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Improving the Quality of Care in an Acute Care Facility Through Reeducating Nurses About Managing Central Lines

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Abstract

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MS, Walden University, 2008

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Project Submitted in Partial Fulfillment

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Abstract

Central line-associated bloodstream infections continue to be some of the most deadly hospital-associated infections in the United States. Guided by Lewin's change theory which focuses on prior learning, rejection, and replacement, the purpose of this study was to improve the quality of care patients receive in an acute care facility by reducing life threatening central line infections. The research question examined whether additional education using Venous Access Nurse (VAN) customized newsletters and manager coaching of nurses in an acute care setting would improve the quality of care for patients with central lines. This was a quantitative nonexperimental descriptive retrospective study using secondary analysis of a hospital dataset. This dataset included variables relating to nurse tenure and nurse performance after reeducation and coaching on managing central lines. Variables from 450 of 1,300 nurses were analyzed in the current study at a 750 bed system in a southwestern healthcare system in Florida. The pre and post audits consisting of contributing factors were obtained from the VAN audits and post audits consisting of contributing factors were obtained from the Van audits and were calculated with descriptive statistics. There were a decrease from 19.1% of the lines audited having 1 or more deviations from the guidelines to 3.5%. Nurses with 2 to 5 years of tenure had a greater number of deviations from the guidelines' standard for managing central lines as compared to staff with a lesser or greater amount of tenure. Positive social change implications include knowledge useful for staff nurse educators and other researchers who are searching for direction in improving health care associated infection rates to provide a better quality of life, decrease costs, and increase safety.

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Dedication

I dedicate my doctoral degree to my aunt, Vivian Geruschat, who passed away during my journey through this process in 2013. As she was transitioning to her new life she continued to encourage me to complete this degree as she was sure she would not witness me accomplish this goal. The continual support during her most difficult times inspired me to complete my degree.

Acknowledgments

I would like to thank my mentor Theresa Morrison for her guidance, knowledge, and resources throughout this Doctoral process. She is an expert in evidence-based practice and engages in research and systems improvement. Her assistance in my practicums allowed me to apply learned concepts into practice. The knowledge learned from her is immeasurable and has greatly impacted my thought process and my career.

The support and patience of my long time significant other Jerry who stood by me throughout the long hours of research and writing was endless. There is no doubt in my mind that without his continued tolerance and understanding I could not have completed this process. The journey to completing this doctorate degree has been long and overwhelming but rewarding. Thank you to everyone who has helped me and accompanied me in this endeavor.

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Section 1: Nature of the Project

Introduction

According to the Centers for Disease Control and Prevention (CDC; 2011), minimizing the risk for infection requires a balance between cost effectiveness and safety. New technology, knowledge, and infection control prevention measures change with time. Healthcare workers must monitor and evaluate care to ensure success of equalizing safety with cost effectiveness. A central line is an intravascular catheter that lies at or near the heart, or within one of the great vessels. Great vessels are identified as the aorta, pulmonary artery, superior vena cava, inferior vena cava, brachio-cephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, or common femoral veins (CDC, 2010).

Problem Statement

Central line-associated bloodstream infections (CLABSIs) continue to be some of the most deadly and costly hospital-associated infections in the United States. According to the Institute for Healthcare Improvement (IHI; 2013), there have been improvements over the last several decades resulting from improvements in managing these types of lines with a 58% decrease of incidences from 2001 to 2009. These infections are still occurring and are being found outside of the critical care areas (IHI, 2013). A CLABSI is a primary blood stream infection in a patient that has had a central line within a 48-hour period before the development of the blood stream infection (CDC, 2013). This is considered the eighth most frequent medical error and the second most expensive error, costing thousands of dollars per incident. Sixty-five CLABSIs in the last 3 years cost a

715-bed southwestern nonprofit health care system consisting of two facilities in Florida employing 3,900 people, an estimated $2,275,000 (Naples Community Hospital, 2013). This study was performed in an attempt to decrease central line infections in this system due to a higher than desired amount of central line infections.

Guidelines have been constructed with the goal of preventing CLABSIs. Insertion is only part of the process for preventing CLABSI infections. Healthcare personnel must be educated on indications pertaining to the purpose of central line insertion and maintenance to prevent infections (CDC, 2011). Continuing feedback and auditing are performance indicators that assist nurses to understand the evolution towards better care (Titler, 2010). The focus is on the improvement in the execution and reassurance that these lines are managed per guidelines.

Hand hygiene is essential to prevent central line infections as well as using certain personal protective equipment such as a large sterile drape, cap, gown, sterile gloves, and a mask. Standards of practice for maintaining central lines are recommended for those that care for the patient after the line is inserted. All nursing personnel managing central lines after the completion of the insertion process must maintain the recommended practices. Every registered nurse and licensed practical nurses has completed an 18 step computer-based training module on how to assess and dress central lines in this community healthcare system. The Venous Access Nurses' (VAN) weekly central line audits identified multiple deviations from established guidelines for managing central lines. These deviations are considered CLABSI contributing factors for the purpose of this study.

Surveillance of staff's documentation as well as patients contracting CLABSIs has been performed and data gathered. Staff found not in compliance with the required standard of care in documenting, managing the central line per guidelines caring for a patient who developed a CLABSI, received an additional customized educational newsletter specific to their educational need. This was to reiterate the proper procedure and documentation and decrease the risk of life threatening infections when managing central lines.

Purpose

The purpose of this study was to improve the quality of care patients receive in an acute care facility by reducing life threatening central line infections. There is a need for this study because infection in central lines is an important issue in hospitals today because of the possibility of bacteria being placed directly into the blood stream and causing a life threatening situation. According to Barnett, Graves, Rosenthal, Salomao, and Rangel-Frausto (2010), CLABSIs are blamed for long lengths of stay in the hospital, high hospital bills, and increased mortality and morbidity. According to the CDC (2013), a CLABSI can be a life threatening situation because of the bacteria that is placed directly in the blood stream with the placement of central lines. Those assisting in line placement must follow certain guidelines for insertion and maintenance using sterile technique to insure an infection does not occur. Maintenance of this line includes strict sterile technique during dressing changes.

Objectives

- To determine if reeducating staff from nurse manager's coaching on the proper management of central lines is effective as noted by the repeated VAN audits
- To determine if there will be a greater number of tenured nurses (greater than 5 years) identified, as compared to staff with a lesser amount of experience that are deviating from the guidelines standard for managing central lines.

Analysis performed at the end of the data collection period was used to identify specific CLABSI contributing factors. There were 15 contributing and additional factors (see Table 1 CLABSI Contributing Factors) in the primary study where it indicates whether these factors are present or absent.

Research Question

Nursing is a profession that requires staff to be flexible due to its continual changes and fundamental processes. Change includes all essential skills and processes such as transforming evidence-based practice of new knowledge into practice that will provide better care for patients (White & Dudley-Brown, 2012). Communication is essential in motivating others in a new direction and to prevent roadblocks toward a smooth transition in managing central lines using evidence based guidelines.

According to Fakih et al. (2012), educating nurses about proper central line insertion techniques was successful and has empowered nurses to speak up if they saw something being done that wasn't appropriate or put the patient at risk for infection.

Education and real-time feedback to nurses increases and sustains compliance with processes to reduce the risk of infection. The following research question was addressed in this study:

For nurses in an acute care setting, would additional education using Venous Access Nurse customized newsletters and manager coaching of staff improve quality of care in patients with central lines by eliminating the occurrence of a CLABSI developing for patients with central lines?

Significance

CLABSIs may result in severe injury or death to the patient. Health care facilities provide patients with the greatest risk for infections. Kusek (2012) stated that 5-10% of patients admitted to the hospital every year are affected; CLABSIs are the most costly of all the healthcare associated infections. These infections add an additional cost of $45,814 on to the patient's bill, with the range of $30,919-$65,245 (Waknine, 2013), CLABSIs are avoidable if health care providers are compliant with evidenced-based guidelines in managing central lines (Kusek, 2013).

Reduction of Gaps

Preventing healthcare associated infections (HAIs) is a national priority "with initiatives led by healthcare organizations, professional associations, government and accrediting agencies, legislators, regulators, payers, and consumer advocacy groups" (Cardo et al., 2010, p. 1101). Research is needed to increase a partial understanding of the simple epidemiology of healthcare-associated pathogens, finding possible interventions, developing evidence-based guidelines into practices, and evaluating health outcomes of

nursing's health practices. There is a gap concerning deviations in the management of central lines that impact the prevention of central line infections and reeducating staff to ensure the consistent safe delivery of care decreases the possibility of acquiring central line associated infections. This facility's guidelines were a direct result of the CDC's recommendation on managing central lines (Association of Professionals in Infection Control and Epidemiology, 2009).

Social Change Implications

In this study, the significant societal change is reeducating nurses about managing central lines; this has an impact on preventing central lines infections by following the selected guidelines. These guidelines were derived from the CDC (2011). Reeducating or reminding staff nurses to follow these instructions can potentially save time, money and lives.

Defining Terms

Nursing tenure: The number of years working in the facility. Nurses fell into three categories: less than 2 years, 2 to 5 years, and greater than 5 years.

Central line associated bloodstream infections (CLABSIs): A primary blood stream infection in a patient that has had a central line within a 48-hour period before the development of the blood stream infection. It results when a patient develops a bloodstream infection after having a central line placed and the infection can be shown to be unrelated to any other factor (CDC, 2013).

Electronic medical record (EMR): A digital version of a paper chart that contains all of a patient's medical history.

Clinical Nurse Specialist (CNS): An expert clinician who works in a specialized area of nursing practice.

Healthcare-associated infections (HAIs): Infections that patients acquire while receiving treatment for medical or surgical conditions.

Central venous catheters (CVC): Medical devices inserted into the central venous circulation using a subclavian or internal jugular vein, including, but not limited to peripherally-inserted central catheters (PICC) and implantable venous access lines.

An internal jugular (IJ): A large bore catheter often used for dialysis. A central line is an intravascular catheter that lies at or near the heart, or within one of the great vessels. Great vessels are identified as the aorta, pulmonary artery, superior vena cava, inferior vena cava, brachio-cephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, or common femoral veins (CDC, 2010).

Computer-based training (CBT) course: Information provided to staff by the computer.

Venous Access Nurse (VAN): A nurse employed in Naples Community Hospital (NCH) to insert PICC lines and conduct weekly audits visually assessing all central lines and dressings.

CLABSI contributing factors: Fifteen specific items, divided in to three types of factors that include documentation, dressing, and tubing related issues.

Noncompliance: Nurses not following the established guidelines of managing central lines.

Deviation: Indicates a part of the established guidelines has not been followed by the nurse managing the patients' central line.

Limitations

A limitation in using secondary data is that a researcher does not know how the data collection process was performed and if it was performed adequately, as in this study. Rater bias by individual VANs and possible variation in the method of data being collected and documented by each VAN is a valid concern. In most cases, the researcher usually does not have knowledge about how seriously the data are affected by problems noted by original researchers. It is important for a researcher to consider any difficulties encountered during the process of collecting data (Johnson, 2013).

Summary

There is a need to decrease or eliminate infections associated with lines placed in patients during their stay in the hospital. This study was needed because healthcare executives, physicians, and nurses who are involved in direct and indirect patient care need reliable information regarding how surveillance and therapeutic processes can affect CLABSI rates.

The fact remains that it is very costly financially for the healthcare facility and patient due to the possibility of sepsis, multisystem failure or even death. This impact affects the family and loved ones, which can be devastating to those involved so discovering ways to prevent these infections is imperative. Realizing how many staff members are involved in incorrectly managing or documenting central lines has assisted in the quality improvement initiative of this study. Educating staff in evidence-based

management techniques for central lines can contribute to a decrease in central line associated blood stream infections in acute care patients.

Chapter 2 is a review of the relevant literature. Chapter 3 is an explanation of the methodology used for this study. Chapter 4 is a report of the results and Chapter 5 is a publishable dissemination of the results.

Section 2: Review of Literature and Theoretical and Conceptual Framework

Introduction

The purpose of this study is to improve the quality of care patients receive in an acute care facility by reducing life threatening central line infections. The significance of the issue of these infections consists of the possibility of severe injury or death to the patient. I evaluated literature for usefulness with respect to the problem of nurses not complying with following the established guidelines for central line management. These articles included information on verifying the importance of guidelines and the reasons staff would have issues with compliance.

Teaching Hospitals

Knops et al. (2010) performed a study in a teaching hospital involving nurses from seven wards. Knops et al. wanted to find out if adherence to two hospital guidelines was sustained over a long period of time while exploring factors accounting for adherence or nonadherence. A questionnaire was administered during a staff meeting as well as e-mailed to those who did not attend, comprising of seven factors involved in preventing adherence of guidelines. All subjects were randomly selected. The theoretic framework was made up of five levels of obstacles in motivations for change. Seven years after the execution of these facilities' guidelines, researchers concluded that there was 100% adherence. Factors contributing to adherence included the direct advantages to apply the guidelines and the collaboration of nurses.

Vaismoradi, Salsali, and Ahmadi (2011) described a qualitative descriptive study of nurses' uncertainty of experiences in their practice of caring for medical and surgical

patients. Vaismoradi et al. conducted interviews that were semistructured and completed with 18 female bachelors of science-prepared nurses employed in a teaching hospital. Content analysis identified three main themes. These themes were "compatibility with uncertainty, psychological reactions to uncertainty, and unclear domain of practice" (Vaismoradi et al., 2011, p. 1). Vaismoradi et al. concluded improving nursing work environments could enhance staff's preparedness of uncertainty in the workplace and increase the quality of care to patients. This study helped managers educate and prepare nurses for uncertain situations in practice.

Guidelines

Bahtsevani, Willman, Stoltz, and Ostman, (2010) described clinical practice guidelines (CPGs) as providing reliable routines for all staff members to provide safer and better patient care. The method used by these authors was qualitative which included a questionnaire survey given to managers who were responsible for quality assurance. The questionnaire described actual implementation and use of CPGs. Results included that most managers had a positive attitude toward CPGs; concerns included having too many CPGs that could possibly lead to stagnation of critical thinking in staff nurses. The theme was a continual process of producing reliable and tenable routines involving all staff which leads to the expectation of better and safer care of the patient. The conclusion includes the recommendation that CPGs should be an integral part of practice and quality assurance for successful reliability of routines for staff, thereby increasing knowledge and confidence.

Gurses et al. (2011) investigated compliance of the use of evidence-based guidelines in practice due to their importance in patient care. This was a qualitative study to assess the causes of noncompliance of following guidelines created to prevent four different types of HAIs in an intensive care unit. Gurses et al. conducted 20 semistructured interviews with multidisciplinary professionals in the intensive care unit. Themes from the interviews included compliance, which was being hindered due to responsibilities, tasks, and expectations. Causes of noncompliance can be attributed to ambiguity of guidelines with the goal of reducing central line infections.

Evidence-Based Practices

Dalheim, Harthug, Nilsen, and Nortved (2012) investigated contributing factors that encouraged implementation of evidence-based practices (EBP). This was a cross-sectional study of 407 nurses gathering information used to support practice and potential barriers including self-reported skills for managing research-based evidence. The "staff's age, years of experience and number of years since obtaining the last health professional degree influenced sources of knowledge and self-reported barriers" (., 2012, p. 1). Dalheim et al. appeared to prove EBP reduced obstacles in using research evidence and increased use of research evidence in clinical practice.

Clancy (2010) declared HAIs as preventable and confirmed if evidence-based practice is utilized, then the numbers of infections are decreased significantly. This was a keystone study that assisted intensive care units in Michigan to reduce CLABSIs over a period of 3 years. It was funded through a grant by the Agency for Healthcare Research and Quality (AHRQ). A program was instituted and named the CUSP.

There are five steps in the program that include staff being educated on the science of safety training. A written survey is used by staff to identify defects in unit reports, liability claims and sentinel events (Clancy, 2010). An executive administrator, partnering with a particular unit, could improve communication and act as a liaison between leadership and staff. Staff will learn from the use of videos and presentation slides to improve teamwork and communication. Clancy (2010) suggested that infections can be prevented when nurses and other vital members of the care team own the responsibility of managing central lines.

There are three objectives to the report from Rizzo (2005) that included providing a concise summary of current mandatory reporting legislation on nosocomial infections. Identifying and summarizing EBP safety practices shown to reduce catheter-related bloodstream infections demonstrated the cost-benefit hospitals achieved by undertaking infection-reducing programs. The main safety goal of several agencies such as the Institute for Healthcare Improvement (IHI), the Joint Commission (TJC) and the AHRQ was to reduce catheter-related bloodstream infections (Rizzo, 2005). There seems to be no link that exists connecting public reporting and a reduction in hospital-acquired infections. However, mandatory reporting is being implemented to reduce these types of infections and is the law in six states currently including Illinois, Florida, Pennsylvania, Missouri, Nevada, and Virginia.

The research on preventing bloodstream infections includes using the most sterile barriers as possible during placement of lines. Utilizing an antiseptic on the patient's skin before insertion, washing hands as required, and using the appropriate insertion site

decreases the risk for developing infections, as well as developing and implementing education and training programs for staff to review when managing central lines (Rizzo, 2005). Creating an intravenous team to solely manage central lines and only use antimicrobial-impregnated catheters is another way to decrease patient's risk of infections. Contamination of the hubs of the catheters by healthcare workers is the most common source of infection. The use of a skin antiseptic, such as chlorhexidine, has a 49% reduction in central line infection rates (Rizzo, 2005). Educating staff on the proper care of a central line decreased central line infections by 67% following the training program. The most common antibiotics used for central line infections were rifampin and minocycline which are systemic thus raising the concern for drug resistance (Rizzo, 2005).

Gerrish et al. (2010) identified factors influencing advanced practice nurses' contribution to promoting EPB among front line nurses. Nurses felt there were challenges in implementing EBPs even though they recognized their care should follow EBP research. A cross-sectional survey was conducted with 855 advanced practice nurses in 87 hospital settings in England (Gerrish et al., 2010). The survey was used to examine staff's understanding of EBP, sources of evidence used, and ways of working with these nurses, perceived impact on front line nurses, skills in EBP, and barriers to promoting EBP. Quantitative, descriptive statistics were utilized in analyzing data including a comparison of nurses with multiple degree preparations. Gerrish et al. concluded that nurses that were master's degree prepared had a positive impact in the EBP arena due to their increased education and knowledge of EBP.

Infections

Casey and Elliott (2009) believed that the leading causes of central line infections are preventable due to the implementation of care bundles to manage central lines. Coagulase-negative staphylococci noted to be on the majority of the patients' skin in this study and determined to be the most common cause of central venous line infections (Casey & Elliott, 2009).

Several catheter types were evaluated and assessed for the associated risk of infection; these catheter types included nontunneled CVCs, pulmonary artery catheters, peripherally inserted CVCs, and tunneled CVCs and implantable CVCs. The catheter that had the best results was the single lumen antimicrobial-impregnated catheter of one to three weeks placed in the subclavian or IJ site (Casey & Elliott, 2009). Chlorhexidine gluconate 2% in 70% isopropyl alcohol was also used and allowed to dry, in preparation of the skin. Hand hygiene and personal protective equipment including gown, gloves and mask for aseptic technique were utilized for placement and changing of the dressing. The dressing itself consisted of a sterile transparent dressing to allow visual observation of the site that was dated and recorded in the patient's EMR (Casey & Elliott, 2009). Daily observation of the site performance and the dressing was ensured to be fully intact at all times, with injection ports covered by caps, and finally when catheters no longer needed for clinical care delivery, it was ensured discontinuation of the tube occurred (Casey & Elliott, 2009).

Kuehn (2012) introduced a program called CUSP in an attempt to stop hospital-acquired infections. This program empowers nurses to identify and fix problems

immediately that may interfere with patient safety. In a 4-year period, CUSP has been initiated in 1100 intensive care units across the country. Analysis of preliminary data suggested that the effort has cut the rate of CLABSIs nationally by 40%, reducing the rate of infections per 1000 central line days from 1.9 to 1.1 (Kuehn, 2012). The program has prevented 2000 infections, saved 500 lives, and accomplished these outcomes at a saved cost of $34 million. The latest results come from a 4-year effort to roll out the program in 44 states (Kuehn, 2012).

Theoretical Framework

While there are several nursing theories that would support this project, Lewin's (2013) change theory is most applicable. This model of change shows the process as it happens in human beings. It is a three-stage model known as the unfreezing-change-refreeze model (Lewin, 2013) which involves prior learning to be rejected and replaced. There is a direct application to this study as the staff will release previously learned behavior, understand the expectation of them, and continue with that new learned behavior when managing central lines and completing relevant documentation. Behavior is thought to be a balance of forces that work in opposite directions (Lewin, 2013). Performance indicators include feedback and auditing on an ongoing basis which will help nurses recognize the progression of improved care and positive outcomes (Titler, 2010).

Summary

Through the review of literature, I demonstrated that there is a need to decrease and ideally eliminate infections associated with lines placed in patients during their stay

in the hospital. This study was needed because healthcare executives, physicians, and nurses who are involved in direct and indirect patient care need reliable information regarding how surveillance and therapeutic processes can affect CLABSI rates. Chapter 3 is an explanation of the methodology used in this study.

Section 3: Methodology

Design

The design is a secondary analysis of an ongoing quantitative study. This means that data that have already been collected by one person or group are repurposed and reanalyzed by another person or group to answer a new research question (Polit & Beck, 2004). Variables in the primary quantitative study, which permits a researcher to institute correlations and relationships between the variables, consist of multiple CLABSI contributing factors (Terry, 2012). Using secondary data analysis saves time, especially in quantitative data, while providing large databases of higher quality which could not be collected on one's own. The benefits of using this type of analysis is time efficiency, decreased effort, and increased potential cost savings which must be weighed against limitations of the level of data (Smith et al., 2011). I used secondary analysis in this study.

Assessing statistics and testing the theory can lead to logical outcomes. This study is a nonexperimental design as there is research lacking manipulation of the independent variable. I identified what has occurred and how the variables are related. Nonexperimental research works well in education studies because it lacks manipulation of the independent variable.

The design is descriptive and describes phenomena. Descriptive designs have a statistical nature to describe current characteristics such as frequency, percentages, and averages and are most important in the early stages of the investigation. I used frequency and percentages to test for deviations of observed frequencies from expected frequencies.

In this study, I also noted which group of the nurses' tenure had the greatest number of deviations.

Quality Improvement

The EBP model that supports this study is quality improvement. This continual improvement process produces change and is as important as focusing on high quality and evidence-based care. Initiatives on health promotion include adherence and a support system to assist the nurse (Zaccagnini & White, 2009). Quality improvement is a continual process where evidence, nursing theory, and the researcher's clinical expertise are evaluated critically while involving the patient in order to provide the best possible care for the patient (Scott & McSherry, 2009).

Listed in Table 1 are the Noncompliance of CLABSI guidelines which are defined as deviations and the specific deviation. The distinct relationship between these variables in the research question was defined by clinical and managerial values. The use of quantitative research provides an opportunity for a researcher to gather information in a manner that allows for statistical analysis. Quantitative researchers attempt to remove all subjectivity from a study by carefully planning and minimizing midstream deviations in the primary research study.

Approach

According to one of several Joint Commission (2012) recommendations of safety goals for 2013, it is necessary to implement EBPs to prevent central line-associated bloodstream infections. The objectives for the project align with staff's practice of the National Patient Safety Goal (NPSG) recommendation 07.04.01. This goal recommended

incorporating preventative CLABSI management into practice, implementing EBPs to prevent CLABSIs, as well as examining and discriminating noncompliant and compliant dressings (The Joint Commission, 2012).

The project also included short and long term CVC and PICC lines. The recommendation is to educate staff members and licensed independent practitioners involved in managing central lines to prevent CLABSIs from occurring. The original education process occurs upon hire, and I will recommend additional education on a yearly basis. There is also a need for patients and families to be educated on managing central lines and the care and safety measures required to prevent infection. Implementation of policies and practices which focus towards decreasing the risk of CLABSIs aligns with evidence-based standards retrieved from organizations such as the CDC (2011). Assessments for risk of CLABSI must be monitored utilizing EBPs and the effectiveness of the prevention efforts.

The purpose of the original CBT course required every newly hired licensed practice nurse (LPN) and registered nurse (RN) to view how to manage central lines and extended indwelling catheters at this healthcare system with this practice continuing today. The course consists of four sections with a posttest. The first lesson in the CBT is an overview of central lines including their purpose and including pictures to demonstrate their appearance. The second lesson pertains to changing central line dressings and includes 18 steps with pictures to assist the learner on the correct way to perform this task. The third lesson is on management of the lines that are connected to the central line.

The final lesson educates the learner on documentation of the central line, dressing and line changes.

These lessons are placed in each employee's on-line education called Health Stream Learning Center so staff can access this information when time permits. After completion, the employee can review the completed content at any time. Even after the education of staff, CLABSIs continued in this facility.

A primary study was conducted to find the rate of infections and the unit that had the most prevalent infections. An educational newsletter specific to the found deviation defined as nonconformity of the established guidelines guideline through this study was constructed. The secondary analysis defined additional education in the form of a newsletter developed by the CNS and delivered to the unit manager to provide to the staff member who was identified through the audit, along with coaching, was effective in decreasing CLABSI deviations. Also included is the experience of the nurse who deviated from the guidelines established in the CBT called 2013 CLABSI. The secondary study showed that yearly educational reinforcement of managing central lines can occur through yearly mandatory skills fairs.

Population

According to the Health Resources & Service Administration (HRSA; n.d.), 2.8 million RNs and 690,000 LPNs are actively working in the nursing workforce. Although practicing nurses under the age of 30 has increased, 33% of the nursing workforce is older than 50, and the largest age group of nurses is 41 to 50 years of age (HRSA, n.d.).

The population involved in this study was the nursing staff consisting of over 1300 members at one southwestern healthcare system consisting of two facilities in Florida. The differences of employment in staff includes full time, part time, seasonal, and nurses required to work two shifts a month to manage central lines. The VAN audit suggested a deviation in this process and was identified as a CLABSI Contributing Factor in the primary study. The nurses were identified in the primary study through their employee number. I was provided de-identified employee numbers for use in this study.

There were no patients involved in the study. There was no personal information used from any patient other than the fact they had a central line during their hospitalization. Data from the patients' medical record, including sex, age, or even reason for the central line, are irrelevant in the collection of data for the study. The study pertains to data collected before and after the reeducation CNS-developed newsletters were administered to staff by hand delivery by the unit's manager, along with coaching, for use in the secondary study.

The original data collection was performed and completed by one of the VANs who rounded weekly and assessed every line existing within two facilities. This auditing process is in place in part due to the recommendation from the Joint Commission to monitor central lines. The VAN sent a list of central lines found to have a deviation to the Clinical Nurse Specialist, who then subsequently collected data from the patients' charts in order to find the specific deviation involved in the managing of central lines. The CNS prepared a newsletter after investigating the specific deviation found in the medical record and sent it to the manager who hand delivered the newsletter to the identified staff

member and coached the staff member on the deviation. VANs utilized a checklist of certain factors to assess and clarify any deviating factors that were not in line with the guidelines for managing lines.

The primary study performed by Theresa Morrison Ph.D. in 2014 utilized the nurse's employee number to identify their unit and manager. The secondary study's analysis included management of the dressing, lines, completion of the required documentation and years of service. The staff was given a customized newsletter from their managers in a face-to-face meeting where the employee experienced a coaching session and had to reread the part of the guidelines pertaining to their deviation. Secondary research included collecting the data from the original research to see if reeducating staff was effective in preventing central line infections. Data were placed into an Excel spreadsheet from which analysis occurred. According to the National Institute of Health (2013), ethical issues surrounding potential sources of data collection include (a) protection from harm, (b) right to privacy, (c) informed consent with ethical considerations, (d) honesty with professional colleagues.

In the use of secondary data for this study, the ethical concern related to the study is the issue of privacy and confidentiality. I addressed these concerns by only using de-identified data and a sample size of over 450 staff nurses and over 200 patients with central lines using a randomization methodology. A secondary analysis performed under guidance of the Internal Review Board (IRB) and a professional code of ethics of a doctoral student who is also a healthcare professional. The Health Insurance Portability and Accountability Act (HIPAA) of 1996 observed and utilized in accordance with

federal law. HIPAA is a federal rule that provides privacy and security safeguards for the protection of the patient's private and confidential information (HHS, 2013). The staff was protected due to their employee number being de-identified in the secondary study. The provided data did not have any identifying markers that would indicate who the recipient of care was. The implementation of HIPAA standards existed using de-identified data to assure compliance with the federal mandate. No vulnerable populations existed within the study. No physical control, coercion, undue influence, or manipulation of persons or data occurred. The study did not offer benefits, and no risks existed for organizations that provided data files for anyone whose information was contained within data files. The study received IRB approval number 09-10-14-0048306 at both Walden University and this southwestern healthcare system to assist in the oversight of the study and to assure proper precautions to prevent breaches in confidentiality were used.

Data Collection

The data collected from the primary study contained the 15 contributing factors gathered from the VAN audits. An available VAN nurse on staff performed the audits once a week every Thursday using an audit form that is more of a checklist that was constructed by the VAN nurse. The VAN audit was used to perform the original study of finding and identifying which particular component of the guidelines had a deviation. In this quantitative, nonexperimental descriptive retrospective study using secondary analysis, I used existing recorded data. Data collection often occurs as chart audits in hospitals because the data source is the patients' medical record.

In the case of the primary study, the data were collected from VAN's audits; VANs carried a clipboard, visited each patient with a central line, observed and recorded the site, dressing and intravenous (IV) tubing deviation from the guidelines. After the managers coached each nurse staff member identified as deviating from the guidelines for central line management and documentation, an attempt was made to evaluate if re-education improved documentation and management of central lines. The data available, when reviewed, allowed for the identification of a relationship between nurses' tenure and number of CLABSI contributing factors.

Data Analysis

Data analysis in this secondary study consisted of reliability, validity, and analytical techniques which included percentages and frequencies. Validity of research findings refers to the extent to which the findings are an accurate representation of the phenomena they are intended to represent (Anderson, 2010). The reliability of this study refers to the reproducibility of the findings. Validity was substantiated by the relationship between the cause and effect of this study. Contradictory evidence, often known as deviant cases, must be sought out, examined, and accounted for in the analysis to ensure that researcher bias did not interfere with or alter their perception of the data and any insights offered (Denzin & Patton, n.d.)

This project design did not manipulate any independent variables; however, it did identify occurrences and variable relationships. The design allowed for a large data set to describe a phenomenon in a statistical nature. Raw data were coded, de-identified,

imported, and analyzed using frequency and percentages for the primary and secondary study.

Quantitative designs usually pertain to health research methods related to human service disciplines. The research data were systematically obtained and organized, analyzed, and then interpreted. The central line was assessed by the VAN nurse who checked the dressing date, evidence of adherence to the skin, drainage, as well as the tubing with date and if it was capped appropriately if not in use. The CNS investigated the deviation as identified by the VAN nurses' audits. The specialist would then note the CLABSI contributing factor that was involved in the deviation from managing the central line and create a customized newsletter based on the original CBT module completed by all nurses upon hire.

The newsletter was given to the involved staff member's manager for coaching purposes of the specific deviation. Input of data from the primary study was placed on an Excel spreadsheet with the de-identified employee number which indicated the number of years of service in this facility, not the nurses' number of years in the profession. The nurses have had the required mandatory education on managing central lines when hired. However, some staff nurses were employed before mandatory training on central lines was introduced; those nurses viewed a CBT to introduce the guidelines policy to them.

Quantitative research is linear and deductive which allows for clearer and more concise management of data in the medical and healthcare environments. Healthcare disciplines rely upon quantitative research to enhance knowledge. Audits are performed by VANs by using a checklist on a clipboard; the checklist is then sent to the CNS. For

quantitative process in this project, I used percentages to analyze collected data. There are structured rules for the use of tests and interpretation of test results. After the data analysis, logical conclusions were drawn from the interpretation of the resulting numbers (Weisstein, n.d.). Data retrieved from the primary study included variables such as number of lines, number of noncompliance of documentation, type of line, which step was not followed in the management of the line, number of nurses involved, and years of experience in this facility over a span of time.

The secondary analysis data was collected into an Excel spreadsheet and calculated using frequency and percentages. A data analysis technique used is the frequency distribution which allowed for a visualization of the data. From this distribution, a visualization of how frequent certain values occurred and what the percentages were for the equal variables (Li, 2013).

Overall, HAIs are preventable by consistent adherence to evidence-based strategies and evidence that prevention strategies can be successful. CLABSIs are considered a significant cause of morbidity and mortality in hospitalized patients as evidenced by the literature presented in this proposal. In the perspective of this project, recommendations are strong for use of to use the approved proper guidelines empirically for managing central lines. As noted in this study, central lines are not just in the walls of critical care units and hospitals. Many central lines are currently being managed in outpatient facilities, especially in outpatient dialysis clinics.

Evaluation

The evaluation included analysis of skills and knowledge so that they are understood, validated, and can more consciously guide actions. This transformation theory is a guide to developing cognitive skills in an attempt to learn and overcome barriers to understanding. Evaluation of the secondary study implemented is crucial to ascertain its effectiveness or need for improvement. Theoretical evaluation is more valuable than empirical when doing quality improvement such as that discussed in this paper due to the basis of the intervention answering the question of how it works. A summative evaluation plan determines whether a program is working after the research is complete, and the goal met. This evaluation plan provides a better understanding of the process of change and finding what worked in the program. The plan would work well in assessing this secondary project because after the analysis was completed, it indicated the goal was achieved. The goal was reeducating nurses to assist them in following the select guidelines for managing central lines to prevent any chance of infection that would be very costly in time, money and risk of life. For this study, secondary analysis was used to determine if reeducating staff on the proper way to manage and document central lines by utilizing the newsletter and manager coaching is effective. Data were analyzed on the impact of staff nurses' years of tenure to the number of deviations found.

The evaluation of five randomly selected weeks from June 2014-August 2014, after nurses were reeducated, concluded that there was a decrease in deviations from the CLABSI guidelines as noted in the VAN audits. Poor communication can inhibit implementation of this process, so it's imperative to keep staff informed of expectations

and the purpose of the skill that is being asked of them (Johnson, 2013). Resolving difficulties of managing central lines for patients saves money, decreases lengths of stay and increases the safety of patients admitted into an acute care facility. Early assessment and proper treatment can prevent complications and improve patient outcomes (Dasta, McLaughlin, Mody, & Piech, 2005).

Summary

The evaluation process was used for this study to answer the question if reeducating and manager coaching of staff nurses decreases the incidence of noncompliance with evidence-based practice standards including established CLABSI prevention guidelines. Secondary analysis of data collected over a random 5-week period and analyzed gives an accurate indication if this is a valid observation.

Section 4: Findings, Discussion, and Implications

Summary and Evaluation of Findings

The purpose of this study was to improve the quality of care patients receive in an acute care facility by reducing life threatening central line infections. The first objective was to determine if reeducating staff from nurse manager's coaching on the proper management of central lines is effective as noted by the repeated VAN audits. The second objective was to determine if there will be a greater number of tenured nurses (more than 5 years) identified, as compared to staff with a lesser amount of experience that are deviating from the guidelines standard for managing central lines.

The primary study was conducted over a 16-week period, from October 2013 to January 2014. Data collected indicated there were 627 lines audited on 18 nursing units for deviations on managing central lines. The 15 compliance issues known as contributing factors are divided into three types: (a) dressing related, (b) IV tubing administration set related, and (c) documentation related (Table 1). About 19.1% of the lines audited had one or more issues of noncompliance. Documentation related factors presented the most prevalent issue of noncompliance with 53.7 % of audited lines having at least one issue in this category. The second most frequent category of problems with compliance was IV tubing administration set related; 27.5% had at least one deficiency in this area. Only 18.6% of the central lines had problems in the dressing related category.

Table 1

CLABSI Contributing Factors That the VANs Determine is a Deviation From the Guidelines

Types of Compliance Issues	
Dressing Related:	
	Dressing nonocclusive or bloody
	Dressing Date Missing
	CHG impregnated disk saturated
Tubing related:	
	No alcohol impregnated caps
	Blood in Connector
	Tubing missing or Date Incorrect
	No male and female luer cap
	Tubing Looped
Documentation related:	
	No documentation at all
	Patency issue without resolution
	Incorrect lumen documented
	Incorrect documentation dressing date
	Dressing changed <7 days no reason documented
	Dressing/port needle not changed >7 days
	Connector changed <3 days no reason documented

The secondary study performed by Theresa Morrison Ph.D. in 2014 indicated that after reeducating nurses on the guidelines for managing central lines, deviations dropped from 19.1% to 3.5%. Data consisted of two dressings, five tubing and seven documentation deviations. The secondary study's results were obtained and analyzed several months after the primary study's completion. The selected evaluation time frame was 5 random weeks after the conclusion of the primary study and was between June and August of 2014. In this 5-week period after the reeducation process, there were 14 deviations. Data consisted of two dressings, five tubing and seven documentation deviations. Audited lines were 168 on 18 nursing units with 14 deviations from the guidelines. About 3.5% of central lines had a deviation found through the VAN audit.

In the primary study, 627 lines were audited on 18 nursing units for deviations on managing central lines. About 19.1% of the lines audited had one or more deviations. Data from several months later, after nurse's reeducation, were collected during 5 randomly selected weeks from June 2014-August 29014. These results, from 168 lines audited on 18 nursing units were 3.5% of the lines audited had one of more deviations (Table 3). At the conclusion of the primary study, the total number of found deviations was 621 of 627 total lines and 120 lines with deviations or 19.1%. There were 116 dressing deviations calculated as 18.5% of 621 total deviations. There were 171 tubing deviations calculated as 27% of 621 total deviations. There were 334 documentation deviations calculated as 53.3% of 621 total deviations.

In the secondary study the total number of found deviations was 14 of 168 total lines and six lines with 14 deviations or 3.5%. There were two dressing deviations calculated as 14.2% of 14 total deviations. There were five tubing deviations calculated as 35.7% of 14 total deviations. There were seven documentation deviations calculated as 50% of 14 total deviations.

In the primary study, there were 495 nurses involved in deviations of managing central lines. Several months after the primary study was completed and nurses were reeducated and data collected during 5 randomly selected weeks from June 2014-August 2014, there were 11 nurses involved in deviations of nurses managing central lines. The primary study indicated there were 150 nurses with fewer than 2 years of experience involved in central line deviations or 30% of 495 total nurses. There were 234 nurses with 2-5 years of experience involved in central line deviations or 47.6% of 495 total nurses. There were 111 nurses with greater than 5 years of experience involved in central line deviations or 22.4%.

Results of the secondary study indicated there were two nurses with less than 2 years of experience involved in central line deviations or 18.1% of 11 total nurses. There were six nurses with 2-5 years of experience involved in central line deviations or 54.5% of 11 total nurses. There were three nurses with greater than 5 years of experience involved in central line deviations or 27.2% (Table 3).

In the primary study, there were 495 instances of individual nurses involved in deviations from the guidelines on managing central lines. These nurses were not counted twice in the study as confirmed by their employee number and results of the number of

nurses were given to this researcher. Nurses with fewer than 2 years of tenure involved in line deviations was 151 or 30.3%, nurses with 2 to 5 years of tenure was 236 or 47.2%, and nurse with greater than 5 years tenure was 113 or 22.4%. Nurses with 2 to 5 years of tenure at this Southwestern Florida health system had the greatest number of deviations in managing central lines. The tenure of nurses is for this system only; the nurse could have many more years of experience in their profession; but, for the purpose of this study, only the years of tenure in this system was calculated.

The result of the secondary study I performed found reeducating nurses was effective as noted by a decrease in deviations recorded on the VAN audits and data displayed in frequency and percentages. I chose to find the tenure of nurses who have the greatest deviations.

Reeducating staff nurses in the management of central lines decreased deviations in the documentation and guidelines adherence. Findings for the second objective determined there is a greater number of tenured nurses with 2 to 5 years of tenure identified, as compared to staff with a lesser amount of experience or greater amount of experience that are deviating from the guidelines standard for managing central lines. This is a difference from the study's objective stating that the expected deviations would be greater in nurses with longer tenure. I expected the longer tenured nurses to have more deviations due to the length of time from originally being educated on the guidelines of managing central lines.

Data concluded after the primary study was concluded that documentation was the most frequent deviation followed by tubing and then dressing deviations. Although

this remained the same at the conclusion of the secondary study, the frequency of the occurrences had decreased. Nurses with 2-5 years of tenure had the highest frequency of being involved in deviations on managing central lines after the study was completed.

Discussion of Findings in the Framework

Lewin's (2013) theory of change supports this study. After the nurses were reeducated on managing central lines there was a decrease in deviations. The three-stage model known as the unfreezing-change-refreeze model (Lewin, 2013) involves prior learning to be rejected and replaced. There is a direct application to this study as the staff has released previously learned behavior, understand the expectation of them, and continue with that new learned behavior when managing central lines and completing relevant documentation (Lewin, 2013).

Impact on Practice

CVCs are crucial in today's health care for a variety of reasons. Eliminating the use of these lines is not feasible. Their use for hemodynamically monitoring, hemodialysis, providing nutrients, fluid, and blood is mandatory. More than 150 million different types of intravascular devices are used each year for short term or long term purposes (Han, Liang, & Marschall, 2010). Central lines are becoming more frequently used outside of the ICUs and associated with financial costs linked with infections in addition to morbidity and mortality from these infections. Treatments, extended hospital stays, and less to no reimbursement by third-party payers for expenses can have devastating financial consequences for health care facilities.

CLABSIs are the most common cause of HAIs. An estimated 80,000 catheter-related bloodstream infections found in the United States are caused from central venous catheters (CDC, 2011). There are close to 41,000 CLABSIs in acute care hospitals every year, and 18,000 of those are from patients who are admitted to the intensive care units. However, approximately 23,000 infections were noted from patients in outpatient areas (CDC, 2011). The number of patients receiving hemodialysis treatment in an outpatient setting contracting a CLABSI was 37,000 across the country. CLABSIs lead to longer lengths of hospital stay and one in four patients die from this infection every year (CDC, 2011).

Through the years, many interventions have been introduced to prevent central line infections. Interventions include bundles, different sites, certain skin antisepsis, specific catheters including those impregnated with antibiotics, number of days used before the recommended change, different sites, and multilumen versus single lumen catheters (CDPH, 2013). Many different strategies have been used in the past; but, there has not been a study on reeducating the nursing staff and assessing their knowledge on managing central lines.

Implications from this study include stakeholders paying attention to the results of this study. It is a significant issue that nurses deviate from the guidelines procedure to manage lines appropriately per policy of the facility. In this facility, the guidelines found on computer-based training may have to occur every year due to the study's finding that reeducating staff has decreased deviations in managing lines. Reeducation will increase

the knowledge of nurse's EBP, while having a positive effect on the staff and ultimately on the safe care of the population of patients that have central lines inserted.

The 5 weeks after the reeducation process, data consisted of two dressings, five tubing and seven documentation deviations. Audited lines were 168 on 18 nursing units with 14 deviations from the guidelines. About 8.3 % of central lines had a deviation found through the VAN audit. In the primary study, 627 lines were audited on 18 nursing units for deviations on managing central lines. About 19.1% of the lines audited had one or more issues found in noncompliance.

Nurses with less than 2 years of tenure involved in line deviations was 151 or 30.3%, nurses with 2 to 5 years of tenure was 236 or 47.2%, and nurse with greater than 5 years tenure was 113 or 22.4%. Nurses with 2 to 5 years of tenure at this Southwestern Florida health system have the greatest number of deviations in managing central lines.

Results of this study demonstrated that this simple, inexpensive intervention of reeducating nurses on the guidelines may be a way to save money, time, and patients' lives. Future researchers could show which deviation is most frequent and which unit has the most deviations. It would be of value to patients to have the nurses review the guidelines on managing central lines on a regular basis.

Impact for Future Research

This study can be the first in a line of studies with the goal of preventing infections or harm to patients. There are several different research projects that can come from this study. A longitudinal study can be performed to provide:

- An analysis of the effectiveness of the manager's education.

- An analysis of the differences in the type of newsletters.
- An analysis of the type of deviation related to each unit
- An analysis of known CLABSIs having the highest incidences of deviations.
- An evaluation if bathing with CHG decreases CLABSIs and if there a difference between using the liquid CHG and the bath clothes or wipes.
- An evaluation of the impact of flushing central lines with a certain amount of saline at certain times per day on infections rates.
- An evaluation if certain central lines, such as a PICC, port or dialysis catheter, have a higher incidence of infection rates.

There are many studies that could come from this primary and secondary study in an effort to provide safe, effective care for patients who require central lines. Something was as simple as having nurses' review the guidelines of properly managing central lines could save patients' lives.

Impact on Social Change

Social change aligns with the practice of nursing in several ways. The focus is on making things better for someone other than oneself in the hope it will spread to others. One educated in social change notices their viewpoint has changed, and there seems to be a tendency to participate in the change. Scholars who are moral, knowledgeable, and ethical will be role models in encouraging others to advance society to a positive level. The advancement is an intentional process of applying ideas and strategies to promote the dignity and worth of cultures, organizations, communities, or individuals in society that

result in changes that improve social conditions. This study affects positive social change because the research impacts others in a positive manner by potentially giving patients a better quality of life by saving time, money, and their life. The results of this project can be repeated and used worldwide to impact many in a positive way.

Project Strengths and Limitations

Strengths

I am as familiar as possible with the data set and collection process. It is imperative to become familiar with the response categories, as well as the population of the study. The population of the study included all inpatients in this southwestern acute care facility with a deviation found in the management and documentation of their central lines.

Limitations

According to Smith et al. (2011), there are disadvantages to secondary analysis. The population and measures collected in this particular study may not be what I would have chosen to collect. Another important point is someone else may have published a similar study from the same data as I have collected. The manager coached the involved nurse or nurses on the customized CNS developed newsletter to reiterate the purpose and importance of performing this skill correctly. According to Hix, McKeon, and Walters (2009), improvement in quality outcomes can be found in all microsystems. Microsystems which can be used as a base for leaders to improve processes of quality and performances, while acknowledging a connection between the nurses' work environment and their quality of care (White & Dudley-Brown, 2012).

A disadvantage of utilizing secondary data is that it may not answer a researcher's specific research question or contain specific information that the researcher would like to have. Theresa Morrison Ph.D. performed the primary study and did not conduct the initial VAN audits but collected additional variables expanding the data set. Variables can limit the analysis or alter the original questions the researcher sought out to answer. Variables can be defined or categorized differently than the researcher would have chosen.

Recommendations for Remediation of Limitations

The association of the contributing factors may be statistically significant, but not clinically. The original data collected in the primary study was over a 16-week period. A secondary analysis of data used a period of five randomly selected weeks. The latest data collected allowed me to assess whether the reeducation was effective and decreased the number of deficits on the VAN audits. It is important for a researcher to categorize data appropriately.

Self-Analysis

I consider myself a lifetime learner while taking into consideration my personal and professional status. It is imperative to have an understanding of the need for change and collaboration among stakeholders in health care systems to achieve this vision (AACN, 2010). Continued scholarly activities are crucial to satisfying a profession's responsibility to society. Nurses need to collaborate and participate in the progression of the profession through development, evaluation, dissemination, and application of knowledge in nursing practice (ANA, 2010). This concept can be applied to one's

personal development using self-analysis and reflection while identifying strengths and weaknesses to form future goals.

Scholarly Reflection

In the last few semesters, evidence-based guidelines were assessed and compared to this facility's practices on managing central lines. Evidence-based guidelines changes delivered care due to the aim being improved effectiveness of patient-centered care (Blackwell, 2013). This health concern is important to the institution because central line infections can have a very negative outcome for patients physically as well as financially. My participation included leadership and administrative activities and involvement of other research projects this institution was initiating. This participation has enabled me to meet Walden's goal for students to be leaders of positive social change (Walden Doctoral Resources, 2012). Social change, as described by Walden (2012), is a positive process of creating and applying ideas, strategies and actions for the improvement of human and social conditions. Scholarly prepared practitioners become role models to advance the betterment of society.

The School of Nursing's outcomes were met due to the focus of this project. The application of the change theory was applied to a problem in the practice setting which improved population outcomes and translated research findings to practice (Walden University, School of Nursing, 2012). My realization of the political and administrative practices observed throughout my practicum experiences, and the impact on implementation of my project, has given me new knowledge on how staff learns and practices nursing. Each one of Walden's core courses was instrumental in forming the

basis of implementing this project in the practicum environment. However, my hours spent in a clinical setting observing and being a part of multiple research activities learned from theory was the best part of my Doctoral of Nursing Practice (DNP) scholarly education.

Practitioner Self-Analysis

Reflecting on my clinical experiences and relating them to the DNP essentials from the American Association of Colleges of Nursing Essentials for Doctoral Education (2006), I noted that it clearly was a guideline that was followed to ensure an adequate education for the advanced practice of nursing. As an experienced nurse who still works in the ICU and emergency area on a per diem basis, I felt confident after the completion of all clinical hours from this program to apply and obtain a part-time administrative position in a nearby healthcare system. Due to this change in employment, my learning has continued as the realization of an interdisciplinary team approach was shown to be an effective strategy when engaging in change relating to the care of patients (Mitchell et al. 2012). My leadership skills are being cultured and will continue to improve.

Project Developer Self-Analysis

I have integrated many new skills and practices learned from the DNP program. Recognizing health care problems on a small or large scale is one that comes to mind. Not only detecting organizational and system problems in our healthcare environment but having the ability to formulate evidence-based practice resolutions are just some lessons learned from the DNP program. My progress has included the understanding needed to ensure better and safer patient care outcomes, and with my growing leadership skills, I

will impact society in a positive way. My plan is to be a supporter for change derived from evidence-based practices and best practices. My encouragement for higher learning will also serve this facility to develop nurses who will also understand best practice and to be an advocate for EBP to deliver to the patients the best care.

Future Professional Development

My interest at this point is to become involved in health care policy at the legislature level due to my limited experience in this area. The accomplishment utilizing various organizations that I belong to, including the American Nurses Association (ANA), will give me progression in the future in this particular area by having a voice in influencing policy at all levels of government. My plan is to continue reviewing and searching for evidence-based practices and best practices to further the nursing profession for the purpose of providing safe and competent care to patients.

Table 2

List of Units Used in Study From two Southwestern Health Care Facilities in Florida

Facilities
BKDL –Brookdale Rehab Center
NNICU-North Naples ICU
2E-2 East
3W- 3 West
4NN- 4 North Naples
5NN- 5 North Naples
6NN- 6 North Naples
3S - 3 South
4S - 4 South
5S - 5 South
6S - 6 South
3N - 3 North
4N - 4 North
5N - 5 North
GVS - Gulf View Suites
ICU- Intensive Care Unit
CVRU - Cardio-Vascular Recovery Unit
SICU – Surgical Intensive Care Unit

Table 3

Audit Data

	Primary study	Project study
Nursing units audited	18	18
Weeks audited	16	5
Total Number of Lines	627	41
Total number of deviations	621	14
Number of dressing deviations (% of total deviations)	116 (18.6%)	2 (14.2%)
Number of tubing deviations (% of total deviations)	171 (27.5%)	5 (35.7%)
Number of documentation deviations (% of total deviations)	334 (53.7%)	7 (50%)
Total number of lines audited	627	168
Number of lines with one or more deviations (% of total lines)	120 (19.1%)	6 (3.5%)

Table 4

Years of Experience

	Primary study	Project study
Total number of nurses with deviations	495	11
Number with experience less than 2 years (% of total number)	150 (30.3%)	2 (18.1%)
Number with experience 2-5 years (% of total number)	234 (47.2%)	6 (54.5%)
Number with experience greater than 5 years (% of total number)	111 (22.4%)	3 (27.2%)

Conclusion

The learning received from Walden's DNP program has afforded me a new career opportunity and increased my professional growth in the nursing profession. My perspective on change has developed into a positive and necessary force to care

adequately for patients. Although I considered myself having superb critical thinking skills when entering this program, it seems my critical thinking skills have broadened to other areas such as identifying and addressing gaps in the managing central lines by nurses. Becoming a nurse leader and agent for change has been the most rewarding part of this program.

Section 5: Scholarly Product

Manuscript for Publication

Quality of Care Improved through Reeducation on Managing Central Lines

Clinical Research Study

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Abstract

Central line-associated bloodstream infections continue to be the most deadly and costly hospital-associated infections in the United States. The significance of the issue of these infections is the possibility of severe injury or death to the patient. The purpose of this study is to improve the quality of care patients receive in an acute care facility by reducing life-threatening central line infections. This study's research question is: for nurses in an acute care setting, would additional education using Venous Access Nurses' customized newsletters and manager coaching of staff improve the quality of care on patients with central lines? A quantitative, non-experimental' descriptive retrospective study using secondary analysis was used to address this research question. Data for the primary study was collected over a 16-week period, from October 2013 to January 2014. The secondary analysis of five weeks of data was collected into an Excel spreadsheet. In the primary study, and before the staff was reeducated, 19.1% of the lines audited had one or more deviations from the guidelines. After the staff was reeducated and coached by the manager, 3.5 % of lines had a deviation found through the VAN audit. Positive social change implications include knowledge useful for staff nurses, educators and other researchers who are searching for direction in improving health care associated infections (HAIs) rates to provide a better quality of life for patients, decrease cost, increase safety and potentially save a significant number of lives through reeducating staff on managing central lines.

Central line-associated bloodstream infections (CLABSIs) continues to be one of the most deadly and costly hospital-associated infections in the United States. According to the Institute for Healthcare Improvement (IHI; 2013), there have been improvements in the last several decades due to improvements in managing for these types of lines with a 58% decrease of incidences from 2001 to 2009. These infections are still occurring and are being found outside of the critical care areas (IHI, 2013). A CLABSI, as defined by the CDC (2013), is a primary blood stream infection in a patient that has had a central line within a 48-hour period before the development of the blood stream infection. This is considered the eighth most frequent medical error and the second most expensive error, costing thousands of dollars per incident. Sixty-five CLABSIs in the last three years cost a 715-bed southwestern nonprofit healthcare system consisting of two facilities in Florida employing 3,900 people, an estimated $2,275,000 (Naples Community Hospital, 2013). This study was performed in an attempt to decrease central line infections in this system due to a higher than desired amount of central line infections.

Background, Purpose, and Nature of the Project

The purpose of this study is to improve the quality of care patients received in an acute care facility by reducing life-threatening central line infections. There is a need for this study because infection in central lines are an extremely important issue in hospitals today, due to the possibility of bacteria placed directly into the blood stream and causing a life-threatening situation. This study is performed in this facility because there is a higher than desired level of CLABSIs. According to Barnett et al. (2010), CLABSIs are blamed for long lengths of stay in the hospital, high hospital bills, and increased mortality

and morbidity. Those assisting in line placement must follow certain guidelines for insertion and maintenance using sterile technique to insure an infection does not occur. Maintenance of this line includes strict sterile technique during dressing changes.

Research Design, setting, and Data Collection

The setting is a 715-bed southwestern community nonprofit healthcare system consisting of two facilities in Florida, known for their technology use in caring for patients, as well as their cardiac care. Data collection was performed by using the VAN audits over a 16-week period in both facilities.

Health promoting initiatives include compliance or adherence to guidelines for managing central lines and a support system to assist the caregiver (Zaccagnini & White, 2009). The data collected from the primary study contained 15 contributing factors (Table 1) gathered from the VAN audits. The audits were performed once a week by an available VAN nurse on staff every Thursday using a form which is more of a checklist, constructed by the VAN nurse. The VAN audit was used to perform the original study of finding and identify which particular deviation of the guidelines was violated.

This was a quantitative nonexperimental descriptive retrospective study using secondary analysis. Data for the primary study was collected over a 16-week period of 18 units, from October 2013 to January 2014. The secondary analysis of 5 weeks of data was collected into an Excel spreadsheet (Table 2).

The design was a secondary analysis of an ongoing quantitative study in which collected data has been performed by one person or group, but reanalyzed by another person or group to answer a new research question (Polit & Beck, 2004). Variables in the

primary quantitative study, which permitted the researcher to institute correlational and casual relationships between the variables, consist of multiple CLABSI contributing factors (Terry, 2012). Using secondary data analysis saves time, especially in quantitative data, while providing large databases of higher quality could not be collected on one's own. The benefits of using this type of analysis increases time efficiency, decreased effort and increased potential cost savings which must is weighed against limitations of the level of data (Smith et al., 2011). Secondary analysis was utilized in this study, as evidenced by the involvement of collecting and assessing data from a prior collection of data sets. The study was analyzed by frequency and percentages and to note any difference between groups such as years of nurse's tenure.

Presentation of Results

The primary study indicates data were collected over a 16-week period, from October 2013 to January 2014. There were 627 lines audited on 18 nursing units for deviations on managing central lines (Table 2). There were 120 lines with deviations. The 15 contributing factors related to compliance was divided into three types of factors: (a) dressing related, (b) IV tubing administration set related, and (c) documentation related (Table 1). About 19.1% of the lines audited had one or more issues of noncompliance. Documentation related factors presented the most prevalent issue of noncompliance with 53.7% of audited lines having at least one issue in this category. The second most frequent category of problems with compliance was IV tubing administration set related; 27.5% had at least one deficiency in this area. Only 18.6% of the central lines had problems in the dressing related category (Table 3).

The secondary study indicated that reeducating nurses on the guidelines of managing central lines, deviations decreased from 19% to 8.3%. The evaluation was for 5 random weeks after the primary study and was from June to August, 2014. In the 5 random weeks after the reeducation process, there were 14 deviations. This consisted of two dressing, five tubing and seven documentation deviations. Lines audited were 168 on 18 nursing units with nine deviations from the guidelines. In the primary study, 627 lines were audited on 18 nursing units for deviations on managing central lines. The percentage of deviations is 19.1% (Table 4).

There were 495 instances of nurses involved in deviations from the guidelines on managing central lines. Nurses with fewer than 2 years of tenure involved in line deviations is 151 or 30.3%, nurses with 2 to 5 years of tenure is 234 or 47.2%, and nurse with greater than 5 years tenure is 113 or 22.4%. Nurses with 2 to 5 years of tenure at this Southwestern Florida health system have the greatest number of deviations in managing central lines. The tenure of nurses is for this system only, the nurse could have many more years of experience in their profession but for the purpose of this study only the years of tenure in this system is calculated.

- 1= < 2 years
- 2= 2-5 years
- 3= >5years
- Total Number of deviations
- Total Number of nurses involved in the deviation

Primary Study

This primary study focused on CLABSI contributing factors. The VANs performed weekly audits on every patient with a central line in this health care system, which consists of two facilities in Southwest Florida. The results are given to the CNS who prints the EMR containing the documentation in question. The nurse involved in the specific deviation is identified. The CNS selects a premade education newsletter (constructed from the original CBT related to specific deviations). Sent with a form to the manager of the nurse involved in the deviation, it includes the nurse's name deviation and newsletter. The manager receives the premade newsletter, nurse's name, employee number and deviation. The manager reviews this information with the nurse involved and passes on the newsletter. The nurse reads the newsletter and feels she has retained the information and will put the information into practice she then signs the form from the CNS who provided it to the manager. The form is returned to the CNS. All identifying indicators about the nurse is removed and given to the DNP student researcher.

Secondary Study

The secondary study indicated that after reeducating nurses on the guidelines of managing central lines, deviations decreased from 19.1% to 3.5%. The evaluation was for five random weeks after the conclusion of the primary study and was from June to August, 2014. The weeks after the reeducation process, there were 11 deviations noted. Data consisted There were two dressing, five tubing and seven documentation deviations that consisted of 14 total deviations.

Audited lines indicated 168 on 18 nursing units with 14 deviations from the guidelines. In the primary study, 627 lines audited on 18 nursing units for deviations on managing central lines. The secondary study indicates that the reeducation of staff nurses decreased deviations in documenting and managing patient's central lines. The recommendation is to require staff to review the policy and procedures for managing central lines on a yearly basis.

A conference held at Florida Southwestern State College in Fort Myers, Florida on October 16th, 2014 and was called the "Francine Gomberg 7th Nursing research & Evidence-based Practice Conference." The focus this year is "Transforming Nursing Practice at the bedside and Beyond" This primary and secondary study was presented to a large crowd of a multidisciplinary audience by myself. Two of the largest health care systems in the area had presenters discussing their projects. My study will also be available as a manuscript as required by Walden University and available online. A spreadsheet was constructed with numbers indicating the tenure for each employee involved in the deviation such as < 2 years, 2-5 years and > 5 years of tenure.

Implications from this study include stakeholders paying attention to the results of this study. It is a significant issue that nurses deviate from the guidelines procedure on managing lines appropriately per policy of the facility. In this facility, the guidelines found on computer based training may have to occur every year due to the studies finding that reeducating staff has decreased deviations in managing lines. Reeducation will increase the knowledge of nurse's evidence-based practice, while having a positive effect

on the staff and ultimately on the safe care of the population of patients that have central lines inserted.

Positive social change implications include knowledge useful for staff nurse educators and other researchers who are searching for direction in improving health care associated infection (HAIs) rates to provide a better quality of life, decrease costs, increase safety and potentially save a significant number of lives through reeducating staff on managing central lines.

In summary the results of the secondary study found reeducating nurses was effective as noted by a decrease in deviations recorded on the VAN audits and displayed in frequency and percentages. There are other findings derived from the results of the primary study such as the tenure of nurses who have the greatest deviations. In the primary study and before the staff was reeducated, 19.1% of the lines audited had one or more deviations from the guidelines. After the staff was reeducated and coached by the manager, 3.5% of lines had a deviation found through the VAN audit. It would be of value to patients to have the nurses review the guidelines on managing central lines on a regular basis.

Table 1

CLABSI Contributing Factors That the VANs Determine is a Deviation From the Guidelines

Types of Compliance Issues	
Dressing Related:	
	Dressing nonocclusive or bloody
	Dressing Date Missing
	CHG impregnated disk saturated
Tubing related:	
	No alcohol impregnated caps
	Blood in Connector
	Tubing missing or Date Incorrect
	No male and female luer cap
	Tubing Looped
Documentation related:	
	No documentation at all
	Patency issue without resolution
	Incorrect lumen documented
	Incorrect documentation dressing date
	Dressing changed <7 days no reason documented
	Dressing/port needle not changed >7 days
	Connector changed <3 days no reason documented

Table 2

List of Units Used in Study From two Southwestern Health Care Facilities in Florida

Facilities
BKDL –Brookdale Rehab Center
NNICU-North Naples ICU
2E-2 East
3W- 3 West
4NN- 4 North Naples
5NN- 5 North Naples
6NN- 6 North Naples
3S - 3 South
4S - 4 South
5S - 5 South
6S - 6 South
3N - 3 North
4N - 4 North
5N - 5 North
GVS - Gulf View Suites
ICU- Intensive Care Unit
CVRU - Cardio-Vascular Recovery Unit
SICU – Surgical Intensive Care Unit

Table 3

Audit Data

	Primary study	Project study
Nursing units audited	18	18
Weeks audited	16	5
Total Number of Lines	627	41
Total number of deviations	621	14
Number of dressing deviations (% of total deviations)	116 (18.6%)	2 (14.2%)
Number of tubing deviations (% of total deviations)	171 (27.5%)	5 (35.7%)
Number of documentation deviations (% of total deviations)	334 (53.7%)	7 (50%)
Total number of lines audited	627	168
Number of lines with one or more deviations (% of total lines)	120 (19.1%)	6 (3.5%)

Table 4

Years of Experience

	Primary study	Project study
Total number of nurses with deviations	495	11
Number with experience less than 2 years (% of total number)	150 (30.3%)	2 (18.1%)
Number with experience 2-5 years (% of total number)	234 (47.2%)	6 (54.5%)
Number with experience greater than 5 years (% of total number)	111 (22.4%)	3 (27.2%)

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Appendix A: Submission of Checklist

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American Journal of Medicine Manuscript Submission Checklist

Article Type: Clinical Research

Please use this checklist to ensure that your manuscript is complete and in compliance with the AJM Guide for Authors. The online Guide for Authors includes specific details and further explanation for each AJM article type.

	Manuscript File: Required Components and Formatting
	Title page
	Word count
	Structured abstract, unstructured abstract or none
	Running head
	Keywords
	Figure legends
	Title does not exceed 10 words.
	References are superscript in text.
	Text is 12 point, double-spaced.
	Text is in Microsoft Word.
	Acronym use is limited.
	Manuscript has been checked for spelling and grammar.
	Article type is correct.
	Supporting Files (Attached as Separate Documents)
	Cover letter
	Clinical Significance Bullet Points (70 words)

	Written permission for usage of photographs, illustrations, figures, or text from another source.
	Photographs and illustrations are 300 dpi (or greater) tiff files (not Microsoft Word or Power Point).
	Line art figures are Microsoft Word or Power Point.
	Text in figures or graphics is not less than 12 point and not more than 14 point.
	Each table, figure, photograph, or illustration is in separate a file.

Appendix B: Cover Letter

September 15, 2014

Jacqueline L. Raffaele MSN RN CVRN-BC Student
[redacted]

Joseph S. Alpert MD, Editor in Chief
American Journal of Nursing
[redacted]

Dear Dr. Alpert,

As a graduating DNP student at Walden University, my final project is the improvement in the quality of care through the reeducation of nurses on managing central lines.

The attached article describes the process of reeducating nurses who have been found to have deviated from the guidelines established by the facility originating from the Center for Disease Control.

This clinical research article adds to the body of knowledge regarding social change in the field of nursing. This project of reeducating nurses proves to create a positive change in staff nurses managing central lines. A simple cost effective measure potentially save many lives and provide an improved quality of life.

I would be honored to discuss this with you or answer any questions you may have about this project and am offering this for publication in your journal. I am looking forward to hearing whether this article is of interest to the journal of American Nursing.

Sincerely,

Jacqueline L. Raffaele MSN RN CVRN-BC
DNP student Walden University

Appendix C: Clinical Significance

- Central line-associated bloodstream infections (CLABSI) - primary bloodstream infection in a patient with a central line for 48-hour period before developing blood stream infection.

  •CLABSI -most deadly and costly hospital-associated infections in the United States

  •Eighth most frequent medical error and the second most expensive error, costing thousands of dollars per incident.

  •Sixty-five CLABSIs in the last three years cost a 715-bed southwestern nonprofit healthcare system consisting of two facilities in Florida employing 3,900 people, an estimated $2,275,000

  •This study commenced in an attempt to decrease central line infections in this system due to a higher than desired amount of central line infections.

Curriculum Vitae

Jacqueline L. Raffaele R.N. MSN CVRN-BC

Education:

Doctoral of Nursing Practice
Walden University
Minneapolis, Minnesota 2012-present

Family Nurse practitioner program
University of Massachusetts
Boston, Massachusetts 2011-2012

Masters of Science in Nursing
Specializing in Education
Walden University
Minneapolis, Minnesota 2006-2008

Bachelors of Science in Nursing
California University of Pennsylvania
California, Pa 2002-2004

Associate of Science in Nursing
Community College of Allegheny County
West Mifflin, Pa 1988-1991

Professional Experience:

Gulf Coast Medical Center

13681 Doctors Way

Fort Myers, FL

Administrative Supervisor 8/2014- Present

Utica College

Utica, New York

On Line Assistant Professor for Critical Care course 8/2014-Present

Rasmussen College Associate Program

9160 Forum Corporate Pkwy

Suite #100

Fort Myers, Fl 33905 4/2013- 7/2014

Full Time position-Teaching on-line, classroom, lab and clinical.

Nova Southeastern University, Fort Myers, FL Bachelors program

Associate Professor, Teaching Foundations, Adult I,

Adult II, Adult III, OB/Peds, in the clinical setting 4/2011-4/2013

Naples Community Hospital, Naples, Fl

Intensive Care Unit and Emergency Department

Per Diem, Staff Nurse position 11/200-present

Lee Memorial Healthcare System, Fort Myers, Fl

Critical Care areas, Per Diem, Staff Nurse 10/2009-8/2014

UPMC Vital Staffing, Pittsburgh, Pa
Critical Care areas, Full Time, Staff Nurse 5/2009-2/2011

Westmoreland @ Jeannette Hospital of Excela,
Jeannette, Pa Nursing - Full Time Supervisor, 1/09-3//2009

Fastaff Travel agency, Colorado
Full Time Travel Nurse, Critical Care areas 2/2007-11/2009

On Assignment Travel agency, Ohio
Full time Travel Nurse, Critical Care areas 2/2006-11/2009

Western Pennsylvania Hospital, Pittsburgh, Pa
Critical Care areas including the Emergency department,
Mother/Baby, and Med/Surg, Registry department,
Full Time, Staff Nurse 1995-2006

Uniontown Hospital, Uniontown, Pa
Digestive Health center and Emergency department
Full Time, Staff Nurse 1994- 1999

Mckeesport Hospital, Mckeesport, Pa.
Critical Care areas, Med/Surg, and Emergency department
Full Time, Staff Nurse 1993-1994

South Hills Health System, Pleasant Hills, Pa.

Intensive Care unit, Full Time, Staff Nurse 1992-1993

Mon-Valley Hospital, Monongahela, Pa

Coronary Care unit, Full Time, Staff Nurse 1991-1992

Continuing Education:

CVRN-BC, April 2013

Mother-Baby course, October 2000

Critical Care course, June 1991

C.P.R.	American Heart Association	expires 2016
A.C.L.S.	American Heart Association	expires 2016
P.A.L.S.	American Heart Association	expires 2016

RN License:

Florida	# RN 9216680
Pennsylvania	# RN 3175661
Washington	# RN 00167515 (inactive)
Nevada	# RN 53606
California	# RN 690050
Hawaii	# RN 60201 (inactive)
Illinois	# RN 041.362751 (inactive)
New Jersey	# RN 26nr13174900
Maine	# RN R054828 (inactive)

Oklahoma	# RN R00923 (inactive)

Organizations;

American Association of Nurse Practitioners	2011- present
American Nurses Association	2011 –present
American Journal of Nursing	2012 - present
Southern Gulf Coast Nurse Practitioner Council	2012 - present
Nurse Practitioner Council of Collier County	2012 - present

Presentations:

Postpartum assessment	2011, 2012, and 2013
Asthma	2012, 2013
Chest Tubes, Trach Care, and NG insertion	2011, 2012, and 2013

Community:

Chaplin for Fraternal Order of Eagles #4002	2012-2013
Volunteer Wednesdays at Fraternal Order of Eagles, #4002	2012-2013
Volunteer for charity events for Diabetes	2012-2013