be based on clear learning objectives and evidenced based practice research in order for the program to be successful. Nursing faculty can be mentored to assist nursing students to administer medications in a safe environment like that of the lab and then translate this safe practice to the clinical environment. The end result will be one that is a positive outcome for the patient and results in avoiding medication errors as a nursing student and that of progressing to the role of registered nurse. A SMP seminar and MAT can provide the means to orient nursing faculty to evidence based safe medication practices. These can be a means of mentoring and coaching nursing faculty members to meet the challenges of assisting multiple nursing students with the medication administration process.

Weaknesses and Gaps

The major gaps are lack of current studies involving clinical simulation that include the administration of medications, as well as teaching methods in the clinical care environment for nursing faculty to utilize when assisting nursing students with the medication process. It should be noted that there were no research articles found that dealt with faculty mentoring and faculty development using medication administration within the clinical environments. Nursing faculty need mentoring with adequate resources made available to assist with the transition to clinical faculty member and how to assist with the administration of medications and promote patient safety among nursing students in the clinical simulation and practice environments.

There is a gap in the research to demonstrate whether medication errors would decrease among nursing students who receive medication error prevention strategies from faculty and practice these strategies in the simulated laboratory and clinical environment. There is very little evidence to support nursing faculty issues in assisting nursing students to administer medications in the clinical environment, and the impact technology and increased patient acuity have on limiting those experiences. The gap in the research and literature also validated the need to implement a project that involved nursing faculty and the issues surrounding the administration of medications in clinical patient care environments. Medication error studies among nursing students have been conducted in the past, however studies that focus on nursing faculty and the role they play have been limited in improving the knowledge of medication safety practices and confidence in the clinical arena given the increasing technology at the bedside. Studies over the last several

years have shown that medication errors are occurring at an alarming rate, and many technological advances have been made to try to reduce errors and improve patient outcomes.

Limitations

Nursing faculty need a mechanism such as a Medication Administration Toolkit (MAT) and Safe Medication Practices (SMP) seminar to improve knowledge and confidence in order to improve safe medication practice standards in clinical practice and classroom environments. The Institute for Safe Medication Practices cites certain conditions that promote student-nurse related medication errors including: nonstandard times, documentation issues, medication administration record unavailable or not referenced, held or discontinued medications, monitoring issues, non-specific doses dispensed, oral liquids drawn up in parenteral syringes, and preparing drugs for multiple patients (ISMP, 2007). These conditions were addressed in the Medication Administration Toolkit which included a template for the clinical simulation scenario environment, as well as other safe medication administration practice documents. The ISMP also addressed the high-alert medications where extra precautions should be taken (ISMP, 2007). According to Wolf et al. (2006), insulin which appears on the high-alert drug list by the ISMP, was the highest-frequency single medication error reported for nursing students. This capstone project aids in advancing the knowledge base for methods to promote patient safety with medication administration among nursing students through the nursing faculty use of a MAT and SMP seminar.

CHAPTER III

Methodology

Faculty teaching in pre-licensure programs may experience anxiety when assisting nursing students to administer medications, especially when those experiences involve an acute care environment and complex technologies such as the Bar Code Medication Administration (BCMA) scanner and Electronic Health Record (EHR). This capstone project offered a Medication Administration Toolkit (MAT) and Safe Medication Practices (SMP) seminar to improve knowledge and confidence among nursing faculty assisting with pre-licensure nursing students administering medications.

Purpose

The purpose of this capstone project was to determine:

Does the use of a Medication Administration Toolkit and Safe Medication Practices seminar improve knowledge and confidence among nursing faculty teaching in a pre-licensure nursing program as measured by the pre and post-survey?

Do nursing faculty members who primarily teach in the clinical setting evaluate the toolkit and seminar as an effective means for assisting nursing students with medication administration?

Capstone Project Design

This capstone project used a descriptive pre-post survey design. This design was appropriate for this capstone project because of the efficiency and the ability of a survey to determine if faculty-reported knowledge and confidence would improve with the implementation of the intervention. The major strategy was the design and

implementation of a Safe Medication Practices seminar and a Medication Administration Toolkit for clinical faculty.

Setting

The capstone project was implemented at a university college of nursing (CON) that is located in a medium-sized southeastern city. The target audience was nursing faculty teaching in a pre-licensure nursing program. The toolkit was developed and contained several items which included: (1) safe medication practices, (2) a video depicting a faculty member assisting students administering medications including the use of a computer workstation for charting and a medication administration scanner, (3) simulation templates for the patient situations demonstrated in the video, and (4) other documents to assist faculty with the medication administration process. The video used in the toolkit for this seminar was produced at a simulation lab at the CON. The safe medication practices seminar was held in a multipurpose classroom in the CON on two separate occasions.

Sample

All faculty teaching baccalaureate pre-licensure nursing students were invited to participate because of their role in teaching medication administration practices to pre-licensure nursing students and their participation in teaching the clinical component of nursing courses offered in the CON pre-licensure nursing program. Although the full population of nursing faculty would have been ideal, a sample size of 30 faculty was desired. The population was homogenous, the anticipated participation rate was high, and the anticipated attrition rate was low.

Ethical Considerations

Protection of human subjects was assured through an institutional review board (IRB) process at both the project administrator's university and the site of the project. All instruments were coded without any individual identifiers. The project administrator explained the capstone project, that participation was voluntary, and that the surveys would take approximately 10 minutes each to complete at the beginning and end of capstone project. Participants in the seminar were given a sealed packet with the consent document and the surveys, as well as the DVD containing the Medication Administration Toolkit, and a gift card for participating. The project administrator did not know which packets had completed surveys until the packets were opened for analysis of data. The surveys had a coded number that was the same on both the pre- and post-survey. All participants were instructed to place their completed pre- and post-surveys in the packet, seal the provided envelope, and return to a designated assistant who was not the project administrator. No identifiers linked the participants to the capstone project or their completed surveys. The data results remained anonymous, and the final results were recorded as aggregates.

Methods

This capstone project included a non-randomized, pre- and post-survey design to investigate faculty knowledge and confidence in assisting in the educational process of pre-licensure nursing students with medication administration. Faculty attending the SMP seminar completed a pre-survey (Appendix A). The project administrator offered the SMP seminar on two different occasions, allowing as many faculty to attend as possible.

The seminar included the Medication Administration Toolkit in a DVD format given to all faculty members attending the seminar who teach pre-licensure nursing students in a university setting serving Southeastern United States.

The components of the toolkit were: (1) Institute of Safe Medication Practices (ISMP) guidelines for assisting nursing students, (2) ISMP high alert medications, (3) FDA (Food and Drug Administration) and ISMP lists of look-alike drug names with recommended tall man letters, (4) ISMP list of error-prone abbreviations, symbols, and dose designations, (5) ISMP error-prone conditions that lead to student nurse-related errors, (6) ISMP do not crush list, (7) ISMP fentanyl patch advisory, (8) ISMP acute care guidelines for timely administration of scheduled medications, (9) sample medication cards of frequently administered medications on a selected surgical unit in an acute care hospital, (10) video recording of faculty member assisting nursing students with the medication administration process, and (11) National League of Nursing (NLN) simulation templates that outlined the patient situations involving the medication process in the video. All of these items were on a DVD for the participants to take away from the seminar.

The medication clinical simulation scenario video included in the MAT was developed to address major safety issues with administering multiple medications to complex ill patients. The video contained in the DVD depicted a nursing faculty member that guided the student with the medication administration procedure and used a teaching plan that included a template from the NLN website. Permission was granted by the NLN to utilize the template in the capstone project (Appendix B). Volunteer nurses depicted nursing students administering medications in a simulation lab. The actors were

provided with scripts and dressed the part of nursing students by wearing scrubs. The video contained two scenarios: one of a student nurse actor who administered medications following the six rights and the second one of a student nurse actor who did not follow the six rights of medication administration. Evidence based practice was the focus of the video so nursing faculty participants could refer to the video for guidance in assisting students with medication administration, including the importance of communication utilizing the Situation, Background, Assessment, and Recommendation (SBAR) format. This video depicted a BCMA scanner connected to a workstation on wheels to administer medications at the bedside. Medication administration charting was available through the software Networked Educational Electronic Health Record (NEEHR) leased by the CON at the project capstone site.

Permission was granted from the ISMP to utilize medication related forms as long as they were duplicated in the same format (Appendix C). The information along with the templates contained in the toolkit will allow faculty to duplicate the scenario in the simulation environment.

Supplementary materials were available on the DVD, as well as information that supported current medication practice in the form of suggested clinical conferences to encourage discussion of the nurse's role in medication administration safety. Participants received a \$10 gift card for their participation in the capstone project. The printed materials from the MAT were also made available in a DVD format for the capstone project participants to review and utilize.

Instruments

The instruments used to measure knowledge and confidence were a pre-survey

(Appendix A) and post-survey (Appendix D). The surveys were developed by the project administrator in conjunction with the chair of the proposed capstone project and feedback given from the capstone project committee, as well as an expert research faculty member for content validity. The capstone project compared differences in the pre-survey and post-survey nursing faculty members' responses after the project was implemented. The project administrator attempted to prevent any influences or actions (bias) in this project analysis that would distort the findings or slant them away from the true or expected results of this capstone project. Also, the project administrator prevented bias for this capstone project by having a conceptual and operational definition of study variables, sample size and selection, valid and reliable instruments, and data collection methods that partially controlled the environment. There was tight control of where the anonymous data was stored. The project administrator maintained consistency and controls during data collection so that the integrity and validity of the project was protected (Burns & Grove, 2007). Data management was organized and recorded so that rapid entry into an Excel spreadsheet via a computer could take place.

Data Collection

Survey instruments were designed to gather comparison information from the nursing faculty participants. The survey item content was based on the capstone project's conceptual framework, which was developed from the literature review and interview with expert faculty involved with research in the capstone project facility environment. The instruments were comprised of rating-scale items, closed-ended items to gather demographic information, and one open ended question to allow participants to add comments about the seminar or medication administration toolkit. The majority of the

statements were designed to address knowledge and confidence among nursing faculty teaching clinical involving administering medications. Participants rated their level of agreement on the surveys using a 5 point Likert-type scale. The conversion was 1 for strongly agree and 5 for strongly disagree with neutral as 3. Demographic questions were included as well on the surveys in order to provide an opportunity to analyze the impact of variables such as age and education on participants' knowledge and confidence.

The survey tools were accompanied by an informed consent letter in a packet along with the other capstone project materials. The participants received the packet at the SMP seminar. The seminar provided for a one-on-one approach which enhanced the participant response rate. Each participant was provided with an envelope that could be sealed and returned as directed in the consent letter.

Data Analysis

Descriptive statistics were analyzed using the Statistical Package for Social Sciences for Microsoft Windows (SPSS, version 21 IBM). Data were entered into an Excel spreadsheet according to pre-post survey groups assigned numbers 1 through 31. Numbers were assigned to the surveys so that information could be matched from the participant's pre- and post- survey results. Thirty-one faculty attended the seminar and 28 faculty returned completed surveys. Two of the returned surveys had missing data totaling greater than 10% so these faculty surveys were not included in the final data analysis. Comparison tables were developed to show the mean and standard deviation (SD) for the matched questions in the pre- and post- survey participant groups.

CHAPTER IV

Results

The purpose of this capstone project was to determine if the use of a seminar on safe medication practices would improve the knowledge and confidence among nursing faculty teaching in a pre-licensure nursing program. The nursing faculty at a large southeastern university college of nursing (CON) was invited to attend a seminar about safe medication practices for students in clinical rotations. Faculty who chose to participate in the capstone project completed an anonymous survey before and after the seminar. Data was collected on demographics, as well as faculty knowledge about medication safety and comfort working with students administering medications in the clinical setting.

Demographics

Thirty-one faculty members participated in the medication seminar. Of those completing surveys, 26 were usable for data analysis. Most of the participants were female. The attendees were fairly evenly split among those who teach at both the junior and senior levels (39%), only at the junior level (34.6%), and only at the senior level (36.9%) of the baccalaureate program. Half of the faculty had master's degrees in nursing and the other half had a doctorate in nursing (26.9%) or a non-nursing doctorate (19.2%).

Ages and years of experience teaching nursing of attendees are outlined in Table 3. Faculty ages 51-60 years represented 50% of the faculty attending the seminar. Sixty-nine percent of the faculty participating in the capstone project had been teaching more than 10 years.

Table 3

Age and Years of Nursing Education Experience

Demographics							
Age (years)	25-30	31-40	41-50	51-60	61 or >		
Percent	3.8	3.8	30.8	50	11.5		
Experience (years)	0-<1	1-2	3-4	5-6	7-8	9-10	>10
Percent	3.8	7.7	3.8	3.8	0	11.5	69.2

Knowledge and Confidence

Capstone project question one was “Does the use of a Medication Administration Toolkit and Safe Medication Practices seminar improve knowledge and confidence among nursing faculty teaching in a pre-licensure nursing program as measured by the pre and post-survey?” Nursing faculty answered pre-survey and post-survey questions on knowledge and confidence of safe medication practices. The project administrator compared survey responses of the participants to look at knowledge gained from the seminar and the medication administration toolkit.

Knowledge

Some of the items on the survey evaluated if there was knowledge improvement about the latest evidence based practice guidelines from the Institute of Safe Medication Practices (ISMP) and other items contained in the toolkit and discussed in the seminar. As a result of the seminar, some of the items included in the survey were related to: (a)

students complete medication cards, (b) potential medication errors, (c) high alert medications, (d) ISMP practice guidelines, and (e) expanding the rights of medication administration. Some of the highlights were: students should complete medication cards, student errors do constitute potential medication errors, knowledge of high alert medications, and ISMP guidelines. The results are shown in Table 4.

Table 4

Results of Faculty Knowledge Pre and Post Seminar and Use of Toolkit

Knowledge statements	Pre-survey		Post-survey		<i>p</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	
a) Students complete med cards	1.92	.95	1.48	.87	.018*
b) Potential Med errors	2.0	1.1	1.62	.75	.03*
c) High Alert Meds	1.75	.97	1.40	.58	.036*
d) ISMP guidelines	2.44	1.08	1.64	.95	.001*
e) Expanding 6 “rights”	1.8	.87	1.42	.64	.035*

**p* value: significant at < .05, *SD* = Standard Deviation

There was no change in faculty assessment of their knowledge about what constitutes a medication error from the beginning of the seminar ($M = 1.54$, $SD = .91$) to the end of the seminar ($M = 1.54$, $SD = .81$), where 1 = *strongly agree* with the phrase “I am confident in what constitutes a medication error”.

In response to the statement “I consider a potential medication error (those you prevented from occurring) as a student medication error”, where 1 = *strongly agree*, there

was a statistically significant increase by paired t-test in recognizing this as a medication error from pre-seminar ($M = 2.00$, $SD = 1.1$) to post-seminar ($M = 1.62$, $SD = .75$), $t(25) = 2.30$, $p = .03$ (Table 4). Faculty indicating they were familiar with high alert medications, where 1 = *strongly agree*, had a statistically significant increase by paired t-test from pre-seminar ($M = 1.75$, $SD = .97$) to post-seminar ($M = 1.40$, $SD = .58$), $t(24) = 2.22$, $p = .036$ (Table 4).

Similarly, faculty increased their familiarity with ISMP student guidelines. The change from pre-seminar ($M = 2.44$, $SD = 1.08$) to post-seminar ($M = 1.64$, $SD = .95$) was statistically significant by paired t-test, $t(24) = 4.00$, $p = .001$. On the post-survey, participants were asked whether they agreed with the statement that “the six rights of medication administration needed to be expanded, for example to include the right education and right monitoring/evaluation” with 1 = *strongly agree*. Faculty indicated they agreed to strongly agreed with this statement ($M = 1.42$, $SD = .64$) (Table 4).

It was also noted that faculty indicated they believed nursing students should complete medication cards on the most frequently used medications on the assigned units, where 1 = *strongly agree*, increased significantly from pre-seminar ($M = 1.92$, $SD = .95$) to post-seminar ($M = 1.48$, $SD = .17$). This difference was statistically significant by paired t-test, $t(24) = .529$, $p = .018$. Medication card samples were included in the toolkit. The project administrator advocates the use of medication cards with specific information to better prepare the student for the medication administration process thus improving knowledge of safe medication administration practices.

Confidence

Several items on the pre-survey and post survey dealt with questions dealing with faculty confidence level and the medication administration process. Some of these included: (a) confidence with allowing a group of ten students to administer medications, (b) how many students can safely administer medications, (c) confidence in reporting medication errors, (d) bar scanning medication technology impairs my ability, and e) the acuity level of assigned patients limits my ability to safely assist students with administering medications. Faculty were asked how many students they felt could safely give medications on a clinical day. Choices ranged from one to ten students. There was a slight decrease in the number of students faculty felt comfortable with giving medications from pre-seminar ($M = 6.3$, $SD = 2.23$) to post-seminar ($M = 5.98$, $SD = 1.94$), which was not a statistically significant difference by paired t-test, $t(24) = .582$, $p = .566$ as noted in Table 5. Faculty members were consistent with discussions held in the seminar and with feedback on the survey that fewer students should administer medications in the clinical environment.

The survey did not show a significant statistical analysis with how many students should administer medications, however numbers that faculty agreed should administer medications had a mean of six students on the post-survey. This indicates faculty members do not have confidence with larger numbers of students administering medications on the same clinical day. One faculty participant commented in the open ended question at the end of the post-survey, "If students have to crush/cut or mix medications, then it takes even longer to pass meds. With pyxis meds, since it takes two RNs that takes even longer and requires more hand transfer with meds." Another faculty

member commented that “I don’t feel comfortable with groups of 10 students giving multiple meds with multiple patients.”

Table 5

Results of Faculty Confidence Pre and Post Seminar and Use of Toolkit

Confidence	Pre-survey		Post-survey		<i>p</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	
a) How many students give meds	6.3	2.23	5.98	1.94	.566
b) Meds adm in simulation environment	1.46	.71	1.19	.40	.07
c) Confidence reporting errors	1.76	.97	1.68	1.07	.703
d) Acuity level limit faculty ability	2.08	.24	1.85	.25	.265
e) Confidence with BCMA	2.76	.27	2.29	.29	.029*

**p* value: significant at < .05, *SD* = Standard Deviation

Prior to the seminar, faculty generally agreed that “having nursing students administer medications in a clinical simulation scenario increases opportunities for medication administration and decreases the risk of medication errors in the clinical care environment” ($M = 1.46$, $SD = .71$, where 1 = *strongly agree*). At the completion of the seminar, faculty strongly agreed that “it is important to include medication administration in the clinical simulation scenario environment using high fidelity patient simulators ($M = 1.19$, $SD = .40$). These statements had a similar sentiment and demonstrated an increase

in faculty support of medication administration being included in simulations, $t(25) = 1.895, p = .070$.

Confidence in reporting medication errors and completing necessary forms when a student makes a medication error increased slightly from pre-program ($M = 1.76, SD = .97$) to post-program ($M = 1.68, SD = 1.07$), but this was not statistically significant, $t(24) = .385, p = .703$.

The acuity level of assigned patients was felt to limit the faculty members' ability to safely assist students with administering medications. Faculty generally agreed with this statement pre-seminar ($M = 2.08, SD = .24$) and more strongly agreed post-seminar ($M = 1.85, SD = .25$). This was not a statistically significant difference by paired t-test, $t(25) = 1.14, p = .265$.

Faculty did not have much confidence with Bar Code Medication Administration (BCMA), agreeing with the statement "the bar scanning medication technology impairs my ability to safely administer medications in a timely manner with multiple nursing students". Pre-seminar, faculty were neutral about this statement ($M = 2.76, SD = .27$), but post-seminar they were more likely to agree with the statement ($M = 2.29, SD = .29$). This was a statistically significant difference by paired t-test, $t(20) = 2.35, p = .029$ as noted in Table 5.

Generally faculty disagreed with the statement that they "feel confident about having a group of 10 students administer medications during the same clinical day". Mean score pre-seminar was 3.8 ($SD = 1.44$) post-seminar was 3.6 ($SD = 1.35$). Instead, faculty indicated that it would be helpful to assign fewer students to clinical groups to lessen the problem of potential medication errors and this did not change significantly

from pre-seminar ($M = 1.40$, $SD = .18$) to post-seminar ($M = 1.56$, $SD = .21$). Faculty members who agreed or strongly agreed with this statement were asked to identify the number of students they believed would be ideal to have in a clinical group on the same day. Choices were less than 5, 6 to 7, 8 to 9, and 10. Frequencies of these answers are shown in Table 6. On the open ended post-survey response, a faculty member commented “I can’t feel comfortable with 10 students with multiple patients”. Another faculty member commented “not all faculty can confidently lean on nurses to help with medication administration”. Table 6 supports the comments made from nursing faculty participants on the surveys as well as discussion in the seminar.

Table 6

Ideal Number of Clinical Students

Frequency %	Less than 5	6-7	8-9	10	Did not reply
Pre-Seminar	19.2%	61.5%	3.8%	0%	15.4%
Post-Seminar	23.1%	65.4%	3.8%	0%	7.7%

Evaluation of the Toolkit by Participants

The second question in the project was “Do nursing faculty who primarily teach in the clinical setting evaluate the toolkit and seminar as an effective means for assisting nursing students with medication administration?” Attendees were also asked to indicate the impact of the toolkit on their confidence and knowledge, by indicating if they felt their knowledge and confidence level improved, stayed the same, did not improve, or they weren’t sure. There was also an option to indicate that they would need more

utilization of the Medication Administration Toolkit before evaluating its impact.

Participants for the most part agreed their knowledge level had improved with the use of the toolkit. Distribution of answers are shown in Table 7 and Figure 1. Participants were provided with an opportunity in the post-survey to comment about the toolkit. Several comments were made about the use of the toolkit. Some of the faculty comments included:

- More tools to safely administer medications in the clinical setting with students
- Need more examples of how to interact with student at the med cart
- The toolkit will be helpful
- The toolkit should have an electronic version and have an app
- Simulation videos in the toolkit outline good examples of critical thinking for students

The toolkit was accessible to faculty with the DVD provided at the seminar. The project administrator plans to keep the toolkit updated and have faculty access to this toolkit via the college Sharepoint web site. Faculty that attended the seminar sent many emails after attending the seminar about how much they enjoyed the seminar and asking about using the video provided in their labs and clinical course components.

Table 7

Evaluation of Change in Confidence/Knowledge Level with Toolkit

Response	Number (%)
Improved	21 (80.8%)
Stayed the same	3 (11.5%)
Did not improve	0
Need more utilization of the Medication Administration Toolkit	2 (7.7%)
Not sure	0

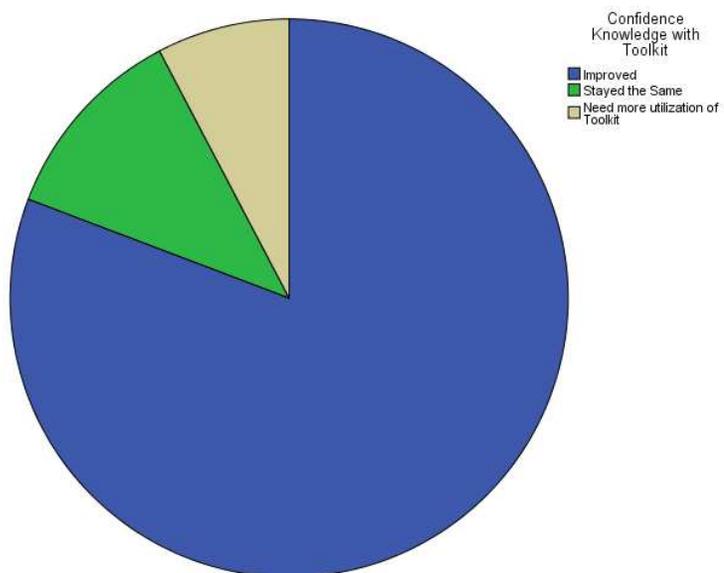


Figure 1. Change in self-reported knowledge and confidence level with seminar and toolkit

An independent samples *t*-test was conducted to determine if there was a statistically significant difference ($p < .05$) for knowledge and confidence among nursing faculty teaching in a pre-licensure nursing program after and having access to a medication administration toolkit. The *p*-value was significant at .004 for knowledge and confidence among nursing faculty utilizing the toolkit. Figure 1 reflects the change in self-reported knowledge and confidence levels after nursing faculty had access to the toolkit.

Summary

A descriptive survey design was used to examine the knowledge and confidence of nursing faculty members before and after the implementation of a safe medication practices seminar and utilization of a medication administration toolkit. The data for the capstone project questions were obtained and analyzed from 26 nursing faculty participants attending the seminar.

CHAPTER V

Discussion and Conclusions

This chapter includes a discussion of the findings related to each project question, future implications for nursing education, and recommendations for further study.

Published research about faculty confidence and perceptions of supervising and assisting nursing students with the medication administration process was not found. The purpose of this capstone project was to determine if the use of a Medication Administration Toolkit (MAT) and Safe Medication Practices (SMP) seminar would improve the knowledge and confidence among nursing faculty teaching pre-licensure nursing students. The information gained in this capstone project will be used to further develop and implement an orientation program for nursing faculty teaching in the clinical and lab components of pre-licensure nursing courses at the college where the capstone project took place.

Data were collected using a pre-post survey for nursing faculty. The second survey differed slightly in that there was an open ended question that asked for specific comments about the toolkit and seminar that were included in this paper. Participants used a Likert-type scale to rate statements related to knowledge and confidence with relation to the administration of and safe medication practices.

Discussion of Capstone Project Questions

Capstone Project Question 1

Does the use of a Medication Administration Toolkit and Safe Medication Practices seminar improve knowledge and confidence among nursing faculty teaching in a pre-licensure nursing program as measured by the pre and post-survey?

The results of this capstone project indicate that the SMP seminar and MAT was an effective means to disseminate knowledge to nursing faculty teaching in an pre-licensure baccalaureate nursing program.

Support of Bandura's Social Learning Theory

These findings support Bandura's Social Learning Theory, in that the actual knowledge and confidence gained in attending the SMP seminar and use of a MAT can be mentored and modeled to nursing faculty. The seminar allowed nursing faculty to learn from observation, imitation, and modeling. Based on the discussion that took place in the seminar, nursing faculty attending the seminar planned to adopt the safe medication practices learned in the seminar as well as those shown in the toolkit. One faculty member asked if they could utilize the SBAR component located within the MAT video in the medication skills lab they instructed in and commented how positive and helpful this process was.

According to the theory, nursing faculty members will more likely adopt and practice modeled behavior like that learned in the SMP seminar if it results in outcomes they value. This seminar and toolkit learning strategies assisted nursing faculty in reinforcing previously learned concepts as well as gaining new knowledge and confidence about safe medication practice guidelines. To summarize, the results of this

capstone project support the use of a seminar and medication administration toolkit as an educational strategy to improve knowledge and confidence with the medication administration process among nursing faculty teaching in a pre-licensure nursing program.

Capstone Project Question 2

Do nursing faculty who primarily teach in the clinical setting evaluate the toolkit and seminar as an effective means for assisting nursing students with medication administration?

The post survey addressed the question as “After having had access to the Medication Administration Toolkit and attending the Safe Medication Practices seminar, which of the following statements best describe your confidence/knowledge level with medication administration and safe practices?” Eighty percent of the nursing faculty participants indicated that the seminar and toolkit improved their knowledge. This suggests that the educational intervention of the seminar and toolkit was effective for improving knowledge and confidence among nursing faculty assisting nursing students with the medication administration process.

One open ended response offered on the post-survey by a nursing faculty member addressed the toolkit and seminar by stating, “Very good strategies outlined for safe, efficient medication administration by students in the clinical area. Simulation videos outline good examples of critical thinking for students”. This statement emphasizes the benefit of using a medication administration toolkit and seminar as sound educational strategies to assist nursing faculty with gaining knowledge and confidence and transferring this knowledge to assist nursing students with the medication administration

process.

Several nursing faculty commented that they did not feel comfortable with a group of ten students giving multiple medications with multiple patients. Another faculty commented in an open ended response on the survey that “The toolkit will be helpful. Even with the toolkit, there are not safeguards in place to having the faculty responsible for ten patients”. Nursing education administrators will need to further investigate nursing faculty confidence levels with the medication administration process in the clinical care environment.

The positive responses of the nursing faculty attending the seminar are in alignment with other researchers, who found that the use of a clinical educator academy or in this case a medication administration seminar is necessary for mentoring and education for nurses who are learning to teach (Cangelosi et al., 2009). The outcome of this capstone project improved nursing faculty confidence and knowledge as well as knowledge about teaching integration of new medication administration technology in the clinical environment that is considered vital as noted by Krautscheid et al., 2011.

The SMP seminar and MAT provided a means for nursing faculty to review evidence based practice for safe medication administration guidelines. These medication safety practice guidelines were organized in the toolkit to promote learning and confidence with the medication administration process. The need to conduct this capstone project came about from an awareness of increasing acuity level of patients in the clinical area and the growing technology nursing faculty must be familiar with in order to assist nursing students with the medication administration process. Safety is paramount for nursing faculty assisting with safe medication practices.

An unanticipated finding from the medication seminar conducted indicated that experienced faculty at the end of the seminar did not feel confident that as many nursing students should administer medications as compared with pre-survey results that did not indicate a concern about limited students administering medications. This suggests that knowledge shared in the seminar about safe medication administration may have led experienced faculty to re-evaluate their confidence in the number of students who can safely administer medications during one clinical day.

The capstone project revealed that nursing faculty indicated positive changes in knowledge and confidence from the pre-survey to post-survey results in relation to safe medication practices. This would indicate that learning took place in the safe medication practices seminar and with the medication administration toolkit. This capstone project provided evidence-based practice to support faculty and nursing students with medication administration in the simulation and clinical environments. The use of a Medication Administration Toolkit and Safe Medication Practices seminar provided nursing faculty with valuable pedagogical means of teaching medication administration to nursing students thorough out their pre-licensure experience. The conceptual framework of Bandura's Social Learning theory guided this capstone project and reflects remarks of Krautscheid et al. (2011), that nursing faculty need role-modeling, peer-learning, and opportunities for rehearsal. Nursing faculty should also utilize information about how to manage alerts, distractions, and work with technology related to safe medication administration, such as BCMA and EMR.

Participants in the project had a free-text question in the post-survey to address the benefit and knowledge of the MAT and SMP seminar. The participants were

encouraged in the pre-survey and post-survey to give feedback. This capstone project was successful and the medication administration tool-kit will be made available as part of the orientation process for clinical faculty. Based on nursing faculty feedback, an online electronic version of the toolkit will be considered as an alternative format for clinical nursing faculty. In addition, as a result of the seminar and discussion, the department chairs at this college are beginning a system of having fewer students in each clinical group beginning in the Fall of 2013.

Limitations

The capstone project was limited to a convenience sample of faculty at one rural university setting and may not be generalizable to other settings. All nursing faculty were from a pre-licensure nursing program that offered a baccalaureate degree. Faculty in an Associate Degree program or other Baccalaureate nursing programs may have different perceptions of knowledge and confidence while assisting nursing students with the medication administration process.

An additional limitation was that the sample size was relatively small. However the sample sizes of nursing faculty (n=26) group were adequate to accurately describe population perceptions of knowledge and confidence. The small sample size of faculty may have introduced selection bias, secondary to underrepresentation of this segment of the population.

As another limitation, the survey tools had been reviewed for clarity and understanding, but its reliability and validity had not been established (Burns & Grove, 2007). The project administrator had an established relationship with most of the nursing faculty who participated in the seminar. The relationship the project administrator with

some of the participants could have skewed the ratings toward a higher rating of agreeing with increased knowledge and confidence after attending the safe medication practices seminar.

Delimitations

A delimitation of the capstone project was the planned restriction of other nursing schools participating in this capstone project. This was necessary due to time constraints and lack of resources to include more nursing faculty.

Recommendations and Future Implications for Nursing Education

Capstone project findings also provided insight and further discussions needed to determine how many nursing students should be allowed to administer medications to assure patient safety and increase faculty confidence with the medication administration process. Faculty awareness of safe medication administration practices that foster confidence and increased knowledge of evidence based practice could enhance their ability to assist and supervise nursing students with the medication administration process. The next step in this capstone project would be to examine other avenues for faculty to increase knowledge and confidence in the medication administration process. The following questions could be investigated to determine:

1. Do simulation scenarios involving safe medication practices increase confidence of nursing faculty and increase opportunities for nursing students to administer medications?
2. Does the use of simulated clinical experiences to administer medications increase knowledge of safe medication practices of nursing faculty as compared with traditional clinical experiences?

More studies and capstone projects documenting the learning outcomes and educational benefits of medication administration seminars and toolkits such as this one need to be conducted and implemented for nursing faculty teaching pre-licensure nursing students to fill the gaps in the literature. Additional studies should be conducted that compare the outcomes of various educational strategies to promote safe medication practices among nursing faculty teaching in schools and colleges of nursing.

Summary and Conclusion

In conclusion, the project administrator examined if significant changes in knowledge and confidence improved with the use of a SMP seminar and MAT. Eighty percent of the nursing faculty indicated their knowledge and confidence improved with the use of the seminar and toolkit. Therefore, the use of a safe medication practices seminar and medication administration toolkit did make a significant difference in the nursing faculty member knowledge and confidence. The benefits of using a medication administration seminar and toolkit are clearly documented as a result of this capstone project. Schools and colleges of nursing should further explore faculty opinions of how many nursing students can safely administer medications and continue to explore other avenues for assisting nursing students with the medication administration process.

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Appendix A

Pre-survey for Medication Administration Toolkit and Safe Medication Practices seminar

Project Administrator Sharon Cherry

1. How many years of clinical teaching experience as a faculty member do you have with teaching with pre-licensure nursing students?
 - a. None
 - b. Less than 1 year
 - c. 1-2 years
 - d. 3-4 years
 - e. 5-6 years
 - f. 7-8 years
 - g. 9-10 years
 - h. More than 10 years

2. What is your gender?
 - a. Male
 - b. Female

3. What is your age?
 - a. 25-30
 - b. 31-40
 - c. 41-50
 - d. 51-60
 - e. 61 or greater

4. What is your highest level of education?
 - a. BSN
 - b. MSN
 - c. Masters in another discipline
 - d. Doctorate in Nursing
 - e. Doctorate in another discipline

5. Which semester level nursing student do you teach in clinical related courses?
 - a. 1st Semester Junior
 - b. 2nd Semester Junior
 - c. 1st Semester Senior
 - d. 2nd Semester Senior
 - e. Teach both junior and senior clinical related courses

6. How many students can safely give medications on a clinical day?
 - a. 1-2
 - b. 3-4
 - c. 5-6
 - d. 7-8
 - e. 9-10

7. I am confident in what constitutes a medication error.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

8. I consider a potential medication error (those you prevented from occurring) as a student medication error.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

9. Having nursing students administer medications in a clinical simulation scenario increases opportunities for medication administration and decreases the risk of medication errors in the clinical care environment.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

10. I am confident with reporting medication errors and completing necessary forms when a student makes a medication error.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

11. I am familiar with high alert medications.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

12. I am familiar with the Institute of Safe Medication Practice Guidelines for nursing students.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
13. Nursing students should complete medication cards on the most frequently used medications on the assigned clinical unit to increase their opportunities for learning and to be prepared to administer medications to their assigned patients.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
14. Fewer students should be assigned to clinical groups to lessen the problem of potential medication errors.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
15. If you agree or strongly agree with the above question (# 14), what number of nursing students do you believe would be ideal to have in a clinical group on the same day?
- Less than 5
 - 6-7
 - 8-9
 - 10
16. The bar scanning medication technology impairs my ability to safely administer medications in a timely manner with multiple nursing students.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
 - Bar Scanning Medication Technology not applicable to clinical unit
17. The acuity level of assigned patients limits my ability to safely assist students with administering medications.
- strongly agree
 - agree
 - neutral
 - disagree

e. strongly disagree

18. In the clinical setting, I am confident in allowing a group of 10 students to administer medications during the same clinical day.

- a. strongly agree
- b. agree
- c. neutral
- d. disagree
- e. strongly disagree

19. Please add any other comments applicable to this survey.

Appendix B

Consent from National League of Nursing

From: Mary Anne Rizzolo [mrizzolo@NLN.ORG]
Sent: Wednesday, October 03, 2012 7:19 PM
To: Nasreen Ferdous; Cherry, Sharon
Subject: RE: Permission to use NLN Scenario template

Dear Ms. Cherry,

The simulation template download is available free from the NLN's Simulation Innovation Resource Center website (<http://sirc.nln.org>). From the homepage, look on the left side navigation bar for the area labeled "RESOURCES" and click on the 10th item in that section - "FREE simulation downloads." You are free to use it to create your scenarios. Just retain the copyright statement on the document.

I am delighted that you find the template useful and wish you good luck with your study.

Mary Anne Rizzolo, EdD, RN, FAAN, ANEF
Consultant, Professional Development
mrizzolo@nln.org
www.nln.org**From:** Nasreen Ferdous [nferdous@nln.org]

Appendix C

Email Permission to use Institute of Safe Medication Information in toolkit.

From: Rachel Cohen [rcohen@ismp.org]
Sent: Wednesday, February 29, 2012 2:37 PM
To: Cherry, Sharon
Subject: RE: Using ISMP Medication abbreviations and forms

Hi Sharon,

You can use those documents from our website as long as they are for educational purposes and are reproduced "as is".

Rachel

Appendix D

Post- Survey for Medication Administration Toolkit and Safe Medication Practices

Seminar

Project Administrator Sharon Cherry

1. How many years of clinical teaching experience as a faculty member do you have with working with nursing students?
 - a. None
 - b. Less than 1 year
 - c. 1-2 years
 - d. 3-4 years
 - e. 5-6 years
 - f. 7-8 years
 - g. 9-10 years
 - h. More than 10 years

2. What is your gender?
 - a. Male
 - b. Female

3. What is your age?
 - a. 25-30
 - b. 31-40
 - c. 41-50
 - d. 51-60
 - e. 61 or greater

4. What is your highest level of education?
 - a. BSN
 - b. MSN
 - c. Masters in another discipline
 - d. Doctorate in Nursing
 - e. Doctorate in another discipline

5. In your opinion, how many students can safely give medications on a clinical day?
 - a. 1-2
 - b. 3-4
 - c. 5-6
 - d. 7-8
 - e. 9-10

6. Which semester level nursing student do you teach in clinical related courses?
 - a. 1st Semester Junior
 - b. 2nd Semester Junior
 - c. 1st Semester Senior
 - d. 2nd Semester Senior
 - e. Teach both junior and senior clinical related courses

7. I feel confident in allowing a group of 10 students to administer medications during the same clinical day.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

8. I feel confident in what constitutes a medication error.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

9. I consider a potential medication error (those you prevented from occurring) as a student medication error.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

10. It is important to include medication administration in the clinical simulation scenario environment using high fidelity patient simulators.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

11. I am confident with reporting medication errors and completing necessary forms when a student makes a medication error?
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

12. I am familiar with high alert medications?
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
13. I am familiar with the Institute of Safe Medication Practice Guidelines for nursing students?
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
14. Nursing students should complete medication cards on the most frequently used medications on the assigned clinical unit to increase their opportunities for learning and to be prepared to administer medications to their assigned patients.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
15. Fewer students should be assigned to clinical groups to lessen the problem of potential medication errors.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree
16. If you answered agree or strongly agree for the above question # 15, what number of nursing students do you believe would be ideal to administer medications?
- Less than 5
 - 6-7
 - 8-9
 - 10
17. The 6 rights of medication administration need to be expanded for example, to include the right education and right monitoring/evaluation.
- strongly agree
 - agree
 - neutral
 - disagree
 - strongly disagree

18. The bar scanning medication technology impairs my ability to safely administer medications in a timely manner with multiple nursing students.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree
 - f. Bar Scanning Medication Administration Technology not applicable to clinical unit

19. The acuity level of assigned patients limits my ability to safely assist students to administer medications.
 - a. strongly agree
 - b. agree
 - c. neutral
 - d. disagree
 - e. strongly disagree

20. After having had access to the Medication Administration Toolkit and attending the Safe Medication Practices seminar which of the following statements best describe your confidence/knowledge level with medication administration and safe practices?
 - a. Improved
 - b. Stayed the same
 - c. Did not improve
 - d. Need more utilization of the Medication Administration Toolkit
 - e. Not sure

21. Please add any other comments about the toolkit and seminar in this section of the survey.