

2020

## Prevention of Care of Catheter-Associated Infections in Long term Care

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Walden University

College of Health Sciences

This is to certify that the doctoral study by

Maureen Edozie

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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Walden University

2020

Abstract

Prevention of Care of Catheter-Associated Infections in Long term Care

by

Maureen Edozie

MSN, Walden University, 2017

BSN, Kaplan University, 2015

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

August 2020

## Abstract

The incidence of catheter-associated urinary tract infections (CAUTI) in long-term care settings ranges from 1.5 to 3.3 per 1,000 catheter days for adult. Over 380,000 nursing home residents are hospitalized due to infections each year. Staff education using Agency for Healthcare Research and Quality (AHRQ) practice guidelines showed knowledge gained. The use of an evidence-based practice guideline developed AHRQ has been shown to significantly reduce the rate of CAUTI in the long-term care residents. The clinical practice problem was a CAUTI rate higher than the national average in the long-term care facility of interest due, in part to inconsistent nursing practice. The practice focused question addressed whether an educational program regarding evidence-based clinical practice guidelines for CAUTI would improve the knowledge of the nursing staff. The educational program on catheter insertion, maintenance, and removal was provided to 48 staff nurses by nurse educator. The validated AHRQ knowledge scale results were analyzed using paired sample *t-test* showing a statistically significant increase in knowledge from pretest ( $M=73.15$ ,  $SD$  11.65) to post-test ( $M=90.41$ ,  $SD$  = 5.35),  $t(8) = -2.345$ ,  $P=0.006$ . The expected positive social change is that increased knowledge on the use of AHRQ best clinical practice guidelines for preventing catheter-associated urinary tract infection will result in reduced rate of infection among residents, better health outcomes, and improved quality of life. Other long-term care facilities can replicate this project, enhancing transferability of this education to improve the quality of geriatric nursing care practices.

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## Dedication

I dedicate this Doctoral Project to my wonderful mother, Fannie Arinze in remembrance of her death and my great father, Joseph Arinze who is the architecture to my success in life. I also dedicate it to my amazing and wonderful husband, Victor, my children; Tiffany, Napoleon, Sylvia, Victoria and Anaya for all your immense contributions.

## Acknowledgments

I would like to thank my family, especially my husband and children, friends and colleague for their individual contribution in ensuring that I attain the highest level in nursing profession. My special thanks go to Dr. Garner, our DNP project instructor for her amazing support and endless patience. I also, will use this opportunity to appreciate my preceptor, Dr. Chinwe Okudo for her mentorship and encouragements throughout my project and terms.

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## **Section 1: Nature of the Project**

### **Introduction**

There were approximately 1.4 million residents in nursing homes in the United States in 2014 (Centers for Disease Control and Prevention, 2017). Researchers have shown that urinary tract infections (UTIs) remain the most common hospital acquired associated infection, affecting between 5-10% of residents with dwelling urinary catheters (CDC, 2015). The incidence of catheter -associated urinary tract infection (CAUTI) in long-term care settings such as inpatient rehabilitation facilities and chronic care units ranged from 1.5 to 3.3 per 1,000 catheter days for adult (Hollenbeak & Schilling, 2018). Over 380,000 nursing home residents are hospitalized annually for the treatment of CAUTI (CDC, 2015). Each CAUTI is associated with the medical cost of \$758. Over \$340 million spent in health care is attributable to the incidence of CAUTI in the United States. each year (Scalise, 2018).

The use of evidence-based practice guideline developed by the Agency for Healthcare Research and Quality has been shown to significantly reduce the rate of CAUTI in the long-term care resident (AHRQ, 2017). Researchers have shown that catheter-associated urinary tract infection was reduced by 54% in about 404 nursing homes among 38 states who participated in a national patient safety effort (Krein, Mody & Saint, 2017).

### **Problem Statement**

Urinary tract infections remain the most common health associated infection, affecting between 5-10% of residents with dwelling urinary catheters (CDC, 2015).

Nursing home/skilled nursing facilities' resident infection rates range from 1.6 to 5.2 million infections per 1,000 resident care (CDC, 2015). Over 380,000 nursing home residents are hospitalized to death due to infections each year (CDC, 2015). UTIs account for up to 31% of sepsis diagnoses, which is the leading cause of death for noncardiac intensive care patients (Dreger et al, 2015).

The clinical practice problem was that this subacute and long-term facility rate of catheter-associated urinary tract infections was 3.01, which is higher than the national average of 0.7339 (CDC, 2017). Clinical observation and case reviews by medical directors revealed a gap in nursing practice, as the nursing staff was not consistently following recommended clinical practice guidelines contributing to the high rate of CAUTI at the facility. Inconsistent health care delivery in nursing home facilities has prompted the government agencies such as Centers for Medicare and Medicaid Services and the CDC to published guidelines in preventing CAUTI (Mody, et al., 2015). Researchers have shown that common prevention practices for catheter-associated UTIs include wearing gloves, handwashing, sterile barrier maintenance, no touch insertion technique, and the use of silver coated catheters (Fink, et al, 2012). Education of the nursing staff on best practice can promote resident health and lead to prevention of CAUTI (CDC, 2019).

### **Purpose of Study**

A gap in nursing existed with the nursing staff not consistently following recommended clinical practice guidelines resulting in the high rate of CAUTI at the facility. The purpose of this education program was to increase the knowledge of the

nursing staff on best clinical practice using AHRQ guidelines. This education program has the potential to improve the knowledge among nursing staff and increase the quality of health outcome. The practice-focused question was: “Will an educational program on evidence-based clinical practice guidelines for the prevention of catheter-associated urinary tract infections improve the knowledge of the nursing staff in this facility”?

### **Nature of Doctoral Project**

Sources of evidence regarding successful CAUTI programs are found through a literature search of CINAHL, Academic Premier, and PubMed databases, Control Prevention (CDC) and the Institute for Healthcare Improvement (IHI) CAUTI bundle and CAUTI algorithm. The Agency for Healthcare Research and Quality (AHRQ, 2019) has released a new evidence-based toolkit that will help in reducing catheter-associated UTIs in the long-term care facilities. The checklist tools cover implementation, sustainability, and resources.

The guidelines address strategies to improve nursing practices, increase compliance rate, and lead to improved quality of health outcomes. Utilizing this approach will further close the gap in practice for nurses and providing comprehensive care to the long-term nursing staff. The approach followed Walden DNP manual for staff education in planning, implementing, and evaluating the program. The education program included an oral presentation, handouts, and practice on proper Foley catheter insertion, maintenance, and removal. Careful handling of urinary catheters is considered as one of the main responsibilities nursing staff has in caring for patients with urological disorders (Collins, 2013). Education material has been developed and validated by the Agency for

Healthcare Research and Quality (AHRQ, 2019), which includes pre and post knowledge questionnaires. Education will be offered at differing times to meet the needs of the staff (Gould, 2015). The purpose of this study was to close the gap of the current practice among staff by establishing and adhering to the clinical practice guideline in ensuring CAUTI prevention and CAUTI rate improvement

### **Significance**

Creating and implementing a comprehensive staff education on CAUTI prevention will be beneficial to the patients, nurses, nurse practitioners, doctors and family members as well as other interdisciplinary members. Improving patient's care with clinical practice guidelines may result in protocols adherence, improved compliance and disease prevention by staff leading to a decrease in mortality and morbidity rate. The impacts of nursing education on the use of guidelines in ensuring CAUTI prevention will demonstrate the need for the providers to communicate and collaborate care with the nursing staff caring for patients with a Foley catheterization.

Reinforcing and implementing the latest AHRQ guideline will help the nurses to inculcate best practice into their clinical practice which will help reduce the rate of CAUTI and unnecessary use of antibiotics. The ultimate purpose of this project is to help improve patients' quality of care and outcomes which will be measured by CAUTI rate reduction, making this project transferable to other facilities for adoption and utilization for the clinical improvement outcome.

**Social Change**

The mission of Walden University is to promote and facilitate partnerships, research, and projects that promote positive social change. Walden provides student with the means and resources to advance their scholarly ideas into strategic actions to better individuals groups and societies (Walden University, 2018). This education program was intended to improve awareness of the importance of using clinical practice guidelines in nursing practice and result in a change in practice behavior. Education and the use of best clinical practice guidelines for preventing urinary tract infection will result in reduced rates of infection among residents, better health outcomes, and improved quality of life.

**Summary**

Approximately 1.4 million residents in nursing homes in the United States experience catheter-associated UTI (CDC, 2017). There is a need for adherence to the updated AHRQ guideline on care of patients with an indwelling catheter. Nursing staff taking care of these patient with urinary catheter has a major responsibility in ensuring that catheter use is indicated, proper technique is used during insertion, maintenance and removal. This can be achieved through staff education, follow up mentoring, and enforcement of adherence with protocols. Section 2 will provide additional information on the background and context of the study.

## **Section 2: Background of Study and Context**

### **Introduction**

Catheter-associated UTI is particularly important health issue in US long term care facilities. The clinical practice problem was that this subacute and long-term care facility's rate of catheter-associated UTIs is 3.01 of residents, which is higher than the national average of 0.7339 (CDC, 2017). The clinical observation and case reviews by medical directors revealed that a gap in nursing exists, as the nursing staff is not consistently following recommended clinical practice guidelines resulting in the high rate of CAUTI at the facility. The purpose of this staff education project was to improve staff knowledge. Improved practice can reduce the number of CAUTIs among this population, thus improving their quality of life and preventing the development of sepsis and hospital admissions. The practice-focused question was "Will an educational program on evidence-based clinical practice guidelines for the prevention of catheter-associated urinary tract infections improve a knowledge and self-efficacy of nursing staff in the facility"? This section discussed the concept, models, theories that are relevant to nursing practice.



## **Concepts, Models, and Theories**

The theoretical model for the CAUTI education program was the use of Malcom Knowles theory of adult education. Knowles used five assumptions to improve learning; self-concept, adult learner experience, readiness to learn, orientation to learning and motivation to learn. This theory is specifically developed for adult learning, it emphasizes that adults are self-directed and as such can take responsibility for their decision (Misch, 2002). This theory learning entails the fundamental adult learning program that include; what adults need to know, learner self-concept, role of learner experience, readiness to learn, orientation of learning and motivation (Misch, 2002).

The conceptual model has a relationship between education and staff compliance, which can lead to improvement in practice settings. The model for improvement involves the use of plan-do, study-act (PDSA) cycle in finding out what this project is trying to accomplish, the impact of change-whether it resulted to any improvement or not (Institute of Healthcare Improvement, 2020).

The evaluation model was Kirkpatrick's model for evaluation of continuing education. A team of four reviewed the material and planed the presentation. The experienced nurses assisted with hands-on stimulation training. The education program takes 3-4 hours for the presentation, simulation, and pre/post testing. Per the Kirkpatrick Model (2018) for evaluation of continuing education, the participants will be asked to complete a-pre to assess level of knowledge and posttest for knowledge gain. Nursing as a profession has the responsibility to contribute to the good of society through knowledge-based practice. Knowledge is built upon theories, and theories, together with

their philosophical bases and disciplinary goals, are the guiding frameworks for practice (McCurry, Revell, & Roy, 2010).

### **Relevance of Nursing Practice**

Nurses are at the frontline in preventing catheter-associated UTI is considered the most common type of health care-associated infection as reported by National Health Safety Network (Health Research and Education Trust, 2017). Patients with an indwelling urinary catheter are at greater risk for infection. According to CDC, among hospitalized patients, 15- 25% receives catheterization (Health Research and Education Trust, 2017). Catheter-associated UTI has been associated with increased length of hospitalization, costs, mortality and morbidity rate (Health Research and Education Trust, 2017). Involving interprofessional teams of those who place and maintain indwelling catheters in education is important in ensuring infection prevention. A vast majority of the hospitals (92%) and nursing homes (91%) consider Centers for Medicare/Medicaid Services (CMS) measures clinically important, and 90% of the hospitals and 83% of the nursing homes reported that performance on CMS quality measures reflects improvements in care (CMS, 2018).

There is a need for nursing intervention in reducing catheter-associated urinary tract infection. The use of sterile technique during catheter insertion, removal and maintenance, use of antiseptic solution in cleaning meatus before foley insertion, change of urinary catheter bag, adequate placement of the urinary catheter bag, use of leg wraps and placement of antiseptic solution in urinary bag (Willson, et al., 2009).

Nursing staff have a several roles to play in ensuring that there is a reduction in mortality, morbidity rate and cost associated with CAUTI prevention. This role includes early identification of patient who do not need the Foley and then request for its removal, ensuring that guideline stipulated by CDC are used at all times when caring for patient on Foley catheter.

Incorporating best practice evidence into the education program with the support of stakeholders, providers, nursing staffs will ensure better health outcome. This will assist in closing the gap in the practice for nursing practices and preventing catheter associated urinary tract infection among the patient living in the nursing home.

The theoretical framework for infection prevention and control outlines the epidemiologic concepts of host which is the resident and staff in long-term care settings, agent-pathogen and environment and their relationships to each other in infectious disease transmission (Cohen, Choi, & Stone, 2016). Activities intended to reduce host susceptibility, agent presence or environmental causes are infection prevention practice protocols (Cohen, et al., 2016). Recognizing the need for safe practices through reduction in CAUTIs, the Agency for Healthcare Research and Quality established a toolkits and implementation guide for healthcare facilities such as nursing homes to adopt for better practices (Hung, 2017). The goal of the intervention will be to modify practices in the nursing homes using the AHRQ technical bundle, regular assessments, training for catheter care, care planning for incontinence patients to empower teams, offering solutions with the main idea of ensuring patient's safety in the clinical practice (Hung, 2017).

## **Local Background**

The setting for this study is a subacute and long-term care facility located in an urban area of the United State. There are 250 residents with an age range of 40-102 years. Subacute residents stay up to 100 days, while long term residents live there as their primary residence with an average stay of 20-22 years. The most common diagnoses of this population include benign prostate hypertrophy, spinal injuries, dementia, stroke, Parkinson's disease, and acute kidney infections. All these conditions have a higher rate of incontinence and the chance of needing catheterization during their stay. Management has agreed to support this education project and considers this part of their quality improvement plan. The target audience for this study is 28 nurses and 20 nursing assistants.

Lengthy in dwelling catheterization during facility stay, use of non-aseptic technique during insertion, maintenance and removal of urinary catheterization has been a major issue among nursing home residents. Effective education is needed to ensure that nurses possess the skills and knowledge needed in caring for patient with Foley catheterization. Creating a CAUTI bundle in nursing home and adhering to the protocols will help in infection reduction. Research has shown that New Jersey used AHRQ's toolkit to enhance staff knowledge about catheter-associated urinary tract infections by 20% with 264% improvement in an indwelling catheterization free day between 2015 and 2016 (AHRQ, 2017). The model of use of AHRQ toolkits enhances nursing home resident safety by fast tracking and increasing the implementation of intervention with self-efficacy while engaging providers and staff a variety level of CAUTI prevention

(Mody, et al., 2015). A cohort study conducted between March 2014 and August 2016 involving 568 nursing homes across 48 states showed that the implementation of AHRQ showed a significant reduction in CAUTIs (Hung, 2017). There was a 75% reduction in CAUTI rate following intervention with the implementation of AHRQ, and the decrease was sustained for one year (Rhone, et al., 2017). A 4 cohort study by Mody et al. (2017), involving 568 community nursing homes with 404 that met the criteria for inclusion showed a reduction of CAUTI from 6.78 to 2.65 infections per 1000 catheter-days with the use of AHRQ toolkits. The purpose of the regression model and adjustment showed a rate reduction from 6.42 to 3.33.

### **Role of the DNP Student**

As a doctoral nursing program student practicing as a nurse practitioner in a long-term care setting, I saw a need for staff to understand CAUTI prevention through the adherence to the protocols and how it can create improved health outcomes. Many staff stated that they use shortcuts during urinary catheter placement, maintenance and removal. They also verbalized that they are not aware of the AHRQ guidelines in CAUTI prevention. Some staff were surprised to learn that most patients might not need a Foley for a long period of time. They did not understand what a voiding trial is all about in regard to CAUTI prevention.

I have witnessed many staff failing to use aseptic technique when caring for a patient with indwelling catheterization; not using catheter kit tools, gloves, catheter hanging beside the bed instead of below the bladder, recurrent treatment of UTIs, unnecessary use of antibiotics and resulting resistance. I have been in this field for over a

year and have seen many things done in a manner that is contrary to national guideline, and I know that there can be better outcomes if managed effectively. I have no personal bias in this project.

My role in this doctoral project is to develop and deliver education among nursing staff in long term care facility on how to use aseptic technique during Foley catheterization, its maintenance and removal. A pre-test and post-test will be used to assess knowledge gain on the use of and adherence to protocols in CAUTI prevention.

### **Summary**

The observation and case reviews by medical directors revealed that a gap in nursing practice exists as the nursing staff is not consistently following recommended clinical practice guidelines contributing to a high rate of CAUTI at the facility. The practice focused question is: Will educational program on evidence -based clinical practice guidelines for the prevention of catheter-associated urinary tract infections improve the knowledge and self- efficacy of the nursing staff in this facility? Education and provision of tools such as checklists for the nurses should improve care by causing a reduction in the infection risk and improve the management of the patient with urinary catheters. The education of nursing staff on best clinical practice using both didactic and simulation activity has the potential to improve the knowledge and support improved self-efficacy of nurses and address this gap in practice. This should result in lower infection rates and improved quality of health outcomes for residents. The wide-ranging clinical practice CDC guideline for providers and nurses will help decrease the mortality

and morbidity. The next section will provide more on the collection and analysis of evidence.

### **Section 3: Collection and Analysis of Evidence**

#### **Introduction**

The observation and case reviews by medical directors revealed that a gap in nursing practice existed with the nursing staff not consistently following recommended clinical practice guidelines contributing to a high rate of CAUTI at the facility. The practice focused question is: Will an educational program on evidence-based clinical practice guidelines for the prevention of catheter-associated urinary tract infections improve the knowledge of the nursing staff in this facility? Education and provision of tools such as checklists for the nurses should improve care by causing a reduction in the infection risk and improve the management of the patient with urinary catheters. The education of nursing staff on best clinical practice using AHRQ practice guideline has the potential to improve the knowledge and address this gap in practice. This should result in lower infection rates and improved quality of health outcomes for residents. The purpose of this DNP project was to provide educational program to increase knowledge of the nursing staff on best clinical practice using both didactic and simulation activity. Section three will discuss the collection and analysis of evidence.

#### **Practice Focused Question**

The education of nursing staff on best clinical practice using both didactic and simulation activity has the potential to improve the knowledge and support improved

self-efficacy of nurses. An improvement in knowledge can lead to a higher likelihood that the nurse will change their practice behaviors (Masoudi-Alavi, 2014).

### **Source of Evidence**

Sources of evidence regarding successful CAUTI programs would be found through a literature search of CINAHL, Academic Premier, and PubMed databases. Searches considered only articles written in English within the past six years, and search terms include UTI prevention, staff education in infection control, and CAUTI among nursing home residents. Additionally, the literature search included agency resources such as CDC and the Institute for Healthcare Improvement (IHI) CAUTI bundle and CAUTI algorithm. CDC (2017) focuses on proper technique for proper catheter insertion, techniques for catheter maintenance, quality improvement program, surveillance, implementation, and audits. The Agency for Healthcare Research and Quality (AHRQ, 2019) released new evidence-based toolkit that helped in reducing catheter-associated urinary tract infection in the long-term care facilities. The checklist tools include implementation, sustainability, and resources. Education and provision of tools such as checklists for the nurses should improve care by causing a reduction in the infection risk and improve the management of the patient with urinary catheters. This should result in lower infection rates and improved quality of outcomes for residents.

The approach followed Walden DNP manual for staff education in planning, implementation, and evaluation of the program. The education program included an oral presentation, handouts, and hands-on demonstration on practice of proper Foley catheter insertion, maintenance, and removal. Careful handling of urinary catheters is considered



as one of the main responsibilities nursing staff has in caring for patients with urological disorders (Collins, 2013). Education materials were developed and validated by the Agency for Healthcare Research and Quality (AHRQ, 2019), which include validated pre and post knowledge questionnaires. The AHRO pre/post-test evaluated knowledge gain.

This project focused on the comprehensive implementation of AHRQ guideline for CAUTI prevention. The guidelines focused on Foley catheterization care protocols and use bundles of care during insertion, maintenance and removal to help with this disease prevention.

A team of four reviewed the materials and planned the presentation. These experienced nurses assisted with hands-on stimulation training. The education program was a voluntary 3-4 hours presentation, stimulation, and pre/post testing. It was a face to face presentation offered more than once. Per the Kirkpatrick Model (2018) for evaluation of continuing education, the participants were asked to rate the quality of the education program and complete a- pre/posttest of knowledge gain. The Kirkpatrick Model focused on reaction, learning, behavior, and results. The organization's routine continuing education satisfaction tool was used to assess reaction. The effectiveness of educational training was evidence by post-test among staff in caring for patient with an indwelling catheterization and reduction in CAUTI rate will be monitored but this is beyond the scope of this project. The positive social change comes from nurse adherence to the practice guidelines to help in reducing CAUTI cost, morbidity and mortality rates.

The clinical practice was supportive of this project, and they considered this project as part of improving quality measures and facility Institutional Review Board

(IRB) approval was not necessary. This document was submitted to the Walden University IRB per ethical standards and federal United State regulations (Walden University, 2019a). Participants were volunteers, and the purpose of the project explained time commitment. Verbal consent was obtained from each staff, and it was told that it was voluntary participation and can leave any time if chose not to participate.

### **Analysis and Synthesis**

The statistical analysis was conducted using SPSS version 25 paired sample *t*-tests were used to examine difference in pre and post knowledge summary of the staff.

### **Summary**

The goal of the use of clinical guideline is to reduce the mortality, morbidity rate and cost as well as improve patient's quality of life. The effective use of updated AHRQ guidelines in educating the staff on how to use aseptic technique in inserting, maintaining and removal of Foley catheterization will improve quality of care and reduce facility stay and unnecessary use of antibiotics. Section four will provide more on the collection and analysis of evidence.

## **Section 4: Findings and Recommendations**

### **Introduction**

There is a gap that exist in the current practice of caring for patient with an indwelling catheter. The practice-focused question was; Will an educational program on evidence-based clinical practice guidelines for the prevention of catheter-associated urinary tract infections improve the knowledge and self-efficacy of the nursing staff in this facility? The purpose of this doctoral project was to review the source of evidence through the use Walden library databases and deliver education among nursing staff in long term care facility on how to use aseptic technique during Foley catheterization, its maintenance and removal by using AHRQ guidelines

### **Findings and Implications**

The guideline used in staff education was the AHRQ-clinical practice guideline on catheter-associated urinary tract infection (2019). Registered nurses, LPN, and geriatric nursing assistant participated. A total of 48 nurses completed 21 pre-test questionnaire, staff education and post-test questionnaire. The mean pre-test was 73.1524 and post-test score was 90.4143 and the mean average improvement of 17.26190. A paired test showed that there was a significant improvement in each participant's knowledge after staff training as evidenced by overall statistical significance of .006. There was an overall improvement in score test on the questions 1,2,3,4,5,6,7, 8,9,10,11,12,13,14,15,17,18,19, and 21 after the education program regarding the use of clinical practice guidelines in nursing practice. There was 100% score on both pre and

post-test on washing hands before and after manipulation of catheter-this shows that nursing staff are knowledgeable on this aspect.

Table 1 shows five tests on “knowledge regarding catheter placement (gloves use, hand hygiene, insertion and use of aseptic technique)”. Table 2 shows eight tests “knowledge of indwelling catheter maintenance (urinary bag emptying, name identifier, drainage bag disinfection, leg bags, method of periurethral cleaning and urinary bag placement)”. Table 3 shows three tests: “knowledge regarding catheter removal (indication for removal and use of aseptic technique during removal)”. Table 4 shows five tests: “knowledge regarding staff documentation (indication for use, catheter insertion, removal or change, urine color and amount, and hands-off report)”.

Table 1:

*Test Result for Knowledge on Catheter Placement (N=48)*

Numbers	Test questions	Percentage Mean		Pre-test	Post-test	Test statistics and significance
		Answers				
1	During catheter care gloves only need to be worn if you are emptying the urine drainage bag	Agree	68	86	$\chi^2=2.10, P=1$	
2	Hand hygiene does not need to be performed if you are wearing gloves	Disagree	76	100	$\chi^2=3.2, P=1$	
3	Hand washing should be done immediately before and after manipulation of catheter	Agree	100	100	$\chi^2=0, P=1$	
4	Indwelling catheter should be inserted when necessary and removed when not indicated	Agree	78	90	$\chi^2=0.88, P=1$	
5	Indwelling catheter can be inserted with the use of aseptic technique	Agree	62.5	89	$\chi^2=4.63, P=1$	

Table 2:

*Test Knowledge on Indwelling Catheter Maintenance (n=48).*

		Percentage Mean			
Test question	Answer	Pre-test	Post-test	Test statistics and significance	
6	Only trained staff should empty urine drainage bags and rinse/store urine collection containers	Agree	68.5	84.6	$\chi^2=1.69, P=1$
7	If a resident lives in a single-occupant room, there is no need to include their name or identifier on the bath basin or urine collection container	Disagree	66.2	90	$\chi^2=3.6, P=1$
8	It is good practice to disinfect the drainage bag sampling port before obtaining a urine sample	Agree	55	85	$\chi^2=6.4, P=1$
9	Catheters and drainage bags should not be changed at routine, or as schedule	Disagree	72.6	88.9	$\chi^2=1.64, P=1$
10	Leg bags can be used to improve resident comfort, mobility, and/or dignity	Agree	65	90	$\chi^2=4.03, P=1$

	Test question	Answer	Pre- Test	Post- Test	Test statistics and significance
11	The periurethral area should be cleaned vigorously and with a special antimicrobial solution	Disagree	84	100	$\chi^2=1.39$ , P=1
12	Collecting bag should be emptied regularly	Agree	58.8	80.2	$\chi^2 =3.2$ , P=1
13	Collecting bag should be kept below the level of bladder	Agree	66	90	$\chi^2=3.7$ , P=1

Table 3:

*Test knowledge on Catheter Removal (n=48)*

Test questions	Answers	Percentage Mean		Test statistics and test significance
		Pre-test	Post	
14 Urinary catheter should be removed when not indicated	Agree	54.8	90	$\chi^2=8.6$ , P=1
15 The removal of an indwelling catheter involves the use of aseptic technique	Agree	78	90	$\chi^2=0.85$ , P=1
16 Catheter removal should be performed by nurses	Agree	90	90	$\chi^2=0$ , P=1



Table 4:

*Test Results on staff documentation (n=48)*

Test questions	Answer	Percentage Mean		Test statistics and significance
		Pre-test	Post-test	
17 Is indication of Indwelling catheter use properly documented	Indicated	75.2	87.6	$\chi^2=0.92$ , P=1
18 Nurses should document daily catheter care on the patient's chart	Agree	88.8	88.8	$\chi^2=0$ , P=1
19 Nurse should indicate when an indwelling catheter is inserted, removed or changed	Agree	70.8	89.0	$\chi^2=2.1$ , P=1
20 The urine color and amount should be documented	Agree	80.2	89.2	$\chi^2=0.5$ , P=1
Total		1537	1898.2	$\chi^2= 37.9$ , P-1

Staff education on catheter-associated urinary tract infections:

McNemar's  $\chi^2 (a-b)^2 / (b+a)$  test reported with  $\chi^2$  paired t-test (two-tailed) reported with  $t(df)$ . Statistical significance at  $\alpha = .05$

## Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	73.1524	21	11.6521	2.54269
	posttest	90.4143	21	5.35437	1.16842

## Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	pretest & posttest	21	0.576	0.006

## Paired Differences

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df
					Lower	Upper		
Pair 1	pretest - posttest	-17.262	9.62099	2.09947	-21.641	-12.882	-8.222	20

### Recommendations

The proposed recommendation that will close the gap in the clinical practice is the use of AHRQ guidelines and adherence to the protocols when caring for patient with an indwelling catheter during insertion, maintenance and removal. The longer-term follow up will include direct observation by the nurse coordinator using AHRQ guideline checklist with immediate remediation.

- The facility continues to include catheter education with all new hires.
- The facility to continue to provide periodic observation using AHRQ bundle checklist with remediation at bedside or through annual stimulation skills checks.

### **Contribution of Doctoral Project Team**

A gap existed in the current nursing practice of care for a patient with an indwelling catheter, which signified a need for staff education to help reduce the incidence of CAUTI. This was validated after direct observation on how nursing staff care for patients with an indwelling catheter. I coordinated with the facility leader and the educator in providing education on the importance of using AHRQ guidelines for catheter care.

### **Limitations and Strength of the Study**

The strength of this study involves collaboration among the nursing staff in participating with this doctoral project. The use of AHRQ approved LTC guidelines in CAUTI prevention, that was simple to understand and follow. Staff compliance in participating in the education process, pre-test to post-test was high. The use of SPSS version 25 in data analysis to ascertain for accuracy.

The limitation- The stakeholders for this project were mainly the nursing staff. However, medical providers or clinicians' inclusion should be important. Due to the current COVID-19 pandemic, as staff education was performed with two staff at a time while maintaining the social distancing. Long-term monitoring of practice change is recommended.

### **Section 5: Dissemination of Plan**

Reporting of data is vital to ensure that the results are made available to the nursing staff members including the leaders through the staff meeting and as an abstract to the facility monthly Facebook blog. The long-term plan is to present and publish the result on practice change patterns and outcomes for the National Association Director of Nursing Administration in Long-Term and the American Assisted Living Nurses Association.

#### **Analysis of Self**

The key motivation of this project topic was an increased rate of urinary tract infection among those with an indwelling catheter, and the frequency upon which the use antibiotics to treat for this infection was increasing. I began observing how staff perform a procedure on catheter insertion, maintenance, and removal. It was observed that a number of them were not following clinical guidelines. Some staff verbalized that they are not aware of this guideline, while others reported that they want to get their job done and finish in time regardless of the use of protocols.

The role of DNP prepared nurse is to address a practice problem using advanced competencies in the complex practice and engage leadership styles to improve practice and patient outcomes. This project allowed to develop in the following competency areas;

- Development of needed advanced competencies for increasingly complex practice, faculty, and leadership roles;

- Enhanced knowledge to improve nursing practice and patient outcomes;
- Enhanced leadership skills to strengthen practice and health care delivery;
- Provision of an advanced educational credential for those who require advanced practice knowledge but do not need or want a strong research focus (AACN, 2006).

The completion of this project has helped me reach my short-term professional goal which includes staff education and understanding why the use of evidence-based guidelines is essential to clinical practices. It has fulfilled my obligation as a DNP-student as it is a starting point for my long-goal achievement of becoming an educator to ensure that nursing staff and leaders recognizes and follows recommended practices in caring for patients and providing maximum safety and security.

There were few challenges experienced with this project which included; staff resistance. There was initial resistance from the staff which I overcame with more education and teaching on why this is important in their patient's care. Delays-due to present situation of COVID-19, staff education took a longer time than anticipated. The insight gained throughout this journey is understanding each individual's self-perception and level of knowledge with an indwelling catheter care. The clinical practice can be improved through effective teaching using the AHRQ guideline. Better practice in CAUTI prevention can change and improve patient outcomes. The importance of adequate communication skills and staff simulation cannot be overemphasized.

**Summary**

Approximately 75% of UTIs are associated with a urinary catheter (CDC, 2018). Research studies have shown that for each day an indwelling urinary catheter remains, a patient has a 3-7% increased risk of acquiring a catheter-associated urinary tract infection. The occurrence rate in the long-term care facilities among 5%-10% of residents with dwelling urinary catheters. Up to 50% diagnosed with sepsis and 30% experience hospital readmission. Effective staff education using AHRQ guideline can close the gap in nursing knowledge regarding best practice in the LTC clinical practice settings. This should result in better health care outcome for the residents.

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