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A Urinary Catheter Insertion and Care Program for Reducing Catheter-Related Infections

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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
the review committee have been made.

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Abstract

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MSN, University of South Florida, 2017

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Project Submitted in Partial Fulfillment

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Doctor of Nursing Practice

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Abstract

Many inpatients in U.S. hospitals acquire an hospital-acquired infection (HAI), the majority of which can be attributed to an indwelling urinary catheter. The use of urinary catheters is a common practice within the acute care setting although the placement comes with risk. Improper catheter placement or a lack of care and maintenance can increase patient morbidity and mortality, as well as increase financial strain for the hospital. The purpose of this quality improvement (QI) evaluation was to determine if using a safety checklist and a 2-person urinary indwelling catheter-insertion team would reduce the rate of catheter-associated urinary tract infections (CAUTIs). Kotter's change model informed the project. The evaluation encompassed reviewing the number of CAUTIs in the hospital for the 9-month period starting January 1 and ending October 1, 2018, for pre-QI data ($n = 9$). Following the implementation of the safety checklist, evaluation occurred for the next 9 months, October 1, 2018, through June 30, 2019 ($n = 9$), for post-QI data. At the end of the data collection, analysis of CAUTI rates was conducted using a 2-tail paired t-test to evaluate if there was a statistically significant difference in CAUTI rates. After running the paired t-test, it was determined there was a statistically significant difference in pre versus post-CAUTI rates ($p = 0.0497$). The result of the evaluation demonstrates that through the use of a 2-person safety checklist and leadership support, CAUTIs can significantly decrease in an acute care hospital. This project might support social change by contributing to improved health care outcomes and a reduction in cost of care.

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Dedication

I dedicate this project to my family and all my friends for their support, encouragement, and understanding throughout my journey. If it were not for their support, I would not have been able to achieve my dream of becoming a doctorally educated nurse.

Acknowledgments

I want to thank my committee chair, Dr. Deb Lewis, and my committee members, Dr. Diane Whitehead and Dr. Faisal Abou-Enein, for all their guidance and support during the completion of my doctoral study. I would also like to thank the staff at Walden Univesity for all the support and guidance they provided, from using the online library, navigating online classes, reviewing my DNP project, and overall assisting in completing the DNP program. I would also like to thank my doctoral preceptor for accepting the role, always being there, and keeping me focused on the task. You are amazing and an asset to the organization, demonstrating the personification of amazing leadership. I also want to say thank you to all the team members within the organization who did not hesitate when I had a question or needed help in finding something.

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Section 1: Nature of the Project

Introduction

Patients' lives, and the health of the nation's health care system, are affected every day by health care associated infections (HAIs) through extended hospital stays, morbidity, and death (Hsu, 2014). According to the Centers for Disease Control and Prevention (CDC), on any given day about one out of every 31 inpatients in the United States has at least one HAI (CDC, 2018). Urinary tract infections (UTIs) are one of the most common of the HAIs, with 70% to 80% attributed to the use of an indwelling catheter (The Joint Commission [TJC], 2016). My project was an evaluation of a quality improvement (QI) initiative utilizing a two-nurse catheter insertion system with a safety checklist to reduce catheter-associated urinary tract infections (CAUTIs). A reduction in the number of CAUTIs may result in decreased HAIs, reduced patient morbidity and mortality, and increased patient safety overall; a reduction may also lead to fewer adverse economic effects on society, as well.

Problem Statement

When a urinary catheter is not inserted correctly using an aseptic technique, not cleaned sufficiently, not maintained correctly, or remains in place too long, germs travel either through the catheter (extraluminal) or inside the catheter (intraluminal), thereby infecting the bladder and kidneys creating a CAUTI. CAUTIs are one of the eight preventable conditions that the Centers for Medicare and Medicaid Services (CMS) deemed as "never events" on October 1, 2008, meaning they should have never occurred (Webster, 2017). During the 2 years of 2008 and 2009, a number of initiatives took place

including the CDC publishing guidelines for the prevention of CAUTIs, the Association for Professional in Infection Control and Epidemiology (APIC) publishing the guide to the Eliminations of Catheter-Associated Urinary Tract Infections, and the Society for Healthcare Epidemiology of America (SHEA) publishing new guidelines called Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals (APIC, 2008; Gould et al., 2009; Lo et al., 2008). In addition, the published HAI progress report for the years 2008 to 2014 showed that although other HAIs decreased, no changes occurred in CAUTI rates (CDC, 2016).

I reviewed a QI initiative undertaken by the project organization. The QI initiative involved two nurses in a large Trauma 2 hospital within the organization inserting an indwelling urinary catheter, with one of the nurses utilizing a safety checklist. The use of safety checklists started in aviation when a Model 299, now known as the B-17 flying fortress, crashed on take-off in 1935 during a demonstration flight when a highly qualified pilot with thousands of hours forgot to release a switch that locked the control while on the ground (Gawande, 2010). The ensuing checklist was the inspiration for the well-known World Health Organization (WHO) surgical safety checklist (Webster, 2017). Additionally, inspired by the success of aviation checklists and the WHO surgical safety checklist, John Hopkins Hospital developed a five-item safety checklist for inserting central line catheters reducing central line-associated bloodstream infections (CLABSI) from 11% to 0% (Gawande, 2010). Safety checklist are used in many industries as well as health care to ensure safety or stop omissions of critical steps.

Purpose

The facility implemented the QI project to reduce CAUTI infection, as it had the highest infection rates within the organization, which consists of 14 acute care hospitals in the same geographical area. According to Medicare Hospital Compare, the standardized infection ratio (SIR) at this facility, which compares the actual number of infections at the identified hospital to the predicted number of infections, was 1.25 between the dates of October 1, 2016, and September 30, 2017 (Data.Medicare.gov, 2018). In comparison, the only other trauma center in the same city, which is also similar in size, had a SIR rate of 0.74 during the same period (Data.Medicare.gov, 2018).

Meaningful Gap

According to Berg et al. (2013), an indwelling urinary catheter insertion is a common invasive procedure that health care providers perform knowing that it might cause a UTI as a complication and thus an HAI. Although Berg et al. developed a checklist validation for use during the teaching of inserting indwelling urinary catheters, a gap in the literature exists on use during the insertion in patients. A checklist for urinary catheter insertion similar to the surgical safety checklist developed by the WHO or the CLABSI bundle checklist appears to be lacking, based on my review of the literature.

Practice-Focused Question

Does the use of a safety checklist and a two-person indwelling catheter insertion team reduce the rate of catheter-associated urinary tract infections?

Potential to Address the Literature Gap

The CAUTI problem within the organization may potentially be addressed by having a two-person insertion team use a safety checklist during insertion of an indwelling catheter. A safety checklist is commonly used within highly reliable organizations as a foundation for safety management (Alspach, 2017). Benefits of a safety checklist include standardization, minimization of omissions, identification of sequences to follow, and accountability (Alspach, 2017). Evaluation of this QI project showed that CAUTI rates decreased after the initiation of the checklist. Implementing a new process of using a safety checklist with two nurses may increase safety for patients and address a gap in the practice literature.

Nature of the Doctoral Project

The nature of the doctoral project involved evaluation of a QI program to reduce CAUTIs within a large hospital. The hospital infection control team collected data during the preintervention phase of the project as well as during the postintervention phase as a normal course of day to day operations. During the QI evaluation I statistically analyzed CAUTI data using a paired *t*-test to assess whether there was a statistical significance from preintervention versus postintervention. My approach in gathering the data, after the project had been approved by Walden University's Institutional Review Board (IRB) and the organization's IRB, involved working with the infection control department, education, and the organization's dashboards. The data gathered and compared included the monthly confirmed CAUTIs before the QI implementation and the monthly confirmed CAUTIs after the organization's QI project

go-live date. In addition, data on line days were gathered to assess whether there was a decrease in indwelling catheter usage due to the decrease in starts from the safety checklist.

I searched CINAHL, Embase, Joanna Briggs Institute EBP, MEDLINE, Ovid, ProQuest, and PubMed using the following key words: *bundles*, *catheter-associated tract infections*, *CAUTI*, *checklist*, *Foley*, *associated health care infections*, *HAI*, *two-person*, *urinary catheter insertion*, *urinary tract infection*, and *UTI*. The purpose of the search was to identify any literature published where organizations utilized a checklist for indwelling catheter insertion. During the literature review there was very little documentation on the use of safety checklist during the insertion of indwelling urinary catheters. Based on the literature I reviewed, I anticipated that a two-person team using a safety checklist for insertion of indwelling catheters would result in decreased numbers of CAUTIs. Findings of a significant decrease in CAUTI rates when two registered nurses (RNs) use a safety checklist for indwelling catheter insertion would be a significant finding. Such knowledge would offer another way of reducing CAUTIs similar to the way bundles have reduced the incidences of CLABSI (Gawande, 2010).

Significance

HAIs have continued to be a significant concern for patients' safety with more than 1.7 million HAIs in 2012, including 99,000 HAI-related deaths. UTIs are one of the most common HAIs, and indwelling catheters contribute to 70% to 80% of these conditions (TJC, 2016). With the stakes so high for not only the hospital and the patient, TJC established the prevention of CAUTI as a national patient safety goal (TJC, 2018).

In addition to the effect CAUTI has on the patient and the family, a financial strain is imposed on the health system. According to McAlearney et al. (2017), the current estimates show that CAUTI costs the U.S. health system between $166 million and $345 million each year.

There were multiple stakeholders in this project including patients, family members, staff nurses, management, infection control, and quality control. This project had the support from not only infection control and staff nurses, but also senior management, including the chief nursing officer over the organization's region and the unit managers. CAUTIs are considered never events, have increased mortality for the patients, and increase health care cost for the organizations, giving this QI initiative a high priority.

Summary

The safety checklist has been used for more than 80 years in the aviation industry, not only for the safety of the crew but also the passengers they serve (Gawande, 2010). It would be difficult to find a pilot who would disregard the checklist just for the sake of an on-time takeoff. In large part due to the success of the safety checklist in the aviation industry, the WHO published the surgical safety checklist and implementation manual in 2008 to use during surgery, thereby significantly reducing the number of surgical incidences reducing the overall postoperative complications by 36% in 2009 (Gawande, 2010; Webster, 2017). CLABSI also saw a reduction in infections by using bundles and a safety checklist (Gawande, 2010). In reviewing this literature, I found a checklist similar to the surgical safety checklist developed by the WHO or the CLABSI bundle

checklist to be lacking. My evaluation of the organization's QI initiative therefore established baseline knowledge on using a safety checklist, with two nurses, while inserting indwelling urinary catheters in the reduction of CAUTI.

Section 2: Background and Context

Introduction

Approximately 12.9% of hospital-associated bacteremia comes from a urinary source (Nicolle, 2014). More than 30 million indwelling catheters are inserted in the United States on an annual basis (Carr, Lacambra, Naessens, Monteau, & Park, 2017). UTIs are one of the most common HAIs during hospitalization (TJC, 2016). Patients acquiring a CAUTI have undergone mortality, morbidity, and an increase in the length of stay, as well as an increase in cost to the hospital and health care system (APIC, 2014). The focus of this project was on evaluating a QI initiative to reduce CAUTI using a two-nurse team and a safety checklist.

I begin this section by reviewing the concepts, models, and theories I used. The theory supporting this project was Kotter's change model, which incorporates eight steps for implementing change (Small et al., 2016). I then discuss the project's relevance to nursing practice, in addition to identifying existing literature on the current practices for the reduction of CAUTI as well as the use of a checklist in multiple industries and within health care. A summary of the current problem at the local site, as well as initiatives to reduce the problem, are also discussed. I also review my project role. The section concludes with a summary of key points.

Concepts, Models, and Theories

Although the Kotter's change model is primarily used in business, it also fits the field of nursing and initiatives related to QI because of its adaptability to staff response and the organization as well as its ease of use (Small et al., 2016). Kotter's model

features eight steps for implementing a change (Kotter, 1996; see Table 1). I applied Kotter's model to evaluate the change of utilizing two nurses and the safety checklist.

Table 1

Steps for Evaluating Change Using Kotter's Model

	Kotter's action	Organization's action
Step 1	Sense of urgency	The chief nursing officer (CNO) met with leadership.
Step 2	Form a coalition	The CNO established a group of key individuals, including decision-makers, education, and infection control.
Step 3	Create a vision	The vision was created by the coalition to use a two-nurse insertion safety checklist
Step 4	Communication	All nurses were trained by nurse educators and leaders, as either indwelling catheter champions (inserters), or as observers using the safety checklist. Patient care technicians received re-education by nurse educators on proper care and maintenance.
Step 5	Empowerment	Catheter champions were empowered by leadership to be the experts for the units.
Step 6	Celebrate quick wins	Infection control and unit educators celebrated quick wins for utilization of checklist during insertion during the go-live month.
Step 7	Build on the change	Observation of indwelling catheters in all the units included encouragement for change, identifying strengths, and opportunities.
Step 8	Institutionalizing change	Once the change was established and part of the culture, with identified improvements, the process started to be utilized in other hospitals within the organization.

Note. Eight steps of the Kotter's model for change (Kotter, 1996).

Step 1 of the QI initiative was to create a sense of urgency (Small et al., 2016). The CNO created a sense of urgency for the project by holding a meeting with all

directors, managers, educators, and infection control within the hospital to discuss the increased CAUTI rate. The group was tasked with the challenge to decrease CAUTI within the next few months.

Step 2 was the formation of a guided coalition (Small et al., 2016). The establishment of a coalition included the director of patient services, manager of staff development, manager of infection control, as well as unit educators and infection control nurses. The coalition discussed CAUTI with other hospitals, patient safety networks, and vendors, as well as conducted a literature search. In addition, coalition members reviewed current practices within the hospital.

Step 3 was to create a vision (Small et al., 2016). The vision was created, and decided by the coalition to utilize a two-person team consisting of 2 nurses, and a safety checklist, such as those utilized with the CLABSI reduction QI that occurred at the hospital in previous years. It was assumed that previous CAUTI reduction practices were still in place, although they were discussed during the safety checklist utilization training. These processes already in place included a reduction in breaking the seal after inserting, early urinary indwelling catheter discontinuation, reduction of dependent loops through the utilization of the sheet clip, and urinary catheter care performed during each shift.

Step 4 was communicating the vision (Small et al., 2016). Once the plan for utilizing the checklist was approved and developed, the organization established multiple classes to implement the project. Nurse managers, charge nurses, relief charge nurses, educators, infection control nurses, and other senior specialty nurses in areas such as the emergency department and the surgical department were trained as urinary catheter

champions (inserters). The course for urinary champions included a 1-hour didactic, as well as a 1-hour hands-on utilizing the new checklist in simulated indwelling catheter insertion on manakins by the staff development educators. Staff nurses not trained as urinary catheter champions received training in the role of observers by the assistant nurse managers. The role of a urinary catheter insertion observer involves using the safety checklist and verifying that all steps are followed in a read-do format, as well as the best way to correct the nurse inserting the catheter in front of the patient. There are two styles of checklists; according to Gawande (2010), the first is a read-do in which the observer reads the step, after which the action is taken. The second type is do-confirmed; in this type of checklist, the individual completes the action, then confirmation is made verifying nothing was missed. The reason for the read-do selection is the safety of the patient to reduce the risk of contaminating a sterile field to maintain aseptic technique. In addition, care and maintenance utilizing indwelling catheter wipes were reviewed with the patient care technicians (PCTs) by the unit educators.

Step 5 was empowering others to act on the vision (Small et al., 2016). Once the vision was communicated with the team members, a social change occurred within the units and hospital, resulting in success for the QI intervention. The empowerment of the catheter champions to work with other staff members brought a sense of urgency and accountability in preventing CAUTI, elevating the CAUTI problem to that of preventing CLABSI and ventilator-associated pneumonia (VAP). Also, the catheter insertion observers were now empowered to hold senior nurses trained as inserters accountable in maintaining aseptic technique. Furthermore, both inserters and observers had the

responsibility and empowerment to continue the social climate of change, ensuring other departments such as transporters, rehab, and patient care technicians were maintaining proper urinary catheter positioning and care.

Step 6 was to create quick wins (Small et al., 2016). Once the completion of nurse training occurred, during the first few months after initiation, the unit educators and infection control nurses would walk the units, confirming the utilization of the checklist and the care of the patient. Celebration for the utilization of the safety checklist and quality care and maintenance for indwelling catheters occurred with the individual nurses and PCTs recognizing successful early adoption.

Step 7 was building on the change (Small et al., 2016). For success to be fully recognized, the organization needed to build on the change. At the time of writing, the current change had been in place for 9 months. With the success of the CAUTI reduction within this hospital, the organization began adopting the two-nurse safety checklist in many of its other hospitals.

Step 8 is institutionalizing the change (Small et al., 2016). Institutionalizing the process requires a complete culture change, such as the organization had with a previous CLABSI reduction project. For this project evaluation, I monitored and reported on the cultural change within the original hospital as well as those that are also adopting the two-nurse safety checklist for CAUTI reduction. After reviewing the project, and noting the reduction in CAUTI, senior management realized the benefit and is in discussion to roll out the new procedure to all hospitals within the organization.

Relevance to Nursing Practice

Brief History of the Broader Problem

CAUTI was established as a never event by CMS on October 1, 2008, prompting CMS to publish a guide on preventing CAUTI in 2009 (Gould et al., 2009; Mattie & Webster, 2008). Additionally, APIC and SHEA, the governing bodies for epidemiology and infection control in the United States, both publish guides in 2008 for the elimination of CAUTI (APIC, 2008; Lo et al., 2008). Once the CDC reviewed the progress from the years 2008 to 2014, finding no changes in the reduction of CAUTI and found that in some years, there was an increase (CDC, 2016). No reduction led to APIC, CDC, and SHEA to publish updates to the original 2008 guidelines (APIC, 2014; CDC, 2016; Lo et al., 2014). With no reduction, the American Nurse Association (ANA) also released a new prevention bundle in 2015 (ANA, 2018). With the continued focus on reducing CAUTI, TJC also added CAUTI as part of the national patient safety goals (TJC, 2018).

Existing Scholarly Research

More than 700,000 HAIs occur annually within the United States with 75,000 resulting in death, equating to the seventh leading cause of death (Hsu, 2014). Urinary tract infections are one of the five most common HAIs accounting for greater than 25% of all HAIs totaling 93,330 for the year 2011 in which CAUTI increased the length of stay from 0.5 to 2.4 days, increased mortality, increased hospital cost upwards of $7,000 per occurrence, and caused unnecessary antimicrobial usage (APIC, 2014; Ballard, 2018; Carr et al., 2017; Halm & O'Connor, 2014; Lo et al., 2014; Pashnik, Creta, & Alberti, 2017). CAUTIs are and have been a problem in the United States for many years

resulting in the CDC and national organizations to create strategies and guidelines starting in 2008 (APIC, 2008; Lo et al., 2008). Currently, catheter usage in the United States in hospitals ranges from 16% to 33%, and in the intensive care unit is 67% to 76% (Halm & O'Connor, 2014). Even with multiple guidelines from authors from the CDC, APIC, and SHEA CAUTI continues to be a problem, resulting in APIC and SHEA releasing new updated guidelines in 2014 for the reduction of CAUTI, as well and the American Nurses Association released a CAUTI bundle in 2015 to help aid nurses in the prevention of this preventable HAI (ANA, 2018; APIC, 2014; Lo et al., 2014). All the HAIs including surgical site infections , Methicillin-resistant *Staphylococcus aureus* bacteremia, and *Clostridioides difficile* infections have all decreased, including central line-associated Infections (CLABSI) which has declined by more than 50%, although CAUTI remained the same with no changes to the baseline and even increased some years despite a focus on multiple interventions including early removal (Ballard, 2018; CDC, 2015). In addition, according to Halm and O'Connor (2014) inappropriate catheter usage is still occurring due to a misunderstanding of necessity, lack of physician awareness, and lack of clear orders to have the catheter removed.

Safety checklists have been used for many years and have been adopted by health care to save patients. Over the last 5-years, there has been widespread use of safety checklist in various procedures including creating a significant reduction in surgical morbidity when the teams are engaged, and compliance with the checklist is high (Rakoff et al., 2018; Webster, 2017). Evidence has shown safety checklist are effective in preventing patient harm and helpful in assisting health care providers in mastering

complex procedures (Spruce, 2014). Use of a safety checklist is already in place for many hospitals for central line insertion based on evidence for increased patient safety including John Hopkins hospital where a five-item safety checklist attributed to the reduction CLABSI from 11% to 0% (Gawande, 2010).

Checklists are in use every day without even thinking about the process. When individuals start the day, they create a to-do list, which is a form of a checklist, so significant items are not forgotten thought out the day, such as during grocery shopping people create a shopping list, so nothing is missed to prepare the evening meal. Health care has become so complex and specialized it is hard for providers to remember all the steps for all the procedures which as Gawande (2010) points out there are 50 million surgeries that occur each year, yet 150,000 still result in patient deaths, which many can be prevented through the use of a safety checklist.

Scholarly information regarding the use of a safety checklist is limited. There was only one scholarly article found regarding using a checklist during the actual insertion of an indwelling urinary catheter. Briggs and Ross (2017) described the use of a 24-step checklist in a single intensive care unit with a two-person insertion system, utilizing one individual as an observer and one individual responsible for the insertion of the urinary catheter. Briggs and Ross (2017) explain the use of the two-person system with the 24-step checklist was successful in the reduction of CAUTI within the intensive care unit, resulting in zero CAUTIs over a consecutive 16 month period. An additional article was found in which the author developed a validation checklist to assist in teaching and assessing the urinary catheterization insertion during skills assessment (Berg

et al., 2013). The checklist can be simple or more complex, but all have the benefit of creating reminders, adding clarification, providing consistency, establish an order, producing precision, and allowing for efficiency in a procedure. As Alspach (2017) describes in patient safety and quality care is improved when a checklist is used, based on evidence-based procedures, where the staff is individually and collectively committed to the use of the checklist and patient safety.

Identify Strategies and Current and Previous Standard Practices

Current risk factors include not maintain a closed draining system, not removing the catheter promptly, older age, female, and impaired immunity (Lo et al., 2014). The CDC published strong recommendations (category IB, A strong recommendation supported by low quality evidence) includes; minimizing use, removal as soon as possible, perform hand hygiene both and after insertion or any manipulation, ensure only properly trained persons who know the aseptic catheter insertion have the responsibility, in acute care hospitals insert urinary catheters using aseptic technique and sterile equipment, properly securing the catheter, maintain a closed system, and if breaks in aseptic technique, disconnection or leakage the catheter must be replaced (CDC, 2015). The Joint Commission established prevention of catheter-associated urinary tract infections (CAUTI) as a national patient safety goal and element 07.06.01 in 2018 including; educating staff on the use of indwelling urinary catheters and the prevention of infection, educating patients and families who have an indwelling urinary catheter, developing written criteria based on evidence-based practice (EBP) for placement, following EBP for insertion and maintaining of indwelling catheters, and monitoring for

CAUTI (TJC, 2018). In addition, because of the cost associated with CAUTIs, CMS requires hospital and long-term facilities to report any findings of a CAUTI through the National Health Safety Network (NHSN) to track the HAI and allow hospitals to compare themselves against each other.

Local Background and Context

Beginning in 2015, CMS started a program called the hospital-acquired condition (HAC) reduction program (Rajaram et al., 2015). As Rajaram et al. (2015) discussed, the Affordable Care Act is the federal statute to establish the HAC program to reduce never events during hospital stays in the United States, consisting of the Agency for Healthcare Research and Quality's scores as well as hospital-based HAIs for CLABSI and CAUTI. Additionally, those hospitals in the bottom 25% would have their CMS payments reduced by 1% (Rajaram et al., 2015). According to Koenig et al. (2017), CMS cut payments in 2016 to 758 hospitals by approximately $364 million due to the performance that a hospital had in the key indicators, including CAUTI.

The institution is part of a 14-hospital organization in a large metropolitan area. The hospital undergoing the QI evaluation is a nonprofit hospital with a focus on helping the community. The gap in practice was the continued increase in CAUTI within the hospital, causing the most CAUTIs through the actual number of infections and as a percentage of line-days within the organization. Once reviewed, the organization had twice as many CAUTIs as a percentage identified by the published SIR rate when compared with the other large hospital and the only other trauma center within the city. Training for placement, utilizing the proper catheter to avoid breaking the seal,

identifying proper securement device placement, and indwelling urinary catheter care had all taken part in the past through team member education. Even though retraining took place, the CAUTI rate continued to increase, thus identifying the problem and need for a QI project. CAUTI reduction and control is a priority within not only this hospital but also the entire organization.

Role of the DNP Student

Professional Context

I am a staff nurse with the designation of a clinical nurse expert, equal in the position of a charge nurse. I provide direct patient care and serve as a resource for other nurses. Also, the clinical nurse expert is a primary preceptor for students as well as new graduate nurses. In addition, I hold an MSN with a concentration in nursing education, and during off days, I teach advanced cardiac life support (ACLS), basic life support (BLS), occasionally new graduate skills classes, and the occasional new hire classes for the region. I also serve as chair for the hospital's professional practice council (PPC) and a member of the organization’s EBP council.

Role in the Doctoral Project

I began as an observer in the beginning stages of the organization's efforts to reduce CAUTI. Initially, I was not involved in the coalition reviewing the data, evidence, or the coalition’s literature review. I also was not involved in the decision to utilize two nurses or the creation of the checklist. During the implementation phase as part of practicum experiences, I was asked to teach some of the indwelling catheter champion classes (inserters) as well as review the proper use of the checklist with demonstrating the

proper insertion techniques to some of the observers. I was also involved in talking to each of the units once per week for 4 weeks after the training was concluded and the checklist implementation took place to identify any problems that units were having to bring back to the coalition chair.

The Motivation for Evaluating the Project

The motivation for evaluating this project was a strong sense for patient safety. As Florence Nightingale (1820-1910) stated, one of the requirements that a hospital should uphold to is "do the sick no harm" (Nightingale, 1863, p. preface). Although the thought of do no harm was published in 1863 it was not enough, as shown in the landmark published report by the Institute of Medicine, "To Err is Human: Building a Safer Health System," there were still as many as 1,000,000 people injured and as many as 98,000 deaths annually due to medical errors (Ulrich & Kear, 2014). It is a fact HAIs are the seventh leading cause of death in the United States, and that CAUTIs account for 36% of the HAIs, that caused the motivation for evaluating this quality initiative project (Galiczewski, 2016; Hsu, 2014). If the use of a two-person insertion team and a checklist can reduce the CAUTIs in one hospital, it has the potential to be effective in many others, thus saving patient lives.

In addition to saving lives in the reduction of CAUTI, there is a cost component to the hospital and the health care system. The cost associated with CAUTI according to Hsu (2014) is estimated at $1000 per infection due to *Escherichia coli*, *Pseudomonas aeruginosa*, and *Klebsiella* species. Halm and O'Connor (2014) estimates the cost between $980 to $2900 depending on the type of infection with an annual cost to the US

health system of $424 million to $451 million annually. Using either estimate the cost associated with CAUTIs puts a strain on individual hospitals, as well as the nation's health care system.

Summary

HAIs account for the increased length of stay, increased the cost to the health system, and higher mortality and morbidity with greater than 25% caused by indwelling catheters (APIC, 2014; Ballard, 2018; Carr et al., 2017; Pashnik et al., 2017). With millions of catheters inserted annually in the United States, it is the responsibility of the health care team to find an evidence-based solution to protect the safety of the patients. Utilizing Kotter's change model, the QI project for utilizing a safety checklist during indwelling urinary catheter insertion was evaluated. The safety checklist has been used for many years in the airline industry and recently adopted by the WHO in creating a surgical safety checklist resulting in improved patient safety. Additionally, hospitals have begun utilizing the safety checklist in the insertion of central lines resulting in decreased CLABSI rates. It is through the evaluation of the QI project to demonstrate the use of a similar safety checklist during the insertion of indwelling urinary catheters resulted in similar decreases with CAUTI.

Section 3: Collection and Analysis of Evidence

Introduction

One of the most common adverse effects of using an indwelling urinary catheter is an infection. CAUTI infection rates reported to the NHSN for the year 2011, according to Lo et al. (2014), ranged from 0.2 to 4.8 per 1,000 catheter days. CAUTI is associated with longer hospital stays, increased mortality, and increased cost to hospitals (APIC, 2014; Lo et al., 2014). CAUTIs, as well as other HAIs, were brought to the forefront in 2008 when Medicare officials declared them a never event and announced that the program would no longer be paying for the treatment. Although all the other HAIs were reduced in number during the years 2008 to 2014, CAUTI has remained the same (CDC, 2016). According to Mauger et al. (2014) hospitals across the United States are currently implementing new projects based on evidence to combat the CAUTI increase, including the project facility.

Practice-Focused Question

Even though inserting an indwelling urinary catheter is an invasive procedure, the use of a safety checklist is not a common practice. According to Galiczewski (2016), the common implementation to prevent CAUTI includes education, policies for insertion, daily reviews, and limiting days. This organization implemented the processes discussed by Galiczewski (2016) in the past, although CAUTI has continued to increase. As Gawande (2010) discussed there was a lot of success with the WHO surgical safety checklist and CLABSI bundles with a checklist leading leadership and the coalition to make the decision to institute a two-nurse insertion process utilizing an indwelling

catheter safety checklist. The institution of the new process compelled me to undertake this project evaluation. My practice-focused question was as follows: Does the use of a safety checklist and a two-person indwelling catheter insertion team reduce the rate of catheter-associated urinary tract infections?

Definitions

Catheter-associated urinary tract infection (*CAUTI*): Symptomatic UTI, where an indwelling urinary catheter has been in place for more than 2-days (CDC, 2016).

Central line-associated bloodstream infection (*CLABSI*): A serious infection that occurs when bacteria enters the bloodstream due to a catheter being placed in large veins in the proximity of the heart (Healthypeople.gov, 2019).

Foley: A brand name, although synonymously used to mean indwelling urinary catheter (CDC, 2016).

Hospital-acquired condition (*HAC*) *reduction*: A program established to reduce preventable adverse events by penalizing and reducing payments to hospitals in the United States that are underperforming (Rajaram et al., 2015).

Health care associated infection (*HAI*): Infections that patients acquire during a hospital stay or surgery that they did not have on admission, with many being preventable (Healthypeople.gov, 2019).

Indwelling urinary catheter: A drainage tube inserted through the urethra into the urinary bladder and left in place, connecting to a drainage bag (CDC, 2016).

Never event: One of eight hospital-acquired conditions identified by CMS in 2008 that is generally preventable and no longer reimbursed (Shah et al., 2016).

Urinary tract infection (*UTI*): The presence of clinical symptoms such as frequent urination or lack of urination combined with the presence of bacteria in the bladder (TJC, 2018).

Ventilator-associated pneumonia (*VAP*): A complication that occurs, resulting in pneumonia from microbial infection of the lower respiratory tract while a patient is being treated with mechanical ventilation (Aggarwal, Luhadia, Bhatnagar, & Goyal, 2018).

Sources of Evidence

Protections

The facility signed the site approval documentation for a QI evaluation doctoral project. I submitted the site approval documentation, as well as Walden's Form A, for evaluation to Walden University's IRB. Walden University's IRB approved the doctoral project and is the IRB of record. After receiving Walden University's IRB approval, the facility IRB reviewed the final proposed project and Walden University's IRB paperwork and granted final organizational IRB approval.

Operational Data

According to the manager of staff development at the facility, who also served as chair of the quality control project, the facility had the highest CAUTI rate within the organization, and more than twice the rate as the other trauma center in the city . The published SIR ratings showed the facility was over the acceptable number of CAUTI cases, whereas other hospitals in the area were under the acceptable number. Deidentified data were provided by the manager of infection control with a breakdown of CAUTI rates for January 2018 through September 2018 for the preimplementation data.

The implementation of the QI project took place on October 1, 2018. Data were also provided from the manager of infection control for October 2018 through June 2019 for postimplementation comparison. The information provided allowed for 9 months of preimplementation data and 9 months of postimplementation data.

CAUTIs are a reportable event required by state and national mandates to the CDC and NHSN. Due to the CAUTI rate being a reportable finding to the NHSN, there were no additional data generated that were not generated during the normal day-to-day operations of the facility.

Analysis and Synthesis

The manager of infection control provided me with deidentified data for preimplementation and postimplementation of the improvement initiative. Data were collected in the form of raw numbers of CAUTIs as well as rates per 1,000 days and catheter (line) days. In the CAUTIs that were identified during the postimplementation period, the identification was made by verifying that the checklist was used during the insertion of the indwelling urinary catheter, as well as the first day the patient became symptomatic postinsertion. The organization noted that the only exception for utilizing the checklist was during an emergent situation, such as a trauma.

After identifying the prenumbers and postnumbers, I completed an independent paired *t*-test analysis to determine whether the finding was significant. The groups were two different groups, one being from the time frame of January through September and the other October through June. Because this resulted in an even number of months compared, a paired calculation was used.

Summary

When nurses utilize current EBP in solving current opportunities through assessing, planning, and implementing care, it is the patient who benefits through improved outcomes, improved patient satisfaction scores, and, in the case of CAUTI, prevention that reduces cost (Lovelace et al., 2017). Approximately 12% to 16% of all adult hospitalized patients in the United States will undergo the insertion of an indwelling catheter sometime during their admission resulting in an increased rate of acquiring bacteriuria (Lo et al., 2014). With so many indwelling urinary catheters being placed, the focus needs to be on the patients, particularly keeping them infection-free. CAUTIs are preventable, and it is the nurse who plays a significant role in the prevention of infection.

The evaluation of the CAUTI reduction project utilizing two nurses and a safety checklist supports the evidence established in studies of other medical procedures, with the effects being prevention of infection during the invasive procedure of inserting an indwelling urinary catheterization. Other hospitals that are struggling to control CAUTI may benefit from the findings. Safety checklist utilizing two nurses are beneficial in complex processes, by holding individuals accountable in providing appropriate care, as well as, verifying there are no omission of critical steps.

Section 4: Findings and Recommendations

Introduction

UTIs associated with the insertion and care of urinary catheters have been attributed to HAIs with increased length of stay and an increase in patient morbidity and mortality. Because of the harm to patients and added cost to the health system, CMS stated on October 1, 2008, that CAUTIs are a never event, which means they should never occur (Webster, 2017). The determination by CMS resulted in hospitals no longer being eligible for reimbursement for the treatment (Webster, 2017). The CDC, APIC, and Shea have all published guidelines to address the continued problem of a patient obtaining UTIs from catheter insertion, prolonged usage, and inadequate care (APIC, 2008; Gould et al., 2009; Lo et al., 2008). For the years of 2008 to 2014, CDC published a HAI report showing that CAUTIs had not decreased as other HAIs have; in fact, in some years, there was an increase in the CAUTI rate (CDC, 2018). Due to the stagnant performance, APIC and Shea published new guidelines in 2014, the ANA published a CAUTI prevention tool kit in 2015, and TJC added CAUTIs to the national patient safety goals in 2016 (ANA, 2018; APIC, 2014; Lo et al., 2014; TJC, 2016). With the continued rise in CAUTI and multiple agencies and publications in place, a new way of prevention needs to be devised based on evidence.

The facility where the doctoral project took place also had a rise in CAUTI from 2017 into 2018 and implemented a QI project to reduce this infection. One area for which there is not much literature, and a gap in practice, according to my review, is the utilization of a two-person safety checklist. Inserting a urinary catheter is an invasive

procedure with UTI as one of the common complications, and there is a lack of literature on utilizing a checklist, even with the WHO surgical safety checklist and the success of the safety checklist used for inserting central lines at John Hopkins hospital (Gawande, 2010; Webster, 2017). With this in mind, the organization where the project took place initiated a QI to address the increase in CAUTI through the use of a two-nurse safety checklist for the insertion of all urinary catheters unless inserted in an emergent situation or by a physician. For this QI evaluation, I sought to answer the practice-focused question: Does the use of a safety checklist and a two-person indwelling catheter insertion team reduce the rate of catheter-associated urinary tract infections?

In conducting a scholarly literature review, a better understanding of the nationwide problem of CAUTIs became more evident. In researching the topic, I found that CAUTI incidences are a problem around the globe and are not being resolved in spite of multiple QI projects taking place in many countries (Mauger et al., 2014). I searched CINAHL, Embase, Joanna Briggs Institute EBP, MEDLINE, Ovid, ProQuest, and PubMed. Although there is a great deal of information on CAUTI (ANA, 2018; APIC, 2008; CDC, 2015, Lo et al., 2014; TJC, 2016), there is little information on utilizing a checklist during insertion, although there was one study by Galiczewski and Shurpin (2017) that used direct observation of catheter insertion procedures with success. My finding of a statistical significance when utilizing a safety checklist adds a tool that hospitals and nurses can use to reduce the incidences of CAUTI similar to the way John Hopkins reduced CLABSI and the WHO reduced surgical errors (Gawande, 2010).

The purpose of the doctoral project was to evaluate the QI program initiated in a large metropolitan hospital to reduce the incidence a CAUTI. The hospital infection control department collected data for both preintervention as well as postintervention. Data collection occurred after I obtained approval by the organization's and Walden's IRBs. Data collection was considered part of the normal hospital operations and there for did not have any changes to the day to day operations. The collected data included the number of CAUTIs, the number of days after insertion the CAUTI occurred, the number of line days for each month, and whether the use of the checklist happened during insertion. I compared the number of CAUTIs for the previous 9 months before the QI project to the number of CAUTIs for the 9 months after the start of the QI. The raw number of CAUTIs was statistically analyzed using a paired *t*-test, looking for statistical significance from 9 months preintervention versus 9 months postintervention.

Findings and Implications

The purpose of the DNP project was to evaluate the QI implementation, focusing on utilizing a safety checklist during the insertion of a urinary catheter to reduce the incidences of a CAUTI. The main focus of the QI implementation was on reducing the number of CAUTIs each month. I compared monthly CAUTIs for the 9 months before the QI to those in the 9 months post-QI (see Figure 1).

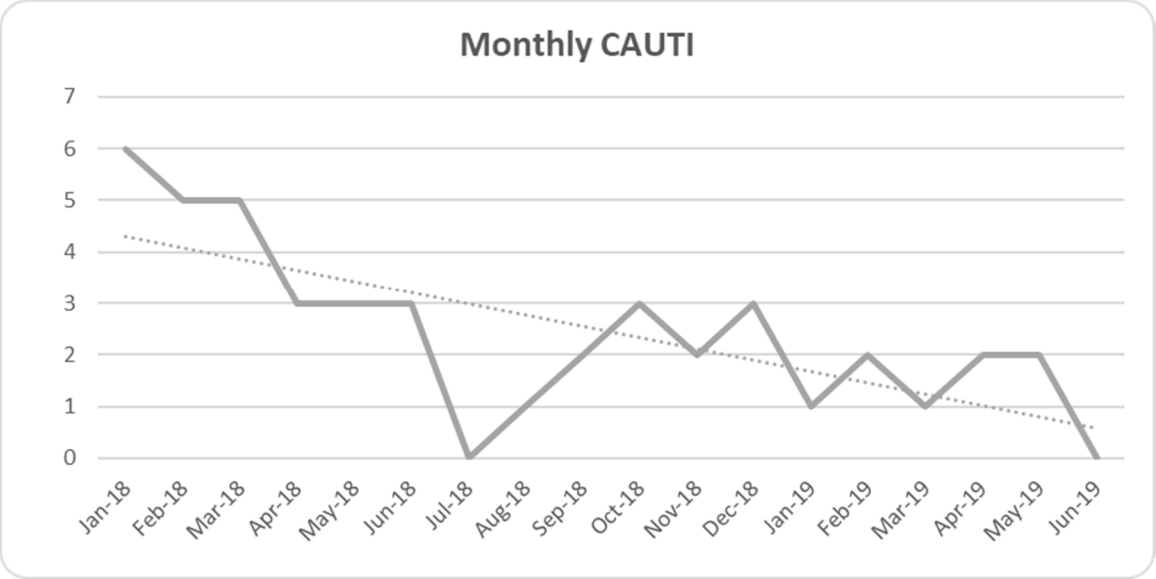

Figure 1. Monthly CAUTI incidences. Pre-QI implementation and post-QI implementation (October 1, 2018).

Using the data provided by the infection control department, I conducted a paired sample t-test to compare the number of CAUTIs within the hospital before and after the implementation of a safety checklist. The reason for the use of the two-tailed paired sample t-test, which is also known as a dependent sample t-test, is because the control group did not change and the evaluation was on the performance utilizing the same group of nurses within the same hospital before and after the QI initiative. The sample size for each group, before and after, was nine. Running the paired t-test with a 95% confidence interval showed an average of 3.11 CAUTIs for the 9 months before implementation and an average of 1.78 CAUTIs postimplementation (see Figure 2). There was a statistically significant difference in the number of CAUTIs for preimplementation ($M = 3.11$, $SD = 1.96$) and postimplementation ($M = 1.78$, $SD = 0.97$) conditions; $t(8) = 2.31$, 2-tailed $p = 0.0497$. The findings are statistically significant as the two-tailed $p \leq 0.05$, which led me

to conclude that the QI project conducted at this hospital did significantly reduce the incidences of CAUTI.

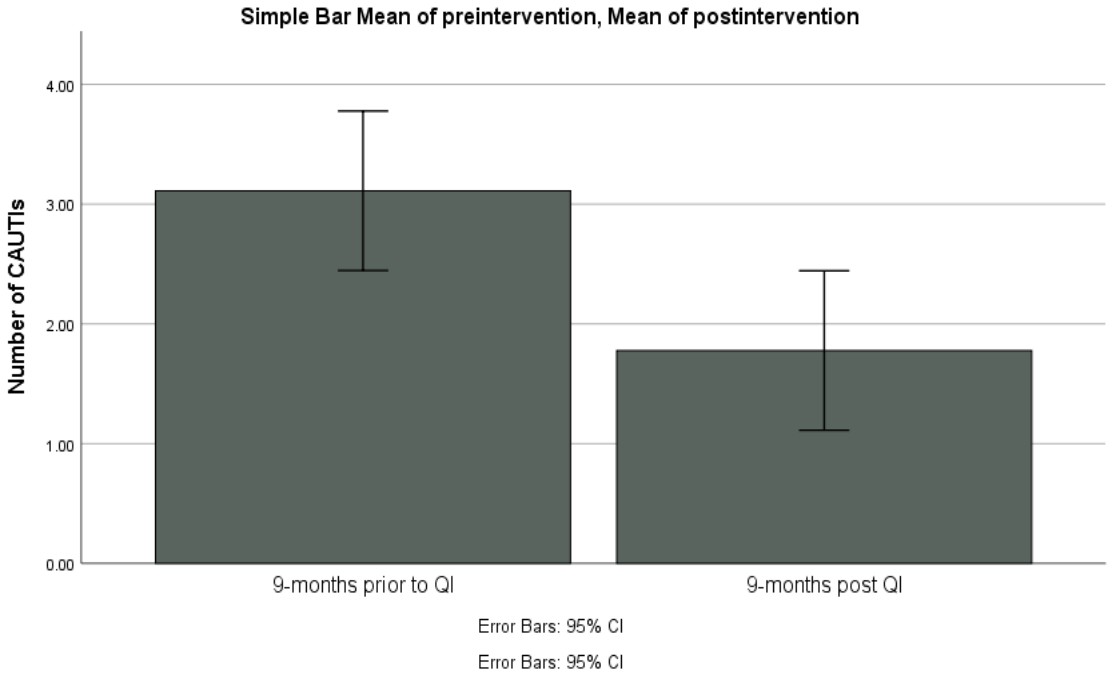

Figure 2. Sample of the mean. Means for the number of CAUTI incidences 9 months before the implementation of the QI project and 9 months after the implantation of the QI project.

In addition to the significant reduction in CAUTI, other areas of positive change took place. On the financial part, there were savings of $18,000 based on an estimated cost of $1,500 per incident utilizing the projected cost identified by Hsu (2014) of $1,000 and Halm and O'Connor (2014) of $980 to $2,900 per CAUTI incident. Additionally, due to the use of the first part of the checklist, which is the indication for appropriate use (see Appendix), the number of catheter days for the hospital decreased (see Figure 3).

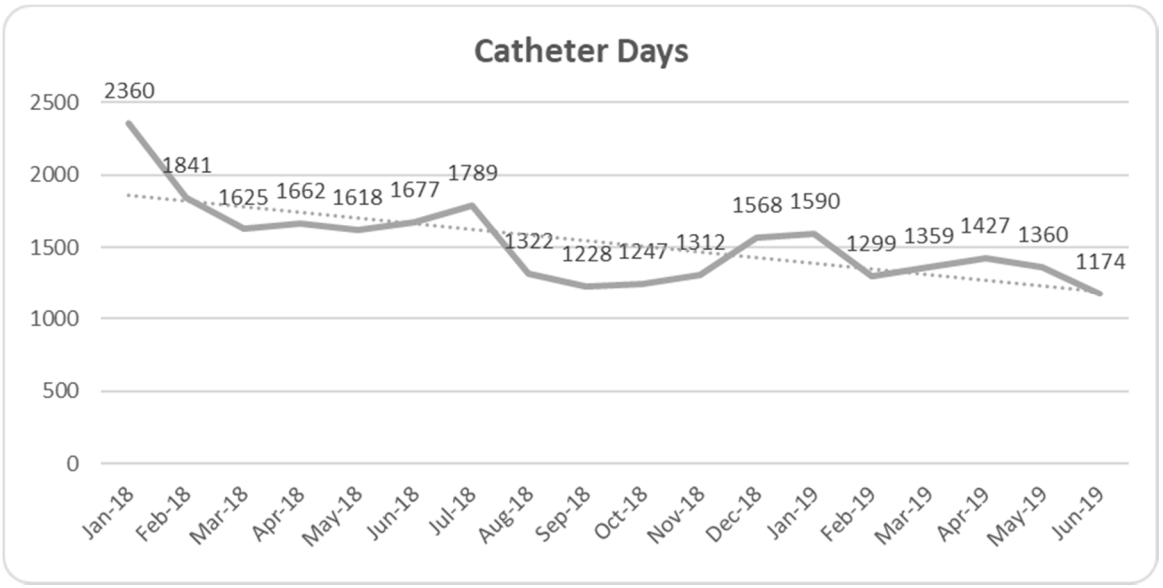

Figure 3. Catheter days. Catheter days for 9 months pre- and post-QI implementation. In addition to the number of days decreasing the CAUTI rate (CAUTIs per 100 catheter days) also decreased after the QI implementation (see Figure 4)

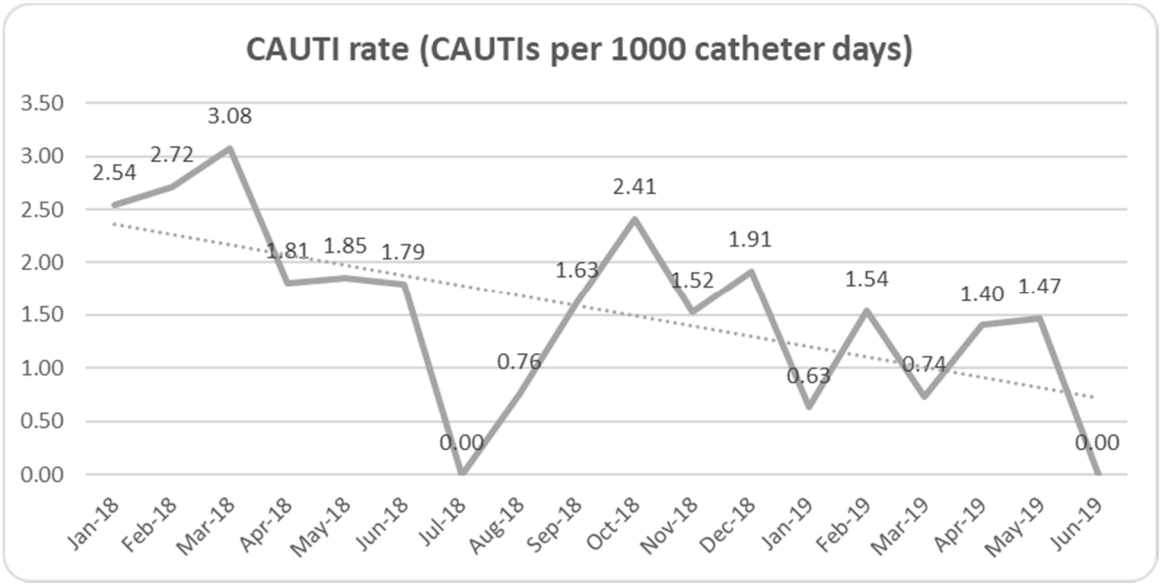

Figure 4. CAUTI rates. CAUTI rates for the hospital as identified by the number of CAUTIs per 1000 urinary catheter line days.

One other finding when evaluating the effectiveness of the project was a surprise in the increased use of female external catheters. For many years there have been

effective devices to utilize for men for external collection of urine. It has not been until recently that there are effective devices for external urine collection on women with immobility. With the use of the safety checklist identifying patients that are not appropriate for urinary catheter insertion, it was noticed by the infection control department that the use of female external catheters increased. The infection control department started tracking the use of the female device in months four through nine after the initiation of the QI project (see Figure 5).

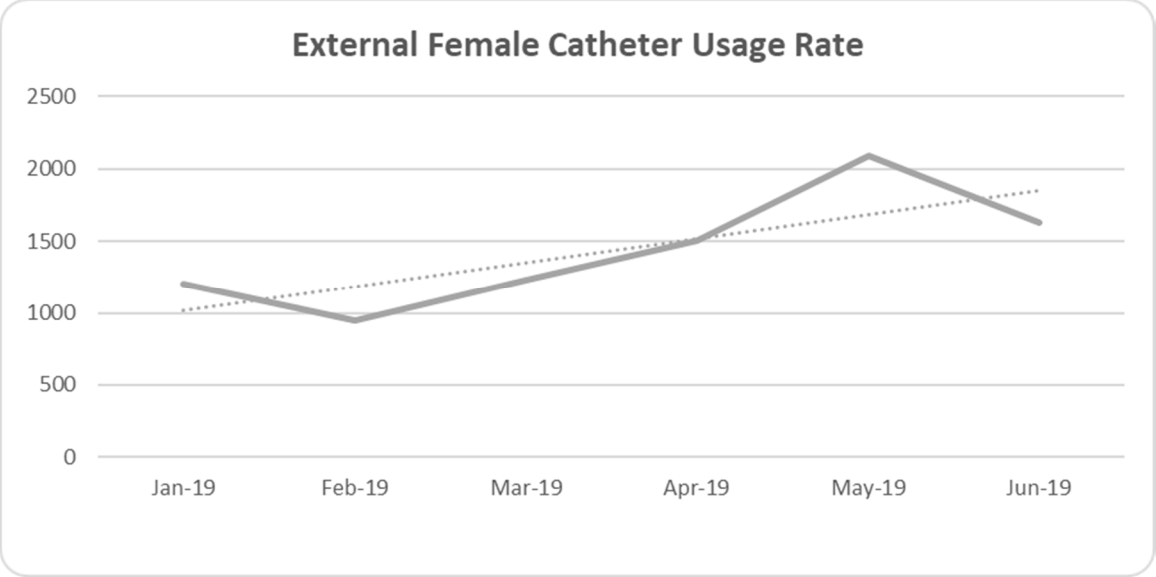

Figure 5. External female catheter usage. External female catheter usages for Months 4 through 9 after the implementation of the QI project.

Unanticipated Limitations

One of the unanticipated limitations was identifying if a CAUTI occurred due to insertion or due to care and maintenance. The initial QI project centered on the reduction of CAUTI in general and was statistically significant as identified with a p=0.0497. The use of the checklist was to reduce the number of CAUTI due to insertion and with this in

mind, the actual day the CAUTI occurred was identified to establish if the UTI resulted from the insertion or a lack of care and maintenance. While reviewing literature, I ascertained that there was no one standard to indicate which day the CAUTI would result from the improper care or the result of improper insertion. Since no one particular day could be found in literature the day the hospital infection control manager utilizes was used to evaluate the CAUTIs, which is day five. If the CAUTI occurred ≤ day four, then it would be considered a result of insertion, if the CAUTI occurred ≥ day five, it is due to care and maintenance. All CAUTIs for the QI project were evaluated for which day the CAUTI occurred for further evaluation of the effectiveness of the safety checklist and future recommendations for CAUTI reduction.

The evaluation of the 9 months before the QI implementation showed 15 CAUTIs occurred ≥ day five, while 13 were ≤ day four (see Figure 6). Compared to the 9 months after the QI initiation, showed 11 CAUTIs occurred ≥ day five, while five were ≤ day four (see Figure 7). The significance in this showed a decrease of eight CAUTIs ruled as caused by insertion, versus only a decrease in four CAUTIs rule as due to care and maintenance. Another significate finding was during the post QI evaluation, of the five CAUTIs ruled as insertion, one insertion by a physician with no checklist, and another insertion by a RN in which a checklist could not be located, resulting in three CAUTIs with the use of a checklist post QI versus 13 CAUTIs ≤ day four prior to the QI initiative. In addition, of the 11 CAUTIs ruled as care and maintenance postimplementation, three were inserted from another hospital without the use of the checklist and transferred to this hospital with the urinary catheter.

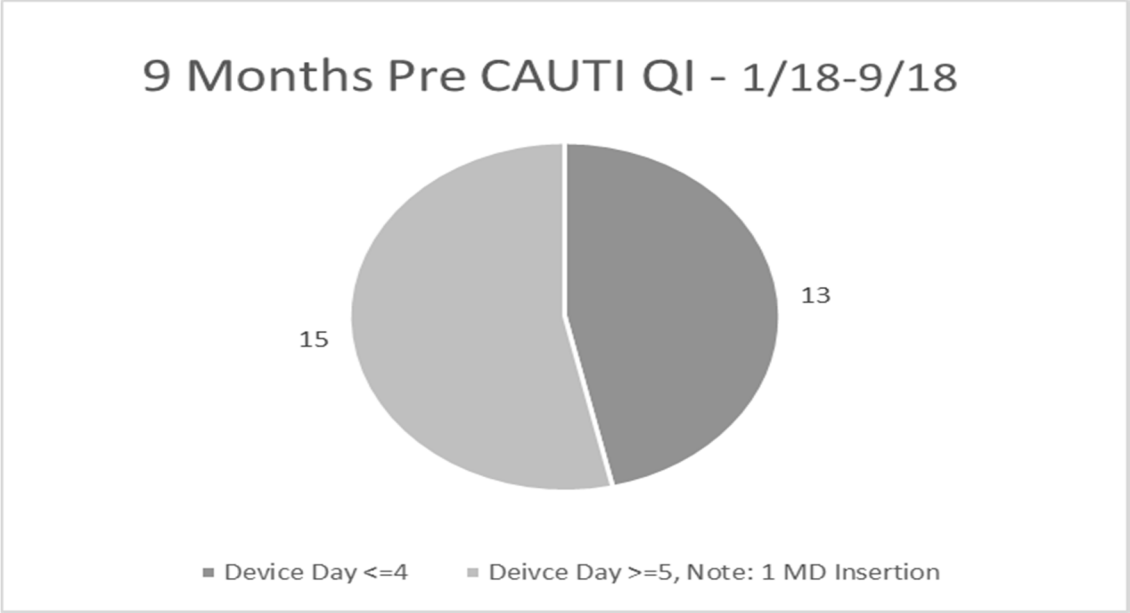

Figure 6. Evaluation of the day the CAUTI occured before the QI start. The graph shows the number of CAUTI with a start day of four or less versus five or greater after the initial insertion day.

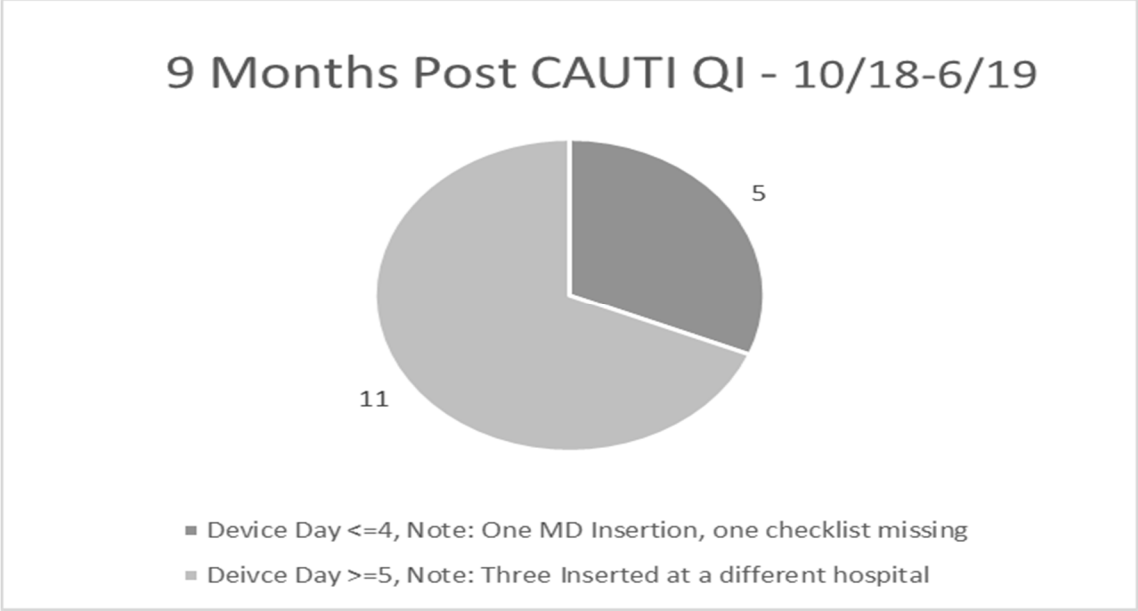

Figure 7. Evaluation of the day the CAUTI occured after the QI start. The graph shows the number of CAUTI with a start day of four or less versus five or greater after the initial insertion day.

As shown in the data, the statistical analysis, and the graphs, the use of a safety checklist is significant in reducing CAUTIs. In cases where the limitation is occurring, the challenge is to identify if a CAUTI is related to insertion or in the care and maintenance.

Potential Implications for Positive Change

With all of the information provided by APIC, CDC, Shea, and the ANA CAUTIs are continuing to rise (ANA, 2018; CDC, 2018). Because of the continued increase in HAIs, CMS decided to no longer pay for infections such as CAUTIs that occur during the hospital stay (Mattie & Webster, 2008). Due to no longer being reimbursed health care organizations now have to absorb the financial burden of the treatment and increased hospital stay. By reducing CAUTIs hospitals will become more financial stable allowing the financial resources to be allocated to more quality patient care.

Today's patients can research everything, including the hospitals within the area through web sites such as cms.gov, hospital compare and leapfroggroup.org showing survey results from patients as well as hospital scores, including the number of HAIs. Individuals no longer have to guess how the local hospital compares to others in the area. Surveys, as well as hospital statistics, are easily found, including not only patients' options but also such facts as the number of CAUTIs a particular hospital has. A positive change is shown on the hospital scorecard, and a reduction in HAIs such as CAUTI will have a positive effect on the hospital's reputation. Patients looking for elective

procedures now can identify the hospital they would like to choose for a procedure similar to identifying a restaurant on Yelp reviews.

Recommendations

It is evident through multiple arenas that safety checklist work. The WHO initiated a surgical checklist to reduce errors, John Hopkins showed that a five-item checklist reduced CLABSI, aviation has used checklist since 1935, and the use of a safety checklist in this QI project showed a statistically significant reeducation in CAUTI (Gawande, 2010; Webster, 2017).

The recommendation of the doctoral project is for further initiation of the safety checklist with evaluation through other hospitals within and out of this hospital's organization. As Alspach (2017) describes the checklist is one of the common items in a highly reliable organization as they standardization processes, minimization of omissions, identify sequences to follow, and hold individuals accountable. The initiation of the safety checklist in other hospitals for urinary catheter insertion requires the buy-in by senior leadership, followed by training on the proper use of the safety checklist and the purpose of the second nurse observer. After training all nurses in one or both roles, leadership needs to evaluate the effectiveness through the infection control department of the hospital.

Recommendations for Future Projects

The recommendation for a future project would be the reduction in CAUTIs within the hospital happening after day five. To a have a reduction in CAUTI after day five would be a joint effort on the not only the nurses but also the PCTs. During the

initial training, all PCTs were trained on the use of urinary catheter wipes and the importance of utilization every shift and every bowel movement, although as evident by the data, this is still an opportunity. A project would include the PCTs and nurses monitoring each urinary catheter on the floors and verify the process is being followed correctly by everyone.

A second project would be a yearly education for nurses as well as PCTs either through in-services or an online PowerPoint. For the nurses, it would be tailored to the use of the safety checklist, the importance of early discontinuation, and proper care and maintenance of the urinary catheter. For the PCTs, the in-service would include the importance of care and maintenance, showing the effect if proper care is not completed consistently or correctly.

Strengths and Limitations of the Project

One of the strengths of the QI project was the finding of statistical significance. This facility will continue to utilize the safety checklist for all non-emergent urinary catheter insertions. A second strength was the overall awareness of the staff regarding the importance of reducing CAUTIs not only for the health of our patients but also for the reputation of the hospital and the financial impact on the health system. Charge nurses are now aware of all catheters on the floor and the significance of care and maintenance as well as the need for appropriate early discontinuation.

One of the limitations of the project was a lack of better identification of the cause of the CAUTI. There was a reduction in early CAUTIs identified by ≤ day four although the project also shows there is not much of a reduction in CAUTIs ≥ day five. With

CAUTIs happen during day five, or later there was a lack of understanding of two important items. The first is the care and maintenance of the urinary catheter, and the second is the early discontinuation of the catheter.

Section 5: Dissemination Plan

Introduction

The purpose of the project was to evaluate the QI project instituted by an acute care hospital. Safety checklists are used in many areas from aviation to health care (Gawande, 2010). Although a checklist in itself will not improve a patient's care, a well-designed checklist with committed providers will prevent complications and save lives (Alspach, 2017). My project finding of statistical significance over 9 months of post-QI data adds to the arsenal nurses have to fight CAUTI infections among their patients.

Ultimately to increase clinical evidence for nurses, all findings should be published or presented in a way to enhance knowledge. One of the expectations for nurses with advanced degrees, such as a Doctor of Nursing Practice, is the ability to apply QI projects and EBP throughout an entire organization or health system to improve patient care (Moran, Burson, & Conrad, 2017). I coordinated dissemination of the finding from the QI project evaluation with the manager of infection control for the hospital. I prepared a PowerPoint presentation, as well a spreadsheet of the data for the 18 months pre- and postimplementation. The PowerPoint presentation on utilizing the two-nurse safety checklist in the other hospitals within the health system was presented to multiple managers and leadership. In addition to dissemination within the organization, the final project will be submitted to ProQuest for publication.

The audience for dissemination should also include nurse leaders, managers of acute care floors, bedside nurses, educators, nurses in the infection control departments, as well as support team members such as PCTs. In my view, anyone who has the

responsibility to insert urinary catheters, or care for patients who have a urinary catheter, should understand the importance and risks associated in developing of a CAUTI. In addition to acute care hospitals, colleges and universities are an appropriate audience to demonstrate the need for utilization of safety checklist in high-risk procedures. Presentation of project findings could show that, when steps are not followed, in what seems like a benign procedure that is completed every day in a hospital setting, there are possible dangerous outcomes.

Analysis of Self

Practitioner

The DNP nurse assists the organization in taking research that has been accomplished or published and placing it into action. The QI evaluation project falls under DNP Essentials II, III, and VI. According to the American Association of Colleges of Nursing (AACN, 2006), Essential II is "Organizational and Systems Leadership for Quality Improvement and Systems Thinking" (p. 10). My evaluation of the hospital's QI project, which encompassed the utilization of a two-nurse safety checklist for patient safety by reducing CAUTI, fell within the scope of Essential II of the DNP Essentials. AACN (2006) stated in Essential II that DNP graduates should develop and evaluate care delivery approaches through effective communication meeting the needs of current and future patients. Additionally, AACN stated in Essential II that DNP graduates are to sustain changes through QI strategies at the organizational level.

According to AACN (2006), Essential III is "Clinical Scholarship and Analytical Methods for Evidence-Based Practice" (p. 11). Completing the collection of data within

the CAUTI reduction QI evaluation and analyzing the results for significance to improve health outcomes supports the scope of Essential III of the DNP Essentials. AACN stated that one area of the Essential III is using analytical methods to determine and implement the best evidence for nursing practice, as well as evaluating QI methods for the promotion of safe efficient and effective care for our patients.

According to AACN (2006), Essential VIII is "Advanced Nursing Practice" (p. 16). Evaluating the use of the two-nurse safety checklist during the insertion of a urinary catheter for its effectiveness falls within the scope of Essential VIII of the DNP Essentials. AACN stated in Essential VIII that the DNP graduate should design, implement, and evaluate interventions based on nursing science as well as other sciences. Additionally, Essential VIII states that the DNP student should develop relationships and partnerships with patients and other professionals to advance clinical judgment while improving patient outcomes through the use of EBP.

As a practitioner, I work at the bedside and precept many nurses, both students as well as new nurses. I have the ability to influence their practice through the use of EBP that has developed over the years while I have earned a DNP. Also, I am on the hospital professional practice committee and have served as chair for the past 2 years; in this role, I also have the ability to influence other nurses and departments with new EBP developments.

Scholar

Nursing practice has changed over time, and started with Florence Nightingale collecting data from different wards and passing the results on to other wards and

hospitals within London (Nightingale, 1863). Nightingale's original writings and actions have developed into what is known today as evidence-based nursing and dissemination of findings through scholarly publications. As a scholar, I evaluated a program to reduce CAUTI rates within a hospital setting and established evidence that a two-nurse safety checklist does significantly decrease the number of patients that develop complications due to the urinary catheter. I disseminated my findings through PowerPoints and spreadsheets working with leadership, department managers, and the professional practice council. The project has developed into standard practice within the hospital and has moved to other hospitals in the organization. This process has allowed me to identify my strengths and opportunities as a scholar and a nurse with an advanced degree.

Project Manager

One of the things I learned from the QI evaluation DNP project is patience. The project took place over many months, and the development of patience took place in waiting for the data to arrive each month from the infection control manager. Also, the line data for the month prior took approximately 2-weeks for tabulation before it was available from infection control. Many of the DNP projects for CAUTI control that are published have a 30- or 90-day collection period for the data. For this project it was determined to utilize a longer collection period to obtain a more established result. To have a good sample size, I decided to collect the data for 9 months after the start of the QI, comparing the results to the 9 months before the implementation date. Utilizing an 18-month time frame allowed for an adequate collection period to evaluate the findings.

Overall reflections on of My Project Journey

The completion of the project has been rewarding, as well as challenging. Throughout the journey, I have worked with many beside nurses and fantastic managers who have helped me to evolve into the nurse I am today who looks at everything with evidence-based nursing as my foundation. This journey has led me not only to ask the question "Why?" but to ask, "Why not?" and "What does the literature or evidence say?" Through my journey within the DNP process and this project, I have developed the foundation to help the new nurses of the future, as well as the insight to initiate change and to provide better care and clinical outcomes for patients.

Summary

CAUTIs are the most common of all the HAIs (Hsu, 2014). These infections cause longer hospital stays for the patient as well as an added financial burden on the health system (Hsu , 2014; Halm & O'Connor (2014) The goal for the QI project was to reduce the number of CAUTIs within an acute care hospital through the use of a nurse-driven, two-nurse checklist utilized during the insertion of all nonemergent urinary catheterization. Every bedside nurse was provided education on the utilization of the checklist (see Appendix) while inserting a urinary catheter. I compared 9 months of preimplementation data, to 9 months of postimplementation data. A two-tail pair t-test revealed a significant difference ($p = 0.0497$) in CAUTI incidences postimplementation of the safety checklist. I presented the findings to the manager of infection control. Currently, all other hospitals with the health care organization are initiating the two-nurse safety checklist. The checklist itself is not the only change need for success, as this

project had the ongoing support from senior leadership from the start through the current day. The evidence provided by the project evaluation addresses a gap in the practice literature on the use of safety checklist to lessen CAUTIs and may contribute to an improvement in patient care and outcomes.

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Appendix: CAUTI Insertion Safety Checklist

Complete on all Indwelling Catheter Insertions and return to CN III

Patient Label

CAUTI Insertion Safety Checklist

Date: _____ Time: ____ Form completed by: _____Unit: _____

Nurse inserting catheter: _____

Select One	Appropriate Indication
	Critically ill requiring accurate measurement of urinary output
	Acute urinary retention or bladder outlet obstruction
	Incontinent patient with an open sacral or perineal wound
	End of life care
	Perioperative use in selected surgeries; GU related
	Required immobilization (trauma or surgery)
	Neurogenic bladder
	Other:
Check if done	**Technique for Insertion**
☐	Performs hand hygiene
☐	Dons clean gloves
☐	Aseptically opens Peri-Care Kit
☐	Completes peri-care using provided castile soap wipes
☐	Removes soiled gloves
☐	Performs hand hygiene with alcohol hand sanitizer provided
☐	Using aseptic technique, opens CSR wrap
☐	Dons sterile gloves
☐	Places underpad beneath patient, "shiny"/plastic side down
☐	Positions fenestrated drape while maintaining aseptic technique
☐	Saturates 3 foam swab sticks in Povidine Iodine
☐	Attaches the water filled syringe to the inflation port (NOT pre-testing the balloon)
☐	Removes catheter from wrap and lubricates catheter
☐	Prepares patient with 3 foam swab sticks saturated in Povidine Iodine using the nondominant hand for the genitalia and dominant hand for the swabs.
☐	Inserts catheter aseptically
☐	Inflates catheter balloon with the entire amount of sterile water as indicated by catheter
☐	Places securement device
☐	Positions hanger on bed rail as foot of bed, uses green sheeting clip to secure the drainage tube, indicates date and time of insertion on orange label and secures to drainage bag.