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Hand Hygiene and Compliance Rates in an Acute Care Setting

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This is to certify that the doctoral study by

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Walden University
2019

Abstract

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MS, Western Governors University, 2016

BS, Western Governors University, 2015

Project Submitted in Partial Fulfillment

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Abstract

Hospital-acquired infections (HAIs) are a significant problem faced by healthcare organizations globally. The Centers for Disease Control reported that in 2014, 722,000 patients acquired an HAI, and of those, 75,000 died as a result. This project focused on reeducating healthcare staff on hand hygiene practices to prevent HAIs. Preintervention hand hygiene compliance rates were compared to postintervention hand hygiene compliance rates on 2 units in an acute care setting to evaluate if reeducation of healthcare staff on hand hygiene protocols and practices would increase hand hygiene compliance rates. The evidence-based practice model used for this project was Nightingale's environmental theory. The research question for the study examined the effectiveness of hand hygiene reeducation on hand hygiene compliance rates. Participants included 97 nurses and ancillary staff. Hand hygiene compliance rates were compared 1 month before and 1 month after healthcare staff reeducation. Results showed an 18% increase in compliance rates following reeducation. These results might effect positive social change by reinforcing that reeducation has an impact on compliance rates for hand hygiene among nursing and ancillary staff in acute care settings.

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Section 1: Nature of the Project

Introduction

Patients enter an inpatient acute care setting for medical treatment or management. Regardless of the reason for entering the hospital, the healthcare team takes on the task of caring for the patient and the responsibility to provide safe patient care, promote healing, and cause no harm. Goals are set for patients on admission, which are evaluated daily to better understand how the patient is progressing, and team members from multiple disciplines work together to meet those goals before discharging the patient. The important goals of inpatient hospitalization are to promote wellness, improve health and healing, provide a safe healing environment, and secure improved patient outcomes.

A safe healing environment is a crucial part of an inpatient acute care setting. It allows for patient progression towards positive health outcomes and return to daily activities and life functions. Healthcare staff play a vital role in positive patient outcomes and the prevention of complications, such as healthcare-associated infections (HAIs). An essential component of preparing to work in a clinical setting as a healthcare provider is the understanding of the infection process and techniques to prevent it (Olin, 2012). According to Lavigne & Curran (2015), many times healthcare staff lack the knowledge of appropriate technique or basic training of proper hand-hygiene protocols to ensure adequate compliance. The World Health Organization's (WHO; 2009) "Clean Care is Safe Care" program has offered various strategies to improve hand hygiene. They are (a) ensuring that healthcare staff has access to alcohol-based hand rub in the patient care

setting, (b) education and training of healthcare staff on the importance of hand hygiene compliance, (c) monitoring and feedback on hand hygiene compliance, (d) visual reminders of compliance in the patient care setting, and (e) creation of a culture of attention to safety within the organization (WHO, 2009). The WHO is leading a global effort to improve hand hygiene compliance, with over 170 nations signed up for the "Clean Care is Safe Care" campaign (Graves et al., 2016).

A magnet-designated hospital in the Southeast uses the WHO's "My 5 Moments for Hand Hygiene" guideline as its adopted hand hygiene tool. The hospital is an 82-bed facility serving the local community. This project focused on reeducating healthcare staff working on the medical-surgical unit and the intensive care unit of the hospital on hand hygiene guidelines.

HAIs are a global healthcare challenge. To be considered healthcare-acquired, infections must be contracted by patients up to 48 hours after hospital admission, up to 3 days after discharge, or up to 30 days after an operation (Stubblefield, 2016). HAIs are one of the most serious patient safety issues in healthcare globally. According to the Centers for Disease Control and Prevention (CDC; 2017a), in 2014 there were an estimated 722,000 HAIs in U.S. acute care hospitals, and about 75,000 patients with HAIs died during their hospitalization, which is approximately 205 deaths from HAIs every day. Because HAIs are not always the underlying cause but rather a contributing cause, HAI-related death rates are difficult to track. According to the CDC (2001), the impact of HAIs can also be examined in terms of years of life that were lost. The median age for patients dying with HAIs is 57 years (CDC, 2001). The results of a study done

between July, 2008, and September, 2011, in a children's hospital by Song, Stockwell, Floyd, Short, and Singh (2013) showed that when healthcare staff were reeducated on hand hygiene practices, compliance increased from 50.3% pre education to 84.0% post education, resulting in savings of $66,397 in hospital charges per month and 11.6 hospital days (Song et al., 2013). Research shows that if health care organizations, doctors, nurses, and other care team members are aware of infection problems and follow specific steps and protocols to prevent them, HAI rates can decrease by more than 70% (CDC, 2017a). According to Aziz (2014), despite the awareness that HAIs cause substantial preventable morbidity and mortality, healthcare staff have a strong tendency to view HAIs as far less of a threat to patient safety than other adverse events such as falls or medication administration errors.

The purpose of this project was to reeducate healthcare staff on the importance of hand hygiene compliance in the prevention of HAIs in an acute care setting. The potential positive social change implications of this project are decreased HAIs resulting in better patient outcomes, eased financial burden on society, decreased healthcare costs, and improved quality care achieved through better hand hygiene compliance among healthcare staff on the two units.

Background

In 2009, The World Health Organization developed evidence-based guidelines on hand hygiene in a healthcare setting to support hand hygiene improvements and thus reduce HAIs (WHO, 2018). The "My 5 Moments of Hand Hygiene" are before patient contact, before an aseptic task, after body fluid exposure risk, after patient contact, and

after contact with patient surroundings. The Southeast hospital adopted in 2010 the WHO's "My 5 Moments of Hand Hygiene" guideline as to when hand hygiene should be performed. These guidelines are taught during hospital orientation, and healthcare staff also must complete a yearly computer-based training program as well as yearly performance hand hygiene check-offs. According to Power & Cole (2017), educators need to be increasingly compelled to consider innovative approaches to teaching and learning strategies because the more traditional forms of skill teaching do not foster essential critical decision-making skills. The more learners are encouraged to incorporate their understanding and knowledge of the underlying evidence base, the better the learning goal outcome will be (Power & Cole, 2017). Shapiro (2018) identified four tips for better learning: (a) encoding, which involves converting perception into meaningful representations; (b) consolidations, which is giving meaning and filling in missing information; (c) retrieval, which is associating memories with diverse cues that allow recall; and (d) effort, which involves a deeper and more enduring learning. Healthcare staff need to fully understand the evidence-based background of the "My 5 Moments of Hand Hygiene" guideline development and statistics to fully understand why compliance is so vital in a healthcare setting.

Problem Statement

The infection preventionist at the Southeast hospital identified a need for reeducation of healthcare staff on specifics of the hand hygiene protocol. Based on daily audits done on the two units, hand hygiene compliance has been as low as 59% in the past 1 month indicating a need in hand hygiene reeducation. The problem being

addressed in the project was hand hygiene compliance in an acute care setting. The goal of the project was to provide hand hygiene reeducation to healthcare staff following the implemented guideline to prevent HAIs.

HAIs remain a major problem that healthcare organizations face daily. Their development can lead to higher mortality and morbidity rates, increased length of hospital stays, and a financial burden for both patients and hospitals. The financial repercussions of HAIs are high. According to the CDC (2017a), the estimated annual direct hospital cost for treating hospital-acquired infections ranges from $28.4 billion to $33.8 billion. Microorganisms present on surfaces and equipment around patients or carried by healthcare staff are a source of HAIs (Helder et al., 2014). Therefore, promoting hand hygiene compliance needs to remain an ongoing effort. Proper hand hygiene is one of the most significant measures for the prevention and control of microbial pathogen cross-transmission and for many infectious diseases a cost-effective intervention (Ford, Boyer, Menachemi, & Huerta, 2014). Preventing HAIs is possible but requires a conscious effort to work toward protecting patients, improving patient care, and saving lives. One way to reduce HAI rates is to further educate healthcare staff on hand hygiene protocols.

Purpose Statement

The purpose of this staff education project was to educate healthcare staff on hand hygiene to prevent HAIs in an acute care setting and to provide recommendations regarding the sustainability of the reeducation initiative after the completion of the project.

The meaningful gap in nursing practice that this educational doctoral project addressed is hand hygiene compliance among healthcare staff in an acute care setting. The guiding practice focus question for this project was:

> PFQ: Will reeducating healthcare staff regarding the importance and significance of hand hygiene help improve hand hygiene compliance rates in an acute care setting?

The gap in practice is addressed through reeducation and the findings are disclosed in proposed measures. Through this project, I developed educational strategies.

Hand hygiene compliance needs continuing education (Kapil, Bhavsar, & Madan, 2015). The display of posters acts as an effective educational tool (Kapil et al., 2015). It is one way to emphasize basic hand washing standards, including when the procedure should be performed, what products to use, description of proper techniques, and appropriate duration of procedure (Szilagyi et al., 2013).

The WHO recommends a multimodal hand hygiene strategy. Successful and sustained hand hygiene improvement is achieved by the implementation of multiple actions to address different obstacles and behavior barriers. I developed hand hygiene educational posters reflecting the latest evidence-based practices and standard protocols using the World Health Organization's "My 5 Moments of Hand Hygiene." (WHO, 2012). Participants were educated on the content of the educational materials: the importance of hand hygiene compliance and its relevance to the prevention of HAIs. Scenario-based education was also used as part of the multimodal approach. Long used in medical education, patient case studies provide examples to learn from. Scenario-based

experience allows healthcare staff to care for virtual patients, make real-time care decisions, and receive immediate feedback through natural consequences. During the educational sessions, a power point presentation was used on the "My 5 Moments of Hand Hygiene." The infection preventionist also attended some of the educational sessions and was involved in sharing hand hygiene facts, statistics, and learning content with staff.

Hand hygiene reeducation is an important aspect of HAI prevention. HAIs are a major health burden and represent a global safety concern (Tartari et al., 2016). It is an epidemic that will continue to be on the rise if changes in hand hygiene compliance are not made. If no changes are made, the best predictor of future incidences remains the past. The CDC is in charge of tracking HAIs, and the data from the years 2014 to 2015 is disappointing. Of the six different HAIs being monitored and tracked, only one infection rate showed a decrease, two infection rates showed no change, while three infection rates increased: catheter-associated urinary tract infections rates showed a 43.0 % decrease, central line-associated bloodstream infection showed a 21.8% increase, surgical site infection-abdominal hysterectomy showed no significant change, surgical site infection-colon surgery showed a 3.3% increase, methicillin-resistant Staphylococcus aureus bacteremia showed a 9.9% increase, and clostridium difficile infection showed no significant change (CDC, 2017c). Based on the WHO (2017) estimate, the annual financial losses due to HAIs are significant. The estimated loss in Europe is 7 billion euros, reflecting 16 million extra days of hospital stay, and approximately $6.5 billion in the United States, reflecting 14 million extra days of hospital stay. Financial

consequences will continue to increase with increased infection rates. It is critical that healthcare staff in the acute care setting are educated on hand hygiene protocols and comply with those protocols to prevent HAIs.

Project Objectives

At the end of the project the following objectives were expected to be achieved:

- To reeducate healthcare staff regarding the importance and significance of hand hygiene practices and compliance to reduce HAIs.
- To compare hand hygiene compliance rates 1 month before and 1 month after the reeducation of healthcare staff regarding hygiene practices.
- To provide recommendations regarding the sustainability of the reeducation initiatives following the completion of the project.

Nature of the Doctoral Project

The sources of evidence collected to meet the purpose of this doctoral project included peer-reviewed scholarly journals, organizational protocols, and evidence-based guidelines gathered from reliable sources, which came mainly from the Walden University Library. I used electronic databases such as CINAHL, Medline, PubMed, and ScienceDirect with key terms such as “healthcare-acquired infections,” and “hand hygiene” to find evidence-based data and information related to the project. The approach that was used to organize the evidence was grouping data by the dependent variable, the indicator of success, which was an increase in hand hygiene compliance, following healthcare provider reeducation on hand hygiene. The approach to analyzing the evidence was the examination of data for relationships, patterns, and trends that could be found in

the evidence collected. The analysis focused on whether there was a significant change in the variable that I was attempting to influence, in this case an increase in hand hygiene compliance rates. The purpose of this doctoral project was to connect the gap in nursing practice through healthcare provider education on hand hygiene compliance to prevent HAIs in an acute care setting.

Significance to Social Change in Practice

Healthcare workers' compliance with hand hygiene is critical in the prevention of HAIs in patient care settings (Vandijck, Labeau, Vogelaers, & Blot, 2010). Key stakeholders in this doctoral project included patients who stand to benefit from a decrease in HAI rates, and healthcare staff who through further hand hygiene education provide higher quality patient care. In addition, the organization stands to benefit financially through reimbursements, decreased costs, increased patient satisfaction, and better patient outcomes.

The goal of this doctoral project was to influence social change by heightening the importance of hand hygiene compliance for healthcare staff to prevent HAIs among patients in an acute care setting. Reeducation is based on the theory of behavioral change at the individual, interpersonal, and organizational levels. At the individual level, hand hygiene reeducation reinforces the right motivation and need for hand hygiene compliance. At the interpersonal level, reeducation of healthcare staff empowers them to improve patient outcomes through the prevention of HAIs. At the organizational level, reeducation includes a shift in the way healthcare staff think about hand hygiene, restructures the organization, and develops appropriate philosophies that support hand

hygiene compliance to prevent HAIs. Increase in hand hygiene compliance is a topic to be addressed in all healthcare settings including doctor's offices, outpatient care, home health, and other areas where patient care is provided. It is an important aspect of quality nursing practice.

Summary

The introduction section of this evidence-based staff education project presents an overview of the need for healthcare provider reeducation on hand hygiene in an acute care setting to help prevent HAIs. HAIs can contribute to negative patient outcomes and higher healthcare costs. According to the CDC (2017), HAIs are a worldwide threat to patients.

Section 2 further details reviewed scholarly evidence on hand hygiene in the effort to prevent HAIs. In this section, I examine the impact of hand hygiene compliance on the prevention of HAIs in further detail.

Section 2: Background and Context

Introduction

The primary goal of this DNP project was staff education. The practice problem was low hand hygiene compliance in an acute care setting. The goal of the project was to provide hand hygiene reeducation to healthcare staff, following the implemented WHO's "My 5 Moments of Hand Hygiene" to prevent HAIs. According to Maroldi et al. (2017), no health service in any country can be considered HAI risk free. Improving health care worker's hand washing practices remains the most effective method to prevent HAIs in a hospital setting. The guided practice focus question for the project was:

PFQ: Will additional education on hand hygiene help healthcare staff better understand HAI prevention and increase hand hygiene compliance?

In Section 2 of the DNP project I examine scholarly literature regarding hand hygiene and HAIs, concepts and theories, the project relevance to nursing practice, local background, my role as the DNP student, and the role of the project team.

Concepts, Models, and Theories

The evidence-based practice model, Florence Nightingale's environmental theory, is the model that was used for this project. It is a theory that changed the face of nursing practice (Petiprin, 2016). Nightingale was one of the first nurses to address the impact of environment on patients (Zborowsky, 2014). She addressed topics such as sanitation, infection rates, ventilation, and how the nurse's presence contributes to patient health outcomes (Zborowsky, 2014). Her environmental theory is a systems model that is focused on the patient. Nightingale stressed physical environment as a very important

contributor to patients' well-being. To promote healing, she emphasized that healthcare staff should maintain a clean and safe healthcare environment (Zborowsky, 2014). Proper hand hygiene is the most important aspect in the reduction of HAIs and was one of Florence Nightingale's main aspects.

The environmental theory could be used specifically for this project by helping participating healthcare staff understand how critical a clean environment is in promoting the healing process. My intentions for the educational project were that patients would remain infection free and could be discharged to continue with their lives. By using the environmental theory, healthcare staff could better understand the goals of the educational project. I used a quantitative analytic method to complete this project: to investigate healthcare staff understanding of and educate staff concerning the connection between hand hygiene compliance and HAIs.

Relevance to Nursing Practice

The main goal of healthcare is to treat, cure, and prevent diseases. Nurses are at the frontline of healthcare and are expected to be diligent in ensuring that patients receive the best possible care with the best possible outcome, allowing for patients to overcome their health challenges (Brownson, Baker, Leet, Gillespie, & True, 2011). The WHO (2009) has acknowledged the importance of hand hygiene in the prevention of HAIs. One example is the "Five Situations" when healthcare staff need to perform hand hygiene: (a) before having any contact with patients, (b) before performing an antiseptic task, (c) after exposure to bodily fluids, (d) after contact with a patient, and (e) after having contact with a patient's surroundings (WHO, 2010). According to the CDC (2017),

approximately 75,000 lives are lost each year due to HAI complications during hospitalization, lives that could be saved if organizations, doctors, healthcare staff, and other healthcare team members followed specific steps and protocols to prevent HAIs. Hand hygiene protocol compliance is as low as 50%; the need to do better is revealed in the numbers (Helder et al., 2014). The gap in nursing practice is the need for nursing and other healthcare provider reeducation on hand hygiene to prevent HAIs in an acute care setting by increasing hand hygiene compliance. Organizations have hand hygiene protocols in place to prevent HAIs, but with compliance rates as low as 50% among healthcare staff, there is a great need for improvement. Reeducation of healthcare staff equips them with further knowledge on the importance of hand-hygiene compliance and its benefits in the prevention of HAIs, which leads to better patient outcomes.

Local Background and Context

Evidence shows that the spread of HAIs in the hospital environment is directly connected to health care professionals who provide care to patients (Ramos de Oliveira Douardo, Barros, Vasconcelos, & da Silva Santos, 2017). The effectiveness of hand hygiene use before patient contact in the prevention of cross infection was first proven in the 19th century (Su et al., 2015). In response to the increased number of HAIs, many educational and informative strategies and campaigns were developed. National hospital campaigns, global healthcare initiatives, and many quality-improvement strategies have been developed to improve hand hygiene compliance among healthcare staff and have led to a savings of up to $2.5 million annually per individual hospitals (Fox et al., 2014). All the efforts that have been made place healthcare organizations on the right track, but with

hand hygiene compliance less than 50% among healthcare staff, there is definite room for improvement to save lives (CDC, 2017b). Maintaining motivation for compliance, sustaining hand hygiene behavior after education, and providing feedback remains a challenge. Too often improvements in compliance are short-term. According to the WHO (2018b), main reasons for noncompliance reported by healthcare staff are: too busy, skin irritation, glove use, and "don't think about it." Another major obstacle for hand hygiene compliance is time constraint (WHO, 2018b). Adequate handwashing with water and soap requires 20 seconds and with alcohol-based hand rubbing the requirement is 20 to 30 seconds (WHO, 2018b). The average time usually adopted by healthcare staff is less than 10 seconds (WHO, 2018b). When digging deeper into the culture and behaviors of healthcare staff on the two units, one observed area of opportunity for improvement was performing hand hygiene after touching the patient environment. One study done by Jackson and Griffiths (2014) suggested that hand hygiene is performed to protect the self, rather than patient, and that a differentiation is made between "known" and "unknown" dirt. It has also been found that healthcare staff perception of patient cleanliness is affected by familiarity, and as familiarity with the patient grows, reluctance is reduced (Jackson & Griffiths, 2014). Literature also indicates that hand hygiene compliance is driven by behavior instead of scientific knowledge of infection control (Jackson & Griffiths, 2014). The level of contamination or interventional task is too often how healthcare staff are motivated to clean their hands. Workers are more motivated to clean hands when performing tasks where there is a higher level of soiling such as visible soil or a known risk of contamination. Certain tasks such as touching a patient or their

environment, bedrails, clothing, patient's skin, or checking blood pressure or temperature are not perceived as a motivating factor to clean hands. According to WHO (2017), one of the most common sources of transmission of infection is environmental surfaces. Certain types of microbial bacteria are capable of surviving on environmental surfaces for months at a time (WHO, 2017). When healthcare staff touch these surfaces the bacteria can be transmitted, causing infection. For this reason, the "My 5 Moments of Hand Hygiene" is the most effective hand hygiene guideline today. Healthcare staff must assess the need to perform hand hygiene based on contamination, going from "dirty to clean." Looking at hand hygiene compliance even further, a study done by Melo et al., (2016) concluded that there is no influence of morning or evening shifts on the performance of hand hygiene by participants. Considering what is at stake, every effort should be undertaken to improve hand hygiene compliance to prevent HAIs. Continuous education is the best way healthcare staff can be reminded of the risk of HAIs associated with hand hygiene noncompliance.

According to the WHO (2017), no health care facility in any country can be considered HAI free. Globally, approximately 10% of patients in hospitals are affected by HAIs, and the death rate among these patients is between 15% to 50%, with the vast majority of these deaths being preventable (Ramos de Oliveira Douardo et al., 2017). In a thorough, systematic analysis of 220 studies in developed countries done by Murni et al. (2013), 4.5 to 7.1 out of 100 patients reported contracting an HAI during their hospital stay. Although mostly preventable, HAIs cause more deaths than AIDS, breast cancer, and car accidents combined (Marques et al., 2017).

There is a lot of information available on hand hygiene compliance and the prevention of HAIs through improved hand hygiene. I conducted a literature review on organizational protocols and evidence-based guidelines gathered from scholarly peer-reviewed studies from reliable sources, mostly through the Walden University Library. I used search engines such as CINAHL, Medline, ProMed, and ScienceDirect with terms such as *HAIs, hospital infections, hand hygiene reeducation,* and *hand hygiene compliance* to find evidence-based data and information related to the project topic. The main themes of this research include hand hygiene practices, compliance, preventing hospital-acquired infections, reeducation as a strategy of improving compliance rates, impact of hand hygiene noncompliance, and reeducation of healthcare staff. Reeducation of healthcare staff in the organization and globally could enhance their understanding of hand hygiene practices and the important role hand hygiene compliance plays in HAI prevention and positive patient outcomes. Patients deserve to be safeguarded from any preventable diseases during their hospital stay; to have a healthy and clean environment that allows a positive progression towards healing. Evidence-based continuing education is a common technique used in healthcare settings to improve clinical practice within the scope of HAI prevention.

Role of the Doctor of Nursing Practice Student

My role as the DNP student was to review literature on evidence-based practice regarding ways to best educate healthcare staff in an acute care setting on hand hygiene practices and compliance and how it relates to HAI prevention. I used a multimodal hand hygiene strategy, as recommended by the WHO, by developing educational posters and a

PowerPoint presentation, using scenario-based education, and holding educational sessions on hand hygiene practices and HAI prevention. My motivation for this project was improving hand hygiene compliance rates to prevent HAIs.

Role of the Project Team

Multiple members of the partner organization oversaw the staff education activities. The infection preventionist at the Southeast hospital guided me in developing the educational sessions and materials based on the units' needs and provided the data collected on hand hygiene compliance 1month prior to and 1 month after the educational sessions. The project team communication and activities were overseen by the principal investigator and me. I developed educational materials and held educational sessions on hand hygiene practices and HAI prevention over a period of 1 week.

Summary

The gap-in-practice identified in this project was hand hygiene compliance, and the purpose of the project was improving hand hygiene practices by reeducating healthcare staff to prevent HAIs. Florence Nightingale's environmental theory was the evidence-based practice model used for this project. Because healthcare staff are the frontline of healthcare, they are expected to be diligent in ensuring positive patient outcomes. Reeducation of healthcare staff equips them with increased knowledge on the importance of preventing HAIs through better hand hygiene compliance. I gathered literature such as organizational protocols and peer-reviewed evidence-based practice guidelines and reviewed it for this project. I collected and reviewed literature, developed hand-hygiene educational materials, and conducted educational sessions on hand hygiene

practices and the role it plays in HAI prevention. Hand hygiene compliance rates were collected for 1 month before and 1 month after the education sessions to evaluate the effectiveness of the project. Information gathered in this section allowed for further expansion of and detail for the project. Section 3 focuses on the collection and analysis of evidence.

Section 3: Collection and Analysis of Evidence

Introduction

HAIs are a global health concern. According to the CDC (2017), an estimated 722,000 HAIs occurred in acute care hospitals, and 75,000 of those patients died during their hospitalization. The purpose of this project was to reeducate healthcare staff on hand hygiene to prevent HAIs in an acute care setting. Section 2 of this project focused on background and context. Topics included concepts and models used for the project, its relevance to nursing practice, local background and context, and the role of the DNP student in this project.

Section 3 centers on the practice-focused question, sources of evidence, and analysis and synthesis of gathered data in more detail relating to hand hygiene and HAI prevention in an acute care setting. This project compared hand hygiene compliance rates for two hospital units before and after hand hygiene reeducation. The two hospital units were a medical-surgical intensive care unit and a medical-surgical floor. Following approval from Walden University Institutional Review Board (approval no. 08-08-18-0736322) and the Organizational Institutional Review Board, hand hygiene compliance rates on the two nursing units were reviewed 1 month before the reeducation and 1 month after the reeducation. The reeducation sessions were held over the course of one week at various times giving all healthcare staff an opportunity to participate.

The problem being addressed in this project was hand hygiene compliance in the prevention of HAIs in an acute care setting. The goal was to provide hand hygiene reeducation to healthcare staff to prevent HAIs. The gap-in-practice that this doctoral

education project addressed was hand hygiene compliance and providing healthcare staff reeducation on hand hygiene to prevent HAIs. The gap-in-practice was addressed through the reeducation of healthcare staff on hand hygiene related to the prevention of HAIs. The purpose of the project was better patient outcomes through infection prevention and increased healthcare provider knowledge on the importance of hand hygiene compliance in an acute care setting.

Practice-Focused Question

PFQ: Will reeducating healthcare staff regarding the importance and significance of hand hygiene help improve hand hygiene compliance rates in an acute care setting?

Definition of Terms

The following italicized phrases or words are defined for this DNP project.

Healthcare providers: A professional licensed member of a healthcare team such as a registered nurse, a medical doctor, an advanced practice registered nurse, a physician assistant, or a nursing assistant. These are professionals involved in providing patient care and are required to follow hand-hygiene protocols to prevent HAIs in an acute care setting.

Healthcare-associated infections: Infections that patients can get in a healthcare facility, a major, yet mostly preventable, patient safety threat (CDC, 2017a). To be considered an HAI, infections must be contracted by patients up to 48 hours after hospital admission, up to 3 days after discharge, or up to 30 days after an operation (Stubblefield, 2016).

Hand-hygiene: The act of cleaning one's hands by either handwashing using soap and water, antiseptic hand wash, or use of an antiseptic hand rub such as an alcohol-based hand sanitizer (CDC, 2017b).

Acute care setting: A setting where patients receive short term medical treatment for conditions such as acute illnesses, recovery from surgery, or an acute injury (WHO, 2013).

Sources of Evidence

Sources of systematic evidence that were collected for the purpose of meeting the requirements for this DNP project included current organizational protocols and evidence-based guidelines gathered from peer-reviewed studies from reliable sources such as the hospital library and the university library. I used search engines such as CINAHL, Medline, and ScienceDirect with search terms such as *HAIs*, *hospital-acquired infections,* and *hand hygiene* to find information and evidence-based data for the project. Data on hand hygiene compliance rates were collected 1 month before and 1 month after the reeducation sessions using the organization's electronic monitoring system. Analysis of the evidence-based data focused on whether there was a significant change in the variable that I was attempting to influence, which in this case was hand hygiene compliance rates following reeducation. The evidence that was collected for this doctoral project assisted me in addressing the gap in nursing practice through the development of additional healthcare provider education on hand hygiene and the reduction of HAIs in an acute care setting. Through this project, educational strategies were developed and used. The practice focused question for this project was:

PFQ: Will reeducating healthcare staff regarding the importance and significance of hand hygiene help improve hand hygiene compliance rate in an acute care setting?

Collection and analysis of evidence on the relationship between the healthcare provider reeducation on hand hygiene and the healthcare staff's understanding of HAI prevention following nursing reeducation provided the appropriate way to address the practice focused question. It was a way to show that the evidence was clear, strong, present, and that a change was needed in hand hygiene habits among healthcare staff when HAI prevention is the goal.

Participants

The individuals who participated in the educational sessions were nursing and ancillary staff including respiratory, physical, occupational, and speech therapists, as well as dietary, transport, laboratory, and housekeeping. The inclusion criteria for those chosen to participate in the project were healthcare staff and ancillary staff who provide patient care and perform routine hand hygiene; either by using soap and water or alcohol-based sanitizer before and after providing patient care. Activities that do not require hand hygiene were the exclusion criteria for this DNP project.

Procedures

Hand-hygiene posters, a PowerPoint presentation, and scenario-based education were developed as part of the reeducational session by me based on the WHO's "My 5 Moments of Hand Hygiene" guidelines adopted by the organization in 2010. Participants were reeducated on the importance of hand hygiene compliance and its relevance to the

prevention of HAIs. All participants were given the opportunity to ask questions related to data gathered on the DNP project topic, including statistics. Table 1 contains the demographic characteristics of the DNP project participants measured.

Table 1

Demographic Characteristics of the Participants

Characteristics	Number
Registered nurses/ Nursing assistants	73
Therapists (respiratory, physical, speech, occupational)	28
Ancillary (transport, dietary, lab, housekeeping)	81

Protections

Participants in this doctoral project were chosen based on the hospital unit they work on. There were 182 registered nurses, nursing assistants, therapists, and ancillary staff working on the medical-surgical and ICU units. Each participant was informed that their participation in the project was not required and was voluntary. No confidential information was gathered during the study. Participants were reeducated on hand hygiene practices and the prevention of HAI.

Analysis and Synthesis

Direct observation, which has been the golden standard of hand hygiene compliance data collection, has been shown to be skewed and flawed due to the Hawthorne effect. The Hawthorne effect, also known as the observer effect, is a type of reactivity in which an individual modifies an aspect of their behavior in response to their

awareness of being observed. Many healthcare organizations have moved towards collecting hand hygiene compliance data electronically.

Hand hygiene compliance data was collected using an electronic monitoring system. The monitoring system was developed through the collaboration of scientists, researchers, and engineers along with healthcare leaders from medical, research, infection prevention, and quality management specialties. Through the monitoring system, leaders can measure compliance rates and share that information. Product usage data is collected and transmitted wirelessly every time a hand sanitizer dispenser or a hand soap dispenser is used. The monitoring does not require any special activity by healthcare staff. Data is transmitted electronically to the corporation's servers and is only available to authorized hospital staff. Compliance rates are calculated according to a developed algorithm based on the expected number of hand hygiene occurrences by unit type and for specific times of day and days of the week. By dividing the number of opportunities into the number of activations, the Hand Hygiene Compliance Index, also referred to as the rate, is calculated. Hand hygiene compliance data is printed out and shared daily on the two units.

Data was collected on a medical-surgical intensive care unit and a medical-surgical floor. The Hand Hygiene Compliance Index for the small Southeast hospital is combined for the two nursing units to stabilize the compliance rate due to variation in census. The medical-surgical intensive care unit has eight beds and the medical-surgical floor unit has 36 beds. Patients on these two units come from all backgrounds and are at risk for infections such as central line-associated bloodstream infections, catheter-

associated urinary tract infections, surgical site infections, ventilator-associated pneumonia, Methicillin-resistant Staphylococcus aureus, Vancomycin-resistant enterococci, Clostridium difficile, Escherichia coli, as well as others such as fungal infections and skin infections.

The data analysis was an evaluation of whether hand hygiene compliance rates increased following healthcare staff reeducation. Data was collected 1 month before and 1 month after the reeducation sessions from the electronic monitoring system. The mean rates of hand hygiene compliance were estimated using descriptive statistics. Recommendations were made regarding the outcome of reeducation.

Summary

Section 3 of this doctoral project included collection and analysis of evidence. I introduced the topic of this project and restated the practice-focused question. I defined terms frequently used in this DNP project and explained in detail how sources of evidence were gathered. I identified the participants in the study along with the procedures that were followed. I developed educational materials, and during educational sessions, participants were reeducated on hand hygiene and the prevention of HAIs. I informed participants that no personal identifiers were used during the project. After the education was completed and hand hygiene compliance data was gathered, the next step was to disclose findings and recommendations, both of which will be covered in Section 4.

Section 4: Findings and Recommendations

Introduction

Poor hand hygiene compliance in an acute care setting is associated with increased risk of HAIs and death of patients. Patient safety is a priority and improving hand hygiene compliance rates is an effective way to reduce the risk of patients being exposed to or contracting an HAI. According to the CDC (2017a), the estimated cases of HAIs in the United States for 2014 were 722,000, and 75,000 of those patients died as a result of their infection. With hand hygiene compliance as low as 50%, HAIs remain a global challenge.

This project focused on addressing hand hygiene compliance among healthcare staff in an acute care setting. The practice focused question was:

> PFQ: Will reeducating healthcare staff regarding the importance and significance of hand hygiene help improve hand hygiene compliance rates in an acute care setting?

The purpose of this staff education project was to reeducate health care staff on hand hygiene to prevent HAIs in an acute care setting and to provide recommendations regarding the sustainability of the reeducation initiative.

Sources of evidence that I collected for this project included organizational protocols and evidence-based guidelines gathered from peer-reviewed studies from reliable sources such as the hospital library and the university library, I used search engines such as CINAHL, Medline, and ScienceDirect. I collected data on hand hygiene compliance rates 1 month before and 1 month after the reeducation sessions using the

organization's electronic monitoring system. Analysis of the data focused on whether there was a significant change in hand hygiene compliance rates following reeducation. I estimated the mean rates using descriptive statistics.

Findings and Implications

The site for this project was an 82-bed magnet-designated hospital in the Southeast. Participants included all nursing and ancillary staff who care for patients on the medical-surgical intensive care unit and a medical-surgical floor. Of the 182 anticipated participants, a total of 97 participated. The reeducation was based on the WHO's "My 5 Moments for Hand Hygiene" guideline adopted by the organization. Hand-hygiene posters, a PowerPoint presentation, and scenario-based education were used as tools for the multi-modal reeducation sessions. Sessions were held during both day and night shifts for one week allowing an opportunity for all participants to attend. Hand hygiene compliance rates were reviewed for 1 month before the reeducation and 1 month after the reeducation. The pre-education mean rate was 63% and the post-education mean rate was 81%. The results showed that the educational intervention did elicit a statistically significant change in hand hygiene compliance rates with an increase of 18%.

One unanticipated limitation of the project was the number of participants. I covered both day and night shifts as well as announced hand hygiene sessions overhead throughout the hospital during the week, but the final participation was 54%. During the planning stage the project team, which included the infection preventionist, set the minimum participation goal at 50%, which would provide a reasonable starting point for

the project to be considered successful, and the goal was narrowly surpassed. Hand hygiene compliance rates increased after the reeducation and sustained for the month data was collected.

Implications resulting from an increase in hand hygiene compliance rates among healthcare staff include higher quality patient care, a decreased risk of patients acquiring HAIs in an acute care setting resulting in a healthier community, and financial benefits for the organization through reimbursements, decreased costs, increased patient satisfaction, and better patient outcomes. The objectives of this doctoral project were to reeducate healthcare staff regarding the importance of hand hygiene practices and compliance to prevent HAIs and to provide recommendations regarding the sustainability of the reeducation initiatives. The following goals and outcomes were met for this project: (a) develop an evidence-based multimodal hand hygiene reeducation curriculum for healthcare staff, (b) develop an evaluation plan, (c) carry out the educational sessions over a 1 week period for both day and night shift for both unit staff and ancillary staff, (d) compare hand hygiene compliance rates month before and 1 month following reeducation of staff, and (e) provide recommendations regarding the sustainability of the reeducation initiatives following the completion of the project.

Potential implications for positive social change resulting from an increase in hand hygiene compliance rates include higher quality patient care, increased patient satisfaction, and a decrease in HAI rates resulting in a decrease in economic burden for organizations, patients, and the community.

Recommendations

According to the gathered data, hand hygiene compliance rates increased by 18% following healthcare staff reeducation. After multiple meetings and discussions, I along with the team proposed solutions that will potentially address the lack of hand hygiene compliance. The first recommendation was to discuss hand hygiene compliance rates daily in the Safety Huddle following the multi-modal education, making it a daily focus. The infection preventionist along with the nurse manager will evaluate compliance rates by the hour and will conduct additional counseling to the staff working during the shifts when compliance rates are low. The organization has implemented both recommendations into their daily practice in the effort to sustain the higher compliance rates seen following reeducation.

Contribution of the Doctoral Project Team

Multiple members of the organization participated in the completion and success of the doctoral project. The principal investigator planned and organized all communications among team members, approved educational materials, and supervised all activities. The infection preventionist made the recommendations for the educational materials based on the needs of the units and participated in some of the educational sessions with me. I developed a multimodal educational plan and held a week-long educational fair with one-on-one educational sessions on hand hygiene practices and HAI prevention over a period of 1 week. Each member of the project team was involved in the development of the final recommendations made to sustain hand hygiene compliance rates on both units.

Strengths and Limitations of the Project

Strengths:

One strength of the project was the inclusion of ancillary departments including respiratory therapy, physical/speech/occupational therapy, laboratory, dietary, housekeeping, and transport. Also, the available evidence-based literature on hand hygiene compliance and HAI prevention was in abundance, and the extensive searches of multiple databases that focused on the project topic contributed to the strength of the project. Additionally, the data gathered using the electronic monitoring system adopted by the organization was reliable, sufficient, relevant, and up-to-date, which helped in drawing sufficient conclusions about the results. Another strength of the project was teamwork. Each team member was equally invested in the success of the project.

Limitations:

One identified limitation of the project was not including the physicians in the reeducation. Another limitation was that 46% of the healthcare staff did not participate in the reeducational sessions. According to the WHO (2009), factors for improved compliance among healthcare providers are education and training. Healthcare staff who do not participate in education are more likely to continue same hand hygiene patterns and behaviors (WHO, 2009).

Section 5: Dissemination Plan

Dissemination

Disseminating scholarly work shares the results of the project to enhance nursing practice and healthcare outcomes and is essential for advanced practice nurses. Being able to effectively use, contribute, and communicate knowledge to other nurses, interdisciplinary teams, policy makers, and the public via publications such as presentations, posters, journals, and interviews is paramount for the nursing profession (Hanrahan, Marlow, Aldrich, & Hiatt, 2010). The dissemination of this DNP project findings occurred through a variety of methods. The hand hygiene compliance data and results were shared with the nurse managers of the two units through e-mails, meetings, and presentation. The administration, infection preventionist, and infection prevention director of the hospital received the findings in a written report and speaker presentation. The results of the project have also been shared with the healthcare staff through an in-service.

To disseminate the findings of this doctoral project to the broader nursing profession, the audiences and venues that would be appropriate include the organization's monthly news journal, and the *Journal of Nursing Education and Practice.* These are two publications with an audience that is tailored for the information resulting from this doctoral project.

Analysis of Self

My long-term goal is to become a nurse educator who makes a difference by teaching the latest evidence-based practices to nurses who are at the bedside. Throughout

the DNP program, as well as the field experience, I learned a great deal about nursing management, leadership, staff education, and patient outcomes. My mentor was great at providing guidance throughout the field experience and making sure that I was involved in all levels of management, leadership, and staff education.

Practitioner

As a practitioner, this DNP project contributed to increased knowledge of patient safety and the importance of hand hygiene compliance among healthcare staff. I have discovered that there is a need for ongoing hand hygiene education to inform and remind healthcare staff of organizational protocols, and the negative outcomes of noncompliance with those protocols. It is essential for a practitioner to relate the act of hand hygiene with the indications outlined and explained in organizational policies.

The completion of this doctoral project has increased my understanding and knowledge of the process to design an initiative to improve clinical practice and possibly influence health policy.

Scholar

As a scholar, this DNP project has helped enhance my overall literature review, research, and data analysis skills. It has also helped me better understand the importance of using scholarly, peer-reviewed evidence-based information and research to rely on for the latest in nursing practices. I have learned how to develop an educational curriculum plan for a broad audience and carry out that plan successfully. During the completion of the DNP program, I have acquired a better understanding of recognizing problems in the

practice setting, addressing those problems, and identifying avenues to solve those problems built on evidence-based practice.

Project Manager

As a project manager, I learned how to work with a team in a way that gave each team member a voice and allowed each team member to contribute their expertise and specialty to the positive outcome of the project. I also learned how to use feedback positively and effectively. The project allowed me to learn how to plan, coordinate, and carry out a successful educational curriculum and how to gather and analyze data.

One of the areas in which I significantly improved was the process of conducting a study in a large organization: the steps to go through, obtaining approval from different departments and leaders, following organizational guidelines through the process, and carrying out the educational sessions within the requirements of both the organization and the university.

Carrying the project to completion came with many challenges that I successfully overcame and learned from. Some of the challenges included time management, the organizational approval process, and coordination of all team members involved. Healthcare staff participation was a challenge as well due to issues with staffing and time management. I have gained great insights from completing a DNP project such as the need to work as a part of a team, patience with the organizational processes that are in place, how to better positively communicate with leaders and staff regarding the need for hand hygiene reeducation and compliance, and what it takes to become a confident and effective leader.

Summary

The purpose of this educational project was to reeducate healthcare staff on hand hygiene to prevent HAIs in an acute care setting and to provide recommendations regarding the sustainability of the reeducation initiative after the completion of the project. Literature has shown that hand hygiene compliance needs continuing education and a multimodal approach is recommended (WHO, 2010). HAIs remain a significant healthcare burden and represent a global safety concern to both patients and healthcare providers (CDC, 2017a). The goal was to influence social change by heightening the significance of hand hygiene compliance among healthcare staff to prevent HAIs and improve patient outcomes.

I developed a reeducational plan on two units of a magnet-designated hospital in the Southeast based on the WHO's "My 5 Moments for Hand Hygiene" guideline adopted by the organization. Hand hygiene compliance rates were as low as 59% prior to the educational fair and showed significant improvement following the education. A total of 97 healthcare staff members participated.

Hand hygiene is the most effective way to prevent HAIs (WHO, 2010) and evidence from this study shows that staff reeducation is necessary and effective in maintaining compliance rates among healthcare staff.

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Appendix A: Project Poster

5 Moments of Hand Hygiene

Clean Your Hands:

1. **BEFORE TOUCHING THE PATIENT**
   When? Clean your hands when approaching patient, before touching him/her.
   Why? To protect patient from dangerous germs carried on your hands.

2. **BEFORE CLEAN OR ASEPTIC PROCEDURE**
   When? Immediately before performing any clean/aseptic procedure.
   Why? To protect patient from harmful germs, including their own, from entering the body.

3. **AFTER BODY FLUID EXPOSURE RISK**
   When? Immediately after and exposure to bodily fluids (and after you remove your gloves).
   Why? To protect yourself as well as the environment from harmful germs patient carries.

4. **AFTER TOUCHING A PATIENT**
   When? Immediately after touching patient, his or her surroundings, and when leaving the room.
   Why? To protect yourself as well as the environment from harmful patient germs.

5. **AFTER TOUCHING PATIENT SURROUNDINGS**
   When? Immediately after touching any object in the patient's immediate surroundings or in patient's room (even if the patient has not been touched).
   Why? To protect yourself and the healthcare environment from dangerous germs and from spreading germs to others.

   World Health Organization (2012).

Appendix B: Intervention Rates and Results

Mean Pre-intervention rates	Mean post-intervention rates	% of increase
63%	81%	18%

Appendix C: Weekly Rates Before and After Intervention

Weekly pre-intervention rates	Weekly post-intervention rates
Week 1- 0.692	Week 1- 0.70
Week 2- 0.609	Week 2- 0.839
Week 3- 0.591	Week 3- 0.908
Week 4- 0.627	Week 4- 0.809