ASSOCIATION BETWEEN HAND HYGIENE AND HOSPITAL ACQUIRED INFECTIONS (HAI): A PHENOMENOLOGICAL STUDY AT A SOUTHEASTERN STATE HOSPITAL

by

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Abstract

Greater awareness regarding healthcare-associated infections (HAIs) has drawn in a great deal of attention from the government at the local, state, and federal level as well as from the general public and medical insurance companies such as Medicaid and Medicare. This level of attention is the product of heightened interest in the quality of healthcare and the realization that most HAIs can be averted. Healthcare organizations and medical providers worldwide continue to observe exceptional developments in the comprehension of the physiology of uncommon or disease-causing agents and increased transmission of multidrug-resistant organisms in healthcare facilities both nationally and internationally. Such circumstances have prompted the re-examination of fundamental infection prevention processes in healthcare facilities. Evidence-based research has linked hand hygiene compliance to decreased nosocomial infections. With the World Health Organization (WHO) leadership and guidelines on hand hygiene in healthcare and patient safety initiatives, healthcare facilities must focus on compliance in hand hygiene practices. It is inexpensive, simple and it can save many lives.

Dedication

I dedicate my dissertation achievement to my family and close friends. A deep feeling of appreciation to my wife, Gemyma Fan, and sons, Brandon Fan and Christian Fan, whose words of comfort and support kept me on the path to success. I also dedicate this dissertation to my church family who has encouraged me for the duration of the doctorate program. I will forever be grateful for all the prayers and countless words of encouragement that enabled me to press forward in completing this research study with joy.

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CHAPTER 1. INTRODUCTION

Introduction to the Problem

Hospital-acquired infections (HAI) such as Methicillin-Resistant Staphylococcus Aureus (MRSA) and Clostridium difficile (C. diff) continue to be a great concern to patients, their loved ones, and healthcare professionals. Approximately 99,000 patients succumb to HAIs in United States hospitals annually and nearly 5 billion dollars is spent in excess healthcare related expenses annually (Lobdell, Stamou, & Sanchez, 2012). According to Monistrol et al. (2012), thorough and consistent hand hygiene when caring for patients is an action that can be taken to help protect patients, staff members, and visitors from HAIs. This action research project will assess nursing staff hand hygiene practices in the research site. Nurses have hands-on daily contact with patients and therefore play a significant role in infection prevention and with that fact in mind this research study will help understand nurses' hand hygiene practices, their attitudes toward these practices, as well as barriers that may exist in carrying out hand hygiene compliance at the research site.

Background of the Study

As HAIs become frequent and the mortality associated with them increases, governmental organizations, such as the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), state health departments, Medicaid, Medicare, the media, and the general public, have acknowledged the importance of effective HAI prevention (Stone et al., 2010).

Sickbert-Bennett et al. (2016) state that hand hygiene is the most effective and recommended measure in preventing transmission of diseases that can be acquired by

contact with bodily fluids, mucous membranes, and non-intact skin (i.e., cuts, rashes). Research has shown that healthcare units with high hand hygiene compliance have experienced lower infection rates (Sickbert-Bennett et al., 2016), and hand hygiene is recognized and supported by many evidence-based research studies as a key intervention in controlling and preventing infection rates in healthcare settings (Aragon, Sole, & Brown, 2005). This qualitative research study took place at the research site's Hematology/Oncology units. Overall, the research site is the main campus and treats over 200,000 patients annually. The Oncology units at the research site treat approximately 2,500 newly diagnosed cancer patients annually.

Although the research site's Hematology/Oncology units provide treatment to immunocompromised patients, they are still required to monitor and report HAIs. Healthcare facilities in the United States are required by law to report HAI data to the CDC's National Healthcare Safety Network (NHSN) not only to fulfill the Centers for Medicare & Medicaid services (CMS) hospital inpatient quality reporting requirements but also to keep track of infection data.

Failure to report HAI data and the reporting of increased HAI rates can result in penalties and/or affect reimbursement for adverse health conditions that occur during the hospital stay and are not present on admission (Hoff et al., 2011). The CDC/NHSN utilizes the Standardized Infection Ratio (SIR) to track HAIs over time at the national, state, and local level. The SIR provides the government the means to compare tangible HAI numbers at each hospital to the expected number of infections (Saman, Kavanagh, & Abusalem, 2013).

Calculation of the SIR: $SIR = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$

The SIR is calculated only if the number of expected HAIs is ≥ 1 in order to help to set the lowest possible precision benchmark. At the research site, the CDC/NHSN also determines the Standardized Infection Ratio (SIR) for HAIs and it is set at the 25th percentile (Facility-specific SIRs at Key Percentiles) with a Value-based Purchasing threshold of ≤ 0.799 for MRSA and ≤ 0.750 for C. diff.

Based on C. diff and MRSA SIR data for October 2015 through March 2016, the research site has reported at least one hospital-onset of both MRSA and C. diff for Quarter Four, 2015 and Quarter One, 2016. Based on the number of MRSA and C. diff infections identified by the research site and the number of inpatients reported to the CDC/NHSN, for Quarter One, 2016, the research site has a SIR of 1.00 for MRSA and a SIR of 0.47 for C. diff. The hospital had a SIR of 0.81 for MRSA and a SIR of 0.90 for C. diff HAIs in the previous quarter.

The HAI data for C. diff and MRSA at the research site displayed in Appendix B also demonstrates that the SIR goals set by the government for both infections were not met for a period of six months; the colored circles represent the status of HAI SIR for a given period (i.e., monthly, quarterly, annually).

Red Circle

SIR expected value is higher than the goal appointed by the CMS for a three month period.

Yellow Circle

SIR expected value is close to the goal appointed by the CMS for a three month period.

Green Circle

SIR expected value is lower than the goal appointed by the CMS for a 3-month period.

One infection is enough. The internal research site's goal is to have zero infections and the best way to work towards that goal is to understand hand hygiene compliance and how it plays a role in HAIs.

HAIs are great contributing factors towards mortality in healthcare facilities. Although HAIs are preventable, they affect 1 in 20 patients in hospitals throughout the United States (CDC, 2016). In 2016, the CDC reported an estimated 722,000 HAIs in acute care hospitals in the United States, and 75,000 patients died due to HAIs while admitted in hospital settings that year (see Table 1).

The statistical data provided by the CDC and the struggles of healthcare organizations nationwide to decrease HAIs are more than enough to consider a great need for HAI awareness and increased hand hygiene practices in clinical settings. Hand hygiene is regarded as an effective strategy for HAIs (Sickbert-Bennett et al., 2016). Many research studies on hand hygiene serve as evidence that it is an effective strategy against HAIs.

Table 1

2011 Hospital-Acquired Infection Rates in the United States.

HAI Estimated Occurring in US Acute Care Hospital, 2011.

Major Site of Infection	Estimated No.
Pneumonia	157,500
Gastrointestinal Illness	123,100
Urinary Tract Infections	93,300
Primary Bloodstream Infections	71,900
Surgical Site Infections Other types of infections	157,500
Other types of Infections	118,500
Estimated total number of infections in hospitals	721,800

From HAI Data and Statistics, by Center for Disease Control and Prevention, 2011, U.S. Department of Health & Human Services. Copyright 2011 by Center for Disease Control and Prevention. Adapted with permission.

For example, a prospective cohort study by Barrera, Zingg, Mendez, and Pittet (2013) performed in six intensive care units from January 2001 to December 2005 demonstrated that increased and appropriate hand hygiene with the use of alcohol-based hand rubs among nursing staff members reduced central line-associated bloodstream infection rates approximately 12.7% per year. Another research study conducted in a tertiary hospital demonstrated that after a WHO multimodal hand hygiene promotion campaign was introduced (i.e., the use of alcohol-based hand rubs, soap and warm water for visibly soiled hands, and C. diff), HAI rates decreased. The hospital saw 73.3% hand hygiene compliance in 1 year and a 1.5% decrease in infection rates (Chen et al., 2016).

Hand hygiene compliance among healthcare professionals who directly care for patients, such as nurses is not always adequate. Polat, Gürol, and Çevik (2011) argued that during an observational study consisting of 72 nurses working in neonatal intensive care units in two cities, it was found that most of the nurses washed their hands, but used alcohol-based hand rubs much less frequently because they prefer the use of soap and water; more than half of the nurses did not use gloves and more than 20% did not wash their hands before providing care for their patients. Approximately 1/3 of the nurses that were part of the study did not wash their hands after providing neonatal care and treatment.

Based on the literature, there is room for improvement in regards to nursing staff members' hand hygiene compliance. Adherence and consistency to hand hygiene guidelines such as the WHO's 5 Moments for Hand Hygiene in healthcare facilities enable infection prevention and control. A study conducted in a surgical intensive care unit (ICU) to examine nurses hand hygiene compliance revealed that in a period of 12 months, nurses' adherence rate to hand hygiene fared the worst for moment one and two (perform hand hygiene before touching a patient and before aseptic procedures) of the 5 moments for hand hygiene (Shukla, Chavali, & Menon, 2014). This cross-sectional observational study used direct observation as their approach. Of the 38 healthcare workers that were included in the research study, 28 of the group were nurses.

During the investigation, the researcher observed 1,500 hand hygiene opportunities when applied to the WHO's 5 Moments for Hand Hygiene. As a whole, the group's hand hygiene compliance was 73.6%. However, the 28 nurses' hand hygiene

adherence rate to hand hygiene was 63%. In order to maximize the reduction of preventable HAIs in healthcare facilities, hand hygiene adherence must increase.

Statement of the Problem

There is a need for more research on nurses' hand hygiene compliance; not only because of the importance of the issue in regards to mortality, morbidity, and increased cost to healthcare facilities, but also because of increased awareness that most healthcare acquired infections can be averted with strategies as simple as hand hygiene (Mathur, 2011). According to Mathur (2011), there is now undeniable evidence from the literature that stern and consistent practice of hand hygiene decreases the risk of infections. The reported HAI rates for the research site from October 2015 to March 2016, specifically with C. diff and MRSA were above the CDC's SIR goals. Based on C. diff and MRSA SIR information for October 2015 through March 2016, the research site has disclosed at least one hospital-onset of both MRSA and C. diff for a period of six months. Based on the SIR goals that the government has set for hospitals throughout the nation for HAIs such as MRSA and C. diff, the research site did not meet the goal. The hospital could benefit from a research investigation that strives to determine and address possible gaps in hand hygiene practice.

Purpose of the Study

Nurses have hands-on daily contact with patients, and therefore play a significant role in infection prevention. The purpose of this qualitative phenomenological research study is to understand nurses' hand hygiene practices, their attitudes toward these practices, as well as barriers that may exist in carrying out hand hygiene compliance at the research site's Hematology/Oncology units. This research study also aims to provide

the research site's Hematology/Oncology nursing staff, nursing staff leadership, and infection prevention leadership with a summary of the study's results.

Rationale

Good hand hygiene is one of the easiest and most important actions that healthcare professionals can carry out to decrease the overall spread of infectious diseases and safeguard the health of patients (Tippin, 2015). By investigating nurses' hand hygiene practices and their attitudes about these practices, as well as any barriers that may exist in being hand hygiene compliant, a better understanding of nurses' experiences with regard to hand hygiene at the research site will be gained and could inform hospital policies and contribute to lowering incidents of HAIs.

Research Questions

The research questions guiding this study are:

RQ_1: What are hand hygiene practices of nurses at the research site?

RQ_2: How are hand hygiene practices for nurses being encouraged and/or enforced by clinical leaders?

RQ_3: What are barriers for nurses in carrying out hand hygiene practices?

RQ_4: How are the attitudes of nurses impacting hand hygiene practices?

Significance of the Study

There is a need to understand and improve nurses' hand hygiene compliance because research has shown that hand hygiene is the most simple and most cost effective strategy that can decrease hospital-acquired infections (Mathur, 2011). HAIs take a toll on patients, their loved ones, hospital staff members and society, physically, mentally, and financially (Reinhard, Given, Petlick, & Bemis, 2008). With increased mortality

rates, healthcare costs and length of stay, this action research study helped understand hand hygiene practices in an effort to prevent nosocomial infections and decrease the medical costs and mortality rates associated with it. The research site's current practice of hand hygiene consists primarily of strategically placing hand hygiene sanitizer dispensers (alcohol-based foam hand rubs) throughout the hospital.

This research project may improve current hand hygiene practices at the research site by monitoring and reporting hand hygiene habits on the unit(s) with the highest HAI rates. The successful completion of this research project may not only increase compliance with hand hygiene practices at the research site, but may also impact the field of public health by reducing the spread of HAIs. Overall this research project may impact the research site positively by helping to decrease their HAI rates and increase quality healthcare.

Definition of Terms

C. diff. Is a bacterium that causes infectious diarrhea; the bacteria live in most people's intestines.

HAIs. Infections that patients fall victim to while receiving medical care at healthcare facilities.

Hand Hygiene. The process of cleaning hands with soap and water, alcohol foam hand sanitizers to prevent the spread of germs.

MRSA. A bacterial infection that is resistant to different types of antibiotics including methicillin.

Nosocomial infection. Microorganisms or toxins that live in a certain site, such as a hospital.

Standard Infection Ratio (SIR). A standard statistic used to track healthcare facilities infections overtime on the national, and state level.

NVivo. A computer data analysis software that is fashioned for qualitative research that engages deep data analysis.

Assumptions and Limitations

This research study took a phenomenological approach; therefore philosophical assumptions of phenomenology can include the following: A single phenomenon is identified, that the phenomenon is experienced by different people and that people are conscious of their experience as part of the identified phenomenon (Creswell, 2013). This approach, with its assumptions, aligns with the research topic and research questions since there is a single, central phenomenon identified (hand hygiene practices of nurses), and it is experienced by different people (nursing staff) who presumably are conscious of their experience as part of hand hygiene practices at the research site.

A familiar limitation in qualitative research studies is the limitation on generalizability (i.e., the degree to which the findings can be generalized from the study sample to the entire population— all nursing staff in the case of this research study) due to small sample size. Limitation on generalizability cannot be altered or improved due to the nature of the study; therefore, it is an acknowledged limitation, with the understanding that the research study results will depict the views of a small sample of the population and cannot be generalized to all nursing staff. In cases where an in-depth understanding of a phenomenon such as hand hygiene practices is required, a small qualitative study such as this one can benefit more personal awareness and understanding

of hand hygiene practices and the results can be valuable to the research site's nursing staff and stakeholders.

Theoretical/Conceptual Framework

The theoretical perspective that serves as the backbone of this action research project is the theory of reasoned action. This particular theory suggests that strong intentions can result in increased attempt to execute a behavior, which also increases the probability of the behavior to be performed (Banerjee, Siriwardena, & Iqbal, 2011). According to the *Encyclopedia of Public Health*, the theory of reasoned action proposes that a person, who believes behavior (i.e., compliance) points to a positive conclusion, holds a favorable mental outlook, and therefore is much more inclined to carry out the behavior (Morisky, 2002).

Organization of the Remainder of the Study

The remaining chapters serve as a statement of the main points of this research study's data collection, analyzing and reporting process, recommendation and conclusion. Chapter 2 presents examined provides important information and critical assessment of the association of hand hygiene and hospital acquires infections in healthcare facilities, challenges with compliance, hand washing techniques, theory of reasoned action, benefits of hand hygiene, and summary.

Chapter 3 discloses the research study's research design, sample information, instrumentation/measures, data collection, data analysis and ethical considerations. Chapter 4 reveals a qualitative example of this research study's data with clear and concise discoveries from hand hygiene observations and face-to-face interviews that were significant in answering the research questions. Conclusively, Chapter 5 provides a

review of the research study's ramifications, significance, and recommendations for improved practice.

CHAPTER 2. LITERATURE REVIEW

The goal of this qualitative phenomenological research study was to understand nurses' hand hygiene practices, their attitudes toward these practices, as well as barriers that may exist in carrying out hand hygiene compliance at the research site. This research study was able to provide an in-depth understanding of the current situation with regard to nurses' hand hygiene at the research site.

In the review of the literature, five major themes are explored: (a) the impact of hand hygiene on the reduction of HAIs in healthcare facilities, (b) hand hygiene in healthcare settings, (c) nurses' attitudes towards hand hygiene, (d) hospital culture and HAIs, and (e) healthcare facility barriers.

In addition to the aforementioned key literature review points, this chapter concludes with the necessary measures needed to improve hand hygiene compliance. The key terms identified in the search of the empirical literature for this research included:

- Evidence-based research on hand hygiene use in the prevention of HAIs;
- Infection control measures in preventing HAIs;
- Research studies on compliance with hand hygiene;
- Alcohol-based hand rubs in the prevention of HAIs;
- Hand hygiene practices in healthcare settings;
- Identify the different strategies used in healthcare facilities to increase thorough hand hygiene practices;
- nurses' understanding, approach and point of view regarding hand hygiene;

- possible barriers that interfere with proper hand hygiene practices;
- Determine the effectiveness of the 5 moments for hand hygiene;
- Discuss the recent hand hygiene research studies.

The literature was accessed through the EBSCOhost Research Databases, Google Scholar, and PubMed Central: An Archive of Life Science Journals databases, and search engines.

Impact of Hand Hygiene on the Reduction of Hospital-Acquired Infections

An evidence-based research study conducted in a teaching hospital in Taiwan demonstrated that the implementation of hand hygiene programs (HHPs) reduces preventable HAIs (Chen et al., 2016). This study implemented a 4-year hospital-wide hand hygiene program in Taiwan-based hospitals with high HAI rates. This program stressed the use of alcohol-based hand rubs in Taiwan hospitals and compliance was determined by direct observation and the use of alcohol-based rub products.

A Poisson regression investigation was initiated to analyze the consistency and trends of HAIs during the research study pre-intervention period (January 1999 – March 2004) and intervention period (April 2004 – December 2007). According to Chen et al. (2016), 8,420 opportunities for hand hygiene were observed during the course of the research study. Overall, compliance levels improved from 43.3% in 2004 to 95.6% in 2007 and were fundamentally associated with increased usage of the alcohol-based hand rubs during the intervention period. Hospitals in Taiwan experienced an 8.9% reduction in HAIs and the development of MRSA and other multidrug-resistant organisms. The conclusion drawn from this research study is that hand hygiene programs decrease preventable HAIs, and challenges while increasing compliance with hand hygiene.

Other research studies completed with regards to examining and analyzing the impact of hand hygiene on decreasing HAIs have revealed that hand hygiene compliance had been linked to the decrease of HAIs (Monistrol et al., 2012). A research study conducted by Monistrol et al. (2012) to examine the impact of hand hygiene compliance with the use of alcohol-based hand rub revealed a lower incidence of new HAIs after a 12 month sustained increase in hand hygiene compliance in three internal medicine wards.

During the research study, hand hygiene practices of nurses and physicians were monitored during routine patient care using the WHO's 5 Moments for Hand Hygiene model. Alcohol-based hand rub use was monitored and recorded, and all HAI risk factors were subsequently documented and occurrence density was determined (Monistrol et al., 2012).

The study consisted of 1,693 patients, in which 1,531 opportunities for hand hygiene was observed during the 12-month duration of the research project. The study revealed that hand hygiene improved from 54.3% to 75.8% ($p = 0.005$), also alcohol-based hand rub usage increased from 10.5% to 27.2%. Overall, the research study concluded that constant hand hygiene and the uninterrupted increase in usage of alcohol-based rubs decrease the frequency of new HAIs (Monistrol et al., 2012).

A study conducted by Fox et al. (2015) examined a new hand hygiene protocol designed to decrease hospital infection rates revealed that improvement in nurses' hand washing compliance reduced infections during a 12-month period. This was a pre-experimental research study that intended to analyze and compare 12-month rates of two specific HAIs; catheter-associated urinary tract infection, central catheter-associated bloodstream infections, and nurses' hand hygiene compliance before and during the use

of this new hand hygiene protocol. Research studies on the impact of hand hygiene as an effective strategy in decreasing HAIs have proven that the prevention of HAIs requires consistent hand hygiene compliance and overall quality improvement efforts to effectively phase out these infections (Fox et al., 2015).

Hand Hygiene in Healthcare Settings

Nurses are on the front lines of providing care to patients and they are frequently in close contact with patients, patient's family members and friends. According to Kampf and Löffler (2010), nurses are contaminated at some point during their shift, either by touching contaminated surfaces, touching an infected patient, and patient care devices. Therefore, proper hand hygiene identified by the Healthcare Infection Control Practices Advisory Committee (HICPA) is the simplest and most inexpensive strategy available today that can decrease the spread of antimicrobial prophylaxis resistance and the prevalence of HAIs (Kalenić et al., 2011). Hand hygiene practices in healthcare settings are intended to preserve the life of patients while providing an intact medical care atmosphere (Kalenić et al., 2011).

Al-Kadi and Ahmad-Salati (2012) are certain that not only is hand hygiene a cost-effective measure in preventing infection transmissions, and found to be inadequate in most healthcare settings. In order to evaluate healthcare provider's understanding and compliance with hand hygiene, a study was conducted among undergraduate medical students during their clinical phase. The study used a questionnaire based on the WHO's 5 Moments for Hand Hygiene approach to examine the awareness of the implications for hand hygiene and compliance (Al-Kadi & Ahmad-Salati, 2012). The study consisted of 60 medical students, 36 males and 24 females. The study results indicated that the

average awareness concerning the positive implication of hand hygiene was 56%; the remaining 44% of the undergraduate medical students were either uncertain or unconcerned of the indications of hand hygiene. However, Al-Kadi and Ahmad-Salati (2012) indicated that on 29% of the medical students were able to successfully identify all of the WHO's 5 Moments for Hand Hygiene in the questionnaire. Overall, the study concluded that great effort is needed to enhance hand hygiene practices.

According to the CDC (2017), hand hygiene consists of either the use of soap and water or alcohol-based hand sanitizer. The CDC made clear that alcohol-based hand sanitizers are the best approach for cleaning hands when they are not noticeably soiled; however, if hand are visibly soiled soap and warm water should be used initially to remove bacterium. The ultimate goal of hand hygiene is to clean dirty hands and to decrease the number of germs on the hand in order to limit cross contamination among patients and hospital staff members (Momen, 2012). Nurses in hospitals such as the research site work 12-hour shifts, and with such long hours, it is essential that proper hand hygiene is carried out throughout their shifts in order to uphold the concept of patient care and safety while adhering to hand hygiene related policies.

In a Clean Care is Safer Care campaign, the WHO introduced the 5 Moments for Hand Hygiene. The WHO defines the 5 Moments for Hand Hygiene as the essential moments when healthcare staff members should execute hand hygiene (WHO, 2017). The approach recommended by the WHO in regards to cleaning hands in healthcare settings are:

1. before touching a patient,
2. before clean/aseptic procedures,

3. after body fluid exposure/risk,
4. after touching a patient, and
5. after touching patient surroundings.

According to Shindo and Mohite (2014), the 5 Moments for Hand Hygiene concept should be used to improve healthcare workers' understanding, surveillance on HAIs, education on the subject and reporting hand hygiene between healthcare clinical staff members.

Hand hygiene should be viewed as the responsibility of all hospital staff members (i.e., administration, environmental cleaning personnel, pharmacist) not just the nursing staff responsibility (Hart, 2013). The WHO (2013) gives support of the idea that patients and their family members can help increase hand hygiene compliance in healthcare facilities. Educating patients and their family members and encouraging them to participate in hand hygiene practices while receiving care are useful strategies that can develop a positive patient safety environment while increasing hand hygiene conformity.

Nurses' Attitudes towards Hand Hygiene

According to Sharif, Arbabisarjou, Balouchi, Ahmadidarrehsima, and Kashani (2016), nurses play a significant role in the proper fulfillment of hand hygiene among the clinical staff members and patients in their units. Due to the close relationships that nurses build with their patients, they are considered the front line clinical personnel in preventing hospital-acquired infections at healthcare facilities. In order to analyze the proper execution of hand hygiene among nurses, a cross-sectional study was conducted with a sample size of 200 of 240 nurses from three healthcare facilities in Kerman City, Iran in 2015. A standardized questionnaire was used as the data collection tool and the

frequency and rate of frequency in definitive statistics was used for data examination and determination. The confidence interval (CI) was thought out as 95%. The research study results revealed that most of the nurses that participated in the study were males, had a bachelor's degree in nursing, had 5 to 10 years working experience in nursing with good knowledge in the field and had positive attitudes towards hand hygiene. Overall, the study concluded that nurses with good attitudes towards hand hygiene performed well towards hand hygiene; however, nurse attitudes about hand hygiene can be improved by educational courses on the subject matter (Sharif et al., 2016).

A 2012 qualitative study conducted semi-structured interviews with 31 nursing students and 32 nurse mentors from a university in North England (Ward, 2012). These interviews explored the nursing students and mentors' attitudes about preventing and controlling infections, finding that nurses generally view infection prevention practices as an added workload strain as opposed to a necessary and essential element to consider in regards to quality of care and patient safety (Ward, 2012). Nursing staff member's attitudes towards hand hygiene is indeed a complicated issue, involving the idea of its influence, nursing staff personal beliefs and values and immediate barriers.

More studies on the attitudes of nursing professionals and other healthcare workers in preventing hospital related infections indicate that ill attitudes results are barriers and challenges in performing appropriate hand hygiene (Seibert, Speroni, Oh, DeVoe, & Jacobsen, 2014). Seibert et al. (2014) initiated semi-structured interviews on the attitudes of healthcare workers and how they affect the implementation of preventative measures to control microorganisms such as MRSA. MRSA reveals that most of the participants made clear that the lack of education and communication and

other barriers such as availability of sinks, time pressure makes it difficult to increase hand hygiene practices (Seibert et al., 2014).

Overall, the research consisted of a sample of 26 healthcare workers (16 registered nurses, 1 physician, 3 support staff, and 6 allied health professionals). Nurses play a key role in the proper execution of hand hygiene among healthcare professionals. A structured questionnaire consisting of 27 questions was given to 102 nurses in a hospital unit. Approximately 87% of the nurses had an understanding for aseptic techniques to include hand hygiene; 13% did not. The study shows that based on the nurses' answers to the structured questionnaire 71% displayed positive attitudes towards hand hygiene, while 29 % displayed negative attitudes towards hand hygiene due to work related stress, and minimal education on how to perform proper hand hygiene (Owolabi, 2015).

Hospital Culture and Healthcare-Acquired Infections

In 2016, the CDC announced 721,800 cases of HAIs. These infections develop and spread due to unclean hospital environments, contaminated hospital equipment and devices, and non-adherence to infection prevention strategies, such as good hand hygiene (CDC, 2016). HAIs have gained far-reaching attention from hospitals and continue to be a crucial patient care issue as well as a preventable high expense. In 2010, the CDC and Medicaid and Medicare services set a goal to decrease HAIs by 40% in 2013 in the hopes of decreasing injuries to patients by 1.8 million; this goal was not met. Because of this essential patient care issue, in October 2014, healthcare facilities with the highest percentages of preventable hospital-acquired infections were fined 1%, in addition to other federal fines.

Healthcare facilities can invest in medical staff education on infection prevention, enforce proven healthcare-acquired infection strategies such as hand hygiene and develop strategies to increase surveillance on infections. However, HAI prevention depends more on hospital culture, leadership and organizational commitment to infection prevention than on procedures and programs ("Healthcare-acquired infections," 2014). A physician found that decreasing HAIs in a hospital in the United States required changing the culture of the medical staff by conducting a qualitative study ("Changing hospital culture," 2010). According to the article, Dr. Pronovost, a professor of anesthesiology and critical care medicine at John Hopkins University School of Medicine, believes that infection prevention checklists and guidelines used in hospitals to decrease infections are not effective because they are not used consistently. The author found that physicians and nurses agree to use infection prevention checklists and guidelines provided by the hospital; however, sometimes the nurses and/or doctors forget to use them. However, if a physician forgets and a nurse is asked to speak up and point out to the physician to comply, the nurse(s) become reluctant out of fear to correct physicians. Some of the nurses' responses were "it's not my job to police the doctors, and if I do I'm going to get my head bit off" ("Changing hospital culture," 2010, p. 14). The doctors would respond, "You can't have a nurse second-guess me in public, it makes me look like I don't know something" ("Changing hospital culture," 2010, p. 14).

To overcome resistant attitudes and to enhance communication and teamwork between nurses and physicians, a program was put together that consisted of both nurses and physicians that placed great emphasis on providing education to medical providers on how to make better and well-informed decisions to safeguard patients from infections

("Changing hospital culture," 2010). The program encourages the opinion of physicians, nurses, administrators, pharmacists, social workers, and patient safety officers. Overall, this program promoted ownership, by spreading the responsibility of patient protection from infections to all professions in the hospital. With this new program, any patient safety issue that surfaced is discussed and addressed as a team.

Dr. Pronovost understood the need to change the widespread culture of arrogance in the healthcare field and, therefore, initiated a program at his healthcare institution to decrease infections by changing the culture that promotes open communication between nurses and physicians. When the program began, the infection rate for central associated infections was approximately 19-per-1,000 catheter days, which was identified as among the worst rate nationally ("Changing hospital culture," 2010). However, with the culture change of improving teamwork and communication, the hospital practically eliminated catheter-based infections to seven-per-1,000 catheter days ("Changing hospital culture," 2010).

Another study on the subject of healthcare facility culture and its relationship with hospital performance demonstrated that the relationship between nurses and physicians could determine the outcome of healthcare-associated infections (Boev & Xia, 2015). The goal of the study was to analyze the relationship between nurses and physician collaboration and hospital-acquired infections in severely ill patients. The methods used was a secondary analysis consisting of 5 years' worth of nurses' attitudes and approach data from 671 surveys from four ICUs where ventilator-associated pneumonia and central catheter-associated bloodstream infections were analyzed.

A multilevel inquiry design was used to evaluate relationships between nurses and physicians' collaboration regarding HAIs. The study results revealed that nurses and physicians' collaboration was considerably connected to infections. For every 0.5 unit increase in nurse and physician partnership, the percentage of blood stream infections decreased by 2.98 (P = .005) and pneumonia by 1.13 (P = .005) (Boev & Xia, 2015). Overall, the study concluded that nurse and physician collaboration on hospital-acquired infections could significantly impact infection rates.

Healthcare Facility Barriers

Several factors can be identified as barriers to excellent hand hygiene compliance among nurses, such as crowding and the use of nontraditional patient treatment spaces (e.g., corridors; Carter et al., 2016), high workload, limited access to hand hygiene solutions, the lack of proper hand hygiene training, and complex protocols that are difficult to carry out in overpopulated settings (Salmon & McLaws, 2015).

Erasmus et al. (2009) conducted a qualitative study which aimed to examine all potential root causes for the lack of hand hygiene compliance among healthcare staff in healthcare facilities and determined that some of the hospital staff members who participated in the study stated that poor hand hygiene adherence takes place at times because they observe and copy the behavior of their peers and leaders; observing poor hand hygiene could also serve as barriers to optimal hand hygiene practices.

Sharif et al. (2016) proposed that nurses' attitudes, personal beliefs, and culture contribute greatly to their ability to perform hand hygiene adequately in the workplace. According to Al-Tawfiq and Pittet (2013), hand hygiene is mostly linked to healthcare workers motivational levels, beliefs and overall behavior; this article discussed the

utilization of behavioral theories to promote hand hygiene in an analytical aspect. Skepticism regarding the value of hand hygiene and lack of institutional priority are some additional barriers that affect compliance to hand hygiene in healthcare facilities (Mathur, 2011).

While in nursing school, nurses receive education and training on infection control practices and safety issues (Bota, Ahmed, Jamali, & Azeem, 2013). However, false beliefs concerning hand hygiene in healthcare facilities are considered great contributors to decreased compliance. For example, some nurses believe that wearing latex gloves substitutes for hand hygiene or that constant hand hygiene practices inflict dryness of the hands and skin irritation (Spruce, 2013).

According to Spruce (2013), some other barriers to proper hand hygiene may include nurses forgetting to perform hand hygiene and not thinking about it while on their shifts, lack of motivation, and lack of safety culture or role models. Despite the increase in literature, gaps still exist in healthcare facilities on improving hand hygiene practices. Some facilities, such as the research site, have increased hand hygiene products throughout the hospital such as alcohol hand-rubs, antimicrobial soaps, clean running water, sinks, and paper towel.

Theory of Reasoned Action

The theoretical perspective that serves as the backbone of this action research project is the theory of reasoned action. This particular theory suggests that strong intentions can result in increased attempt to execute a behavior, which also increases the probability of the behavior to be performed (Banerjee et al., 2011). According to the *Encyclopedia of Public Health*, the theory of reasoned action proposes that a person, who

believes behavior (i.e., compliance) points to a positive conclusion, holds a favorable mental outlook, and therefore is much more inclined to carry out the behavior.

Seto, Ching, Yeuen, Chu, and Seto (1991) conducted a research study to investigate professional nurses' compliance with policies regarding needle recapping utilizing the theory of reasoned action. The research technique required that a percentage of professional nurses be separated into three separate groups (A, B, and C) and evaluated in order to shed light on their needle recapping practices. Consequently, nurses who were determined to put an end to recapping (agreeable) and nurses without the intent (non-agreeable) separated each group. The policy to cease needle-recapping practices was introduced to the three different groups in various ways.

The policy was submitted to Group A (the control group) by way of an electronic memo from the nursing management (an active method), Group B by pamphlets and posters (passive methods), and Group C by in-service lecture, pamphlets, and posters (passive and active methods). Changes in regards to the nurses' intention to cease needle recapping practices were much more obvious in Group B (passive methods) with an 85% increase in compliance rate which was a higher compliance rate compared to Group A at 30% increase in compliance and no compelling change in Group C.

Nevertheless, in the non-agreeable group, no major change occurred in groups A and B. However, in Group C, a change in compliance of 83% took place. This research study recommends that if new strategies and approaches are introduced to healthcare professionals, it will be best to evaluate the mental outlook and group patterns first (Creedon, 2006). Based on the information provided by this particular research, it is clear

that the method of introducing policies (e.g., passive vs. active) is essential in influencing favorable attitudes from the nursing staff.

Measures to Improve Hand Hygiene Compliance

Although there is a worldwide acknowledgment of the importance of hand hygiene practices in the reduction of hospital-acquired infections, nurses' and other clinical care workers' compliance with hand hygiene are not always optimal. A study conducted by Pan et al. (2013) to measure hand hygiene compliance and practices of nurses and other hospital care workers express that nurses and other healthcare workers have very poor hand hygiene compliance. In the study, hand hygiene compliance was monitored using the WHO's 5 Moments for Hand Hygiene model.

Hand hygiene observations were performed by 9 medical students, 11 infection control nurses, and 2 unit ambassadors in 83 hospital units. The covert observers, observed 23,333 hand hygiene observations. Low nursing and other clinical care workers hand hygiene compliance rates were discovered in 4 of the 5 moments for hand hygiene. The study recommended providing nurses and other clinical workers feedback on their hand hygiene performance and education on proper hand hygiene practices (Pan et al., 2013).

In order to improve hand hygiene compliance in healthcare facilities, it is necessary to examine all aspects that prohibit improvement such as the lack of training and education of hand hygiene practices. According to McInnes, Phillips, Middleton, and Gould (2014), hospital leadership, such as unit nurse managers, must assume responsibility for initiating patient safety initiatives. Unit nurse managers also must assume responsibility for pressuring the nursing staff members to comply with hand

hygiene and provide recommendations for improving strategies to improve hand hygiene compliance.

The placing of alcohol hand rubs is a strategy adopted by hospitals worldwide. Placing alcohol hand rubs at all in-patient and outpatient units and illustrations near sinks can all be viewed as helpful strategies in encouraging hand hygiene practices (Hübner, Hübner, & Kramer, 2013). A research study by Hansen et al. (2015) found that alcohol-based hand rubs make hand hygiene easier to perform hand hygiene due to their convenient dispenser locations. The study used alcohol-based hand rubs provision and consumption data by 232 hospitals, with a median usage of 12 mL per patient day. The study concluded that the availability of alcohol hand based rubs improved hand hygiene compliance in most units, such as ICU from 76%–100%; approximately 2/3 (65%) of non-ICU saw an increase in hand hygiene compliance. The placing of alcohol hand rubs, posters, and promotional materials, providing education, training, are all important. However, without hospital leadership's drive to enforce and hold nursing and other clinical staff members accountable for better adherence to hand hygiene practices, compliance of hand hygiene will continue to be suboptimal.

Gould, Moralejo, Drey, and Chudleigh (2010) explained through randomized control trials that hand hygiene compliance increased for one of their studies when measured by direct observation. Bolton, Rivas, Prachar, and Jones (2015) claimed that being watched could bring out the best in people. When healthcare workers know that they are being watched while caring for patients, their behavior tends to change positively. Bolton et al. (2015) conducted a randomized controlled trial to examine the effect of being watched on hand hygiene compliance in hospital staff members directly

caring for patients. Their research concluded that healthcare workers being watched while hand hygiene posters were present increased hand hygiene compliance.

A comprehensive outline of recently published evidence-based hand hygiene interventions by Neo, Sagha-Zadeh, Vielemeyer, and Franklin (2016) suggested awareness and education as key strategies to improve hand hygiene compliance in healthcare facilities. Seventy-three studies relevant to hand hygiene interventions and related points linked with healthcare settings were summarized using the Medline electronic database (PubMed). The literature review concluded that healthcare professionals must point out and analyze hand hygiene obstacles that are exclusive to an organization and develop awareness and education that are interactive and engaging to achieve and sustain successful hand hygiene compliance.

Summary

For many years, HAIs have been a challenge in healthcare organizations worldwide. However, alcohol hand rubs and the WHO's 5 Moments for Hand Hygiene guidelines are the easiest and most effective strategy to disinfect hands and reduce HAIs (Mathur, 2011). The literature review provided a rooted understanding of the issues that contribute to sub-optimal hand hygiene practices such as, the lack of education and training on the subject matter, lack of nursing motivation and leadership engagement in hand hygiene compliance. Nurses and their leadership are both ethically and professionally responsible for medical care and protection of their patients and they are expected to always practice excellent and continuous hand hygiene while on duty.

CHAPTER 3. METHODOLOGY

The purpose of the research study was to understand nurses' hand hygiene practices, their attitudes toward these practices, as well as barriers that may exist in carrying out hand hygiene compliance at the research site. There is a need for more research on nurses' hand hygiene compliance, not only because of the importance of the issue in regards to mortality, morbidity and increased cost to healthcare facilities, but also because of increased awareness that most HAIs can be averted with strategies as simple as hand hygiene (Mathur, 2011). This chapter outlines the methodology of the research, including the sample and setting selected for the study, as well as details regarding instrumentation, data collection, and analysis. The chapter concludes with a discussion of ethical considerations relevant to this study.

Research Design

According to Creswell (2013), the aim of phenomenology is to describe the shared experiences of a group of people with regard to a single phenomenon. This qualitative study was conducted using a phenomenological approach, with the central phenomenon under investigation identified as nurses' hand hygiene practices, and the group of people who have experienced the phenomenon being nursing staff from three units in Hematology/Oncology at the research site.

Sample

This particular research study is limited to nursing staff hand hygiene practices at the Hematology/Oncology research site units. Based on HAI hospital reports at the research site, the Hematology/Oncology units consistently end up with more patients with C. diff and MRSA compared to other research site units. The research site conceptualizes

workload as a nurse to patient ratio (i.e., one nurse for every four patients). The Hematology/Oncology nurses at the research site typically care for 10 to 15 patients during a 12-hour shift and there are generally 9 to 10 nurses per shift.

Participation in this study was limited to nursing staff in the hematology and oncology units at the research site, which includes 3 units: Hematology/Oncology 10 Tower unit, Bone Marrow Transplant unit, and Gynecology/Oncology 9 Tower unit. The age ranges of the nursing staff members in the first shift (7 am to 7 pm) are between 25 to 35-years old. The second shift (7 pm to 7 am) nursing staff age ranges are between 27 to 63-years old. Participants in this study were mostly Caucasians and 95% female.

The inclusion criteria for this study consisted of the following: nursing staff members at the research site who work in the Hematology/Oncology units that directly care for patients, such as: Registered Nurses (RN), Licensed Practical (LPN) and Licensed Vocational Nurses (LVN). Exclusion criteria included: Healthcare professionals that are not part of the research site's Hematology/Oncology nursing staff and healthcare professionals that do not provide direct patient care. In a Hematology/Oncology staff meeting December 20th, 2016 the nursing leadership announced that the researcher was conducting a research study on the association of hand hygiene and HAIs in the Hematology/Oncology units.

The researcher was introduced and provided a brief overview of the study and its purpose and explained that the goal is to do some direct observations and one-on-one interviews. It was communicated to the nursing staff that the study is voluntary and that responses will be kept confidential; they were informed on how to participate in the study

if they are interested. Nursing leadership was present at the recruitment sessions because the research study was announced at staff meetings.

Recruitment methods used to solicit research participants consisted of posting flyers in physical spaces (i.e., Hematology/Oncology break rooms and locker rooms), in-person recruitment at the research site's three Hematology/Oncology units and a recruitment scripts that explained the study to the nursing staff at the Hematology/Oncology staff meetings. The recruitment script emphasized that participation in the research is voluntary and that their choice to participate or not has no bearing on their employment status. No incentives were used for Hematology/Oncology nursing staff member's participation in this research study. Purposive sampling was used to interview four nurses from each of the three Hematology/Oncology units, for a total of 12 interviews. Close to the 12th interview, no new information was received and it was concluded that data saturation was reached.

Setting

This research study was carried out at the research site, which is a teaching hospital in a Southeastern state. The research site is accredited and recognized as a leading cancer research and treatment facility, delivering services ranging from behavioral health, cancer treatment, surgery, and so on. The research site has a comprehensive Hematology/Oncology program that involves several experienced physicians, nurses, and research workers. This research study did not involve physicians; it only involved male and female nursing staff members in the first and second shifts.

Instrumentation/Measures

The interview guide was designed by the researcher and included 10 open-ended questions and the interviews lasted between 45–60 minutes (see Appendix C). Data collection instruments for this research project included a semi-structured interview guide and an observation tool. Research observations were based on a hand hygiene observation tool developed by the researcher to assess the number of times nursing staff members performed hand hygiene over the total number of missed moments of hand hygiene observed (see Appendix D). Hand hygiene consisted of the use of alcohol-based hand rubs, to include traditional hand washing with soap and warm water. The research observation assessed the number of times nursing staff members performed hand hygiene over the total number of missed moments using the WHO's 5 Moments for Hand Hygiene hand hygiene observed when it was applicable. Instances when hand hygiene was recorded include: before touching a patient, before clean/aseptic procedures, after body fluid exposure, after touching a patient, and after touching patient surroundings.

Data Collection

Data were collected through semi-structured interviews with nursing staff and direct observations recorded by the researcher while observing nursing staff on duty. Interviews took place in the second floor operating room conference room at the research site. Consent forms were provided to the research participants in person just prior to conducting the interviews. All research participants signed the consent forms prior to participating in the interview**.** Interviews were audio-recorded and transcribed verbatim for data analysis.

Direct observations were recorded through an observation tool and hand-written field notes. Hand hygiene observations took place in the three Hematology/Oncology units at the research site while nursing staff members were on duty caring for patients; the observation was limited to the nurses' hand hygiene practices. Observations lasted between 15 and 25 minutes. Overall, a total of 72 nurse hand hygiene practices were observed during this study

Data Analysis

Audio recordings of interview data were transcribed verbatim by the researcher using the NVivo 11 computer assisted qualitative analysis software. Handwritten field notes from the observations were scanned and uploaded as PDF documents into NVivo where they helped inform the coding and analysis process. Interview and observational data were reviewed in the NVivo software and were processed and organized into codes, and ultimately into major emergent themes that assisted in answering the research questions of the study. Since coding and analysis of qualitative data are processes that are intertwined, the analysis occurred during the coding stage, as well as after all coding was complete.

Ethical Considerations

The main ethical considerations relevant to this research study were making sure that the study's participants were assured of the confidentiality of their responses. A second ethical consideration was that the participants were not be put in a position where they are concerned for their jobs because of something the researcher might have observed or asked them about regarding their jobs and hand hygiene practices. Great care was taken in making sure to not reveal any kind of details about the participants in

the results that might make it possible for someone to personally identify them or tie their responses to them in any way.

CHAPTER 4. RESULTS

Research Methodology Applied to Data Collection and Analysis

To keep the study focused on answering the research questions, the researcher reviewed the research questions and the study's purpose often and kept them in a visible place throughout the coding and analysis process. No notes were written down during the research interview session and no analytical memos/notes were written down as the data was transcribed. The researcher transcribed all of the recorded interview audio files in order to be immersed in the data. Before coding and analyzing the transcribed data, the researcher read through and reviewed all of the transcripts.

All interviews were transcribed verbatim using the computer-assisted qualitative data analysis software NVivo 11. The data was also coded and analyzed once it was transcribed in NVivo 11 as well. The steps in transcribing the 12 interviews consisted of:

- Transcribing each interview as its own file, so that each interview was separate from the others.
- Clearly identifying the speaker in each sentence. The researcher made certain that each research participant's actual names were not included in the transcriptions. Each of the study participants was referred to by a pseudonym in order to protect the participants' confidentiality.
- Verbal pauses such as "um," "uh," "ah," were excluded while transcribing each interview.

Once the transcriptions were completed, the researcher uploaded them into NVivo 11 for coding. The researcher applied first-cycle coding to all transcriptions in the form of descriptive codes, and the researcher reviewed the codes and collapsed codes that were

redundant (e.g., the codes "Barriers to hand hygiene," and "Hand hygiene opportunities," were collapsed into one code) and made sure that code labels and coded attributes were consistent (e.g., the codes "Hand hygiene activities" and "Hand hygiene practices"). Once first-cycle codes were finalized, second-cycle coding was applied by organizing codes into categories where the researcher perceived that the codes could be grouped together based on thematic similarity. For example, a category for Evaluation was developed because it appeared that the codes of "Monitoring," "None" (meaning no evaluation), and "Team Meeting," fit together well under a broader category of Evaluation, and similarly for the other categories.

After all of the codes were organized into categories, the researcher reread through the list of categories and removed redundancies and identified if there were any categories in the list that would be better suited as subcategories of another category. The researcher then moved from categories to major themes, read and reread through data, codes, and categories, and thought about how different categories may fit together into broader, major themes (e.g., the categories of Training and Guidelines fit together into a broader theme of Barriers to Hand Hygiene). The ultimate goal was to be able to answer the research questions with these themes.

Analysis, Synthesis, and Findings

This section provides a presentation of the thematic analysis utilized to answer the study's research questions, which were:

RQ_1: What are hand hygiene practices of nurses at the research site?

RQ_2: How are hand hygiene practices for nurses being encouraged and/or enforced by clinical leaders?

RQ_3: What are barriers for nurses in carrying out hand hygiene practices?

RQ_4: How are the attitudes of nurses impacting hand hygiene practices?

The following four themes emerged from the data analysis: Hand Hygiene Practices, Hand Hygiene Encouragement/Enforcement, Barriers to Hand Hygiene, and Nurses' Attitudes Towards Hand Hygiene. Table 2 below is a presentation of the emergent themes and categories that resulted from the analysis.

Table 2

Major Themes, Categories, Codes, and Sources

Themes	Categories	Codes	Sources
Hand Hygiene Practices	Hand Hygiene Tools	Foam Sanitizer	11
		Antimicrobial Soap	10
		Gloves	7
		Poster	4
	Hand Hygiene Activities	Everything	7
		Medical Equipment	3
		Bodily Fluids	1
Hand Hygiene Encouragement/Enforcement	Guidelines	None	6
		Education	5
		H-Drive	3
	Evaluation	Monitoring	8
		Not Monitoring	4
	Training	None	6
		In-Service	4
		Importance of Hand Hygiene	3
Barriers to Hand Hygiene	5 Moments for Hand Hygiene	Busy	4
		No Challenges	10
	Training	None	6
		In-Service	4
		Importance of Hand Hygiene	3
	Guidelines	None	6
		Education	5
		H-Drive	3
Nurses' Attitudes Towards Hand Hygiene	Nurse Role	Major	7
		Safety	6
	Hand Hygiene Practices	Before & After Entering Patient Room	2
		Before & After Touching Patients	4
		For Patients	4
		Protect Self	3

Themes

Theme 1: Hand Hygiene Practices

When questioned about their personal hand hygiene practices, respondents tended to discuss specific tools they use (such as antimicrobial soap or foam sanitizers), and activities in which they practice hand hygiene. This Hand Hygiene Practices theme has two categories grouped under it, Hand Hygiene Tools and Hand Hygiene Activities.

Hand hygiene tools. When discussing their hand hygiene practices, respondents reported using a variety of hand hygiene tools, including the use of alcohol-based foam hand sanitizers, antimicrobial soap, hand hygiene posters and the use of gloves with guidance from the WHO's 5 Moments for Hand Hygiene. The hand hygiene tool that was reported most frequently was the foam sanitizers. One nurse stated, "Most of the nurses prefer to use the foam sanitizers because it is quick to use and it dries fast without the use of hand towels," and another nurse stated, "I use the foam stuff because it is much more convenient than the Dial soap." Based on the feedback received from the participants, it appears that the majority of the nurses use the foam hand sanitizers because of convenience, both because of the easily accessible placement of foam sanitizer stations outside of patients rooms, and because they do not need to wash and dry their hands after using it.

Hand hygiene activities. With regard to the type of activities associated with performing hand hygiene, one respondent reported practicing hand hygiene only after being exposed to their patients' bodily fluids "draining wound or whenever blood is visible" or "when their hand are visibly soiled" and three respondents stated that they are more likely to engage in hand hygiene activities after inserting devices such as, central

lines, IV's, after a dressing change, and when inserting Foley Catheters. The rest of the interviewees stated that they engage in hand hygiene activities after touching any and everything in the hospital; anything that involves patient care. One of the respondents stated that it is important to engage in hand hygiene activities after touching "everything, from the patients to patient equipment's to staff hardware." Based on the feedback provided by the respondents, it appears that hand hygiene activities are engaged by some after touching anything that is used on patients or clinical staff members, after touching patients to protect self, before entering a patient's room to protect the patient from hospital microorganisms and when leaving a patient's room to prevent the spread of infections.

Based on the direct observations recorded on 72 individual nurses' hand hygiene practices in the three research site's Hematology/Oncology units, all of the nurses (100%) was observed using foam hand sanitizers while caring for their patients. The researcher observed nurses using the foam hand sanitizers before entering and when exiting patient rooms. However, discrepancies were observed in regards to performing hand hygiene after changing gloves with four nurses while caring for multiple patients; they were considered missed opportunities for hand hygiene on the hand hygiene observation tool.

Theme 2: Hand Hygiene Encouragement/Enforcement

When asked about how hand hygiene is encouraged and enforced in their units, respondents referred to specific guidelines, evaluations, and trainings (i.e., in-service, educational documents on the research site's computer H-drive, and hand hygiene monitoring with the use of secret shoppers, volunteers, infection preventionist, and nursing peers) that helped encouraged and enforced hand hygiene practices in their units.

This Hand Hygiene Encouragement/Enforcement theme has three categories: Guidelines, Evaluation, and Training.

Guidelines. In regards to infection prevention guidelines provided to the 12 research participants by their leadership, five stated that they were provided with guidance on infection prevention. The guidance received by leadership was in regards to the WHO's 5 Moments for Hand Hygiene and Infection Prevention in-service; some of the respondents also stated that guidelines on Infection Prevention are located in the research site's H-drive. One respondent stated that "Leadership has also provided us with the policies and guidelines pertaining to infection prevention. All of the educational stuff are on our H-drive and we all have access to it." Another respondent noted, "In this unit we have had a couple of in-services done by the infection control folks, teaching us on the importance of hand hygiene and strategies and measures that can be taken to prevent the spread of infections." Overall, the rest of the research participants stated they have not received any guidelines on infection prevention from their leadership.

Evaluation. Based on the responses received by the research participants, 8 out of 12 believe that their leadership has taken specific measures to evaluate hand hygiene in the units in the form of surreptitious monitoring, and periodic monitoring by managers. Some of the respondents' comments regarding hand hygiene evaluation in units are: "our assistant manager monitors our hand hygiene from time to time," "we have secret shoppers. The nurse manager did tell me that they were using the hospital's volunteers to walk around the unit to monitor our hand hygiene," and "patient safety officers usually round in our unit and monitor nursing hand hygiene." A key observation made in regards to unit leadership evaluation of hand hygiene practices is that all of the day shift

confirmed that their leadership evaluates and monitor their hand hygiene practices. Four of the respondents stated that they do not know what their leadership is doing to evaluate hand hygiene with statements such as: “I cannot answer that question because I truly do not know.”

Training. In regards to training received on HAI prevention, six of the respondents made clear that they did not receive any training. Some of the statements made regarding training on hospital-acquired infection prevention in the units were: “I haven’t received any training,” “I haven’t received any [research site] training on infection prevention, except what was taught to me at nursing school,” “What training? The last training I got on infection control was in nursing school back in 1996,” “In the three years I have been here, I haven’t received any training.” Most of the night shift nurses affirmed that they haven’t received HAI prevention training since working in the Hematology/Oncology unit(s).

Overall, hand hygiene practices appear to be enforced more than they are encouraged in all three of the Hematology/Oncology units. Nurse Managers and assistant nurse managers enforce hand hygiene practices by appointing secret shoppers in the units that sometimes consists of appointed nursing staff members, research site volunteers, and infection preventionists from the infection control department. During the interviews, there were frequent mentions of posters of the WHO’s 5 Moments for Hand Hygiene strategically places at the nursing stations, over unit sinks and bathrooms and breakrooms to remind the nursing staff to wash their hands. Four of the interviewees mentioned having received at least one infection prevention related in-service since serving on their unit; no additional training received by Hematology/Oncology nursing staff. However,

three of the interviewees acknowledged that training on hand hygiene practices can help improve their hand hygiene practices.

Theme 3: Barriers to Hand Hygiene

When asked about the barriers to hand hygiene in their units, the respondents tended to bring up challenges such as difficulties complying with all or some of the 5 Moments for Hand Hygiene when units are busy and they care for more patients than usual. The Barriers to Hand Hygiene theme has three categories: the 5 Movements for Hand Hygiene, Training, and Guidelines.

The 5 moments for hand hygiene. The 5 Moments for Hand Hygiene was stated by four individual research participants as a challenge because when the unit is busy with more patients to care for, it can be difficult to keep track of the 5 Moments for Hand Hygiene. With regard to barriers in complying with the 5 Moments for Hand Hygiene, one respondent commented on a heavy workload interfering with remembering the 5 Moments, "It gets busy at times making it somewhat hard to remember to do all of the five moments hand hygiene." Another participant commented similarly, but emphasized a sense of needing to work quickly being a barrier, "Sometimes the pressure put on us to hurry up and treat these patients causes me to get sidetrack. Sometimes I can't remember if I washed my hands or not since I'm always rushing." Another respondent focused on multi-tasking being a barrier:

> Multi-tasking can pose a barrier. Most of the time we have 3 to 4 patients to monitor and care for and I know personally for me if I'm not paying close attention, I may skip one of the steps. I'm not saying that I have, but I'm saying it's a possibility.

The researcher observed four missed opportunities for hand hygiene while four nurses were caring for multiple patients during a busy shift in the day. The nurses did not perform hand hygiene after changing gloves to care for other patients. The researchers missed hand hygiene observation during the busy shift aligns with what the interviewees stated regarding the difficulty of keeping track and remembering all the 5 Moments for Hand Hygiene while attending to heavy workloads.

The rest of the research participants claimed that they have not faced any challenges carrying out hand hygiene practices in their unit. Some even stated, "I wouldn't say I face any challenges. I perform hand hygiene all the time and with the foam dispensers that they have throughout the unit it certainly makes it easier to clean your hands," "The hand sanitizing containers are right outside the patient's rooms, so it's easy to perform hand hygiene. I haven't faced any challenges," and "We have everything we need to perform hand hygiene here in BMTU. Besides, the 5 moments are pretty much self-explanatory."

Training. Half of the respondents (six) stated that they did not receive any hand hygiene training at the research site. Specifically, none of the 12 respondents stated that they received hand hygiene training on the WHO's 5 Moments for Hand Hygiene. Familiarization with the WHO's 5 Moments for Hand Hygiene based on some of the respondent's comments are from posters on the units. Some of the statements made by the respondents in regards to familiarizing themselves on the 5 Moments for Hand Hygiene are: "We also have a poster of the moments when hand hygiene should be performed placed right over each of our sinks and bathrooms in the unit," "Our

leadership post a lot of the 5 moments for hand hygiene posters in the unit. We have a couple in the break room and the nurse station."

In regards to overall training on hand hygiene, some of the statements made by respondents in regards to training are: "I haven't received any training. It would be nice if we could get online training on infection control practices in oncology units. The training being online will be much more convenient," and "I can't say for sure that I have received training in infection control based on [the research site's] standards. I just apply my nursing training and apply the same technique I had while I worked for [the research site] here in regards to hand hygiene."

Training is an important aspect of preventing hospital-acquired infections and one of the respondents that claimed to have received training on hand hygiene expressed that by stating:

> Well, the training that we have received was on the importance of hand hygiene. There are several things that can happen if we don't wash our hands appropriately when providing care to patients. For instance, we can easily pass down viral infections or bacterial infections, so we have been educated on the importance of hand hygiene and preventing hospital-acquired infections.

Guidelines. Six of the 12 respondents claimed that they haven't received any guidelines for hand hygiene by their leadership. However, a total of five respondents stated that they did receive guidelines on hand hygiene practices based on the WHO's 5 Moments for Hand Hygiene in their unit(s). One respondent stated, "They have provided us with education and guidelines, specifically of the five moments for hand hygiene". Another respondent stated, "We have received in-service and the 5 movements for hand

hygiene posters by our director of nursing, but besides that, I haven't received any other guideline."

Theme 4: Nurses' Attitudes Towards Hand Hygiene

When asked about their attitudes towards hand hygiene, respondents tended to refer to their role as "major" in carrying out optimal hand hygiene practices. The nurses believe performing hand hygiene before and after entering a patient's room and before and after touching patients can protect self and the patients from hospital-acquired infections. The Nurses' Attitude towards Hand Hygiene theme has two categories: Nurse Role and Hand Hygiene Practices.

Nurse role. Based on the interviewee responses, nurses understand that they play a major role in safeguarding their patients from acquiring infections from clinical staff members, hospital environment, and other patients. Some of the nurses stated that:

> As a nurse, we play a major role in controlling infections. We are the ones who the patients see as we provide care to them throughout the day and it is very important to wash our hands in-between procedures or patients to prevent the spread of any types of infections. So we play a major role in keeping our patients safe.

Another nurse stated:

> Our role is to protect our patient using a simple technique. We can control the spread of infections by just washing our hands. We spend so much time with these patients and we are more likely to cause them harm with infections if we don't mind our hand hygiene practices.

The nurse continued by stating, “Since we spend the most time with the patients I would say we play a major role in controlling infections. If we don’t wash our hand, our patient’s get sicker.” The nurses understand that their lack of hand hygiene practices can gravely affect their patients and co-workers and with this thought in mind they frequently use the alcohol foam hand rubs placed outside and inside of patient’s rooms to conveniently perform hand hygiene. The nurses believe that lack of hand hygiene practices contributes to HAIs and that every time they perform hand hygiene they decrease their patients risk of HAI during their admission.

Hand hygiene practices. Nurses’ daily duty and function in their respective units require them to provide quality care to patients. Proper hand hygiene practices are a major part of providing quality care to patients and with the foam hand sanitizers strategically placed throughout the hospital units, it is very convenient for nurses to perform hand hygiene. Two respondents stated that they perform hand hygiene with the use of the foam hand sanitizers in the units before and after entering patient’s rooms.

The interviewees stated, “Personally, I like to use the foam hand sanitizers because it does not require me to dry wet hands. Coming in and out of the patient’s rooms, I use the foam and I also use it before I put on gloves,” and “Before proving care to a patient, I would use the foam sanitizers and scrub my hands for 30 seconds before and after I leave a patient’s room.” Four respondents stated that they specifically perform hand hygiene before and after touching their patients (i.e., “On my unit we are trained to wash our hands before caring for our patients. It is very important to use antimicrobial soap or foam sanitizers before and after touching a patient”). Some stated that they do it to protect themselves (“Our role is to also protect ourselves from these infections as

well") and others say they do it to protect themselves, other staff members and the patients from infections ("We can absolutely protect our clinical team and our patients by simply washing our hands").

Summary

The purpose of this qualitative phenomenological research study was to understand nurses' hand hygiene practices, their attitudes toward these practices, as well as barriers that may exist in carrying out hand hygiene compliance at the research site's Hematology/Oncology units. This research study also aims to provide the research site's Hematology/Oncology nursing staff, nursing staff leadership, and infection prevention leadership with a summary of the study's results. Overall, a total of 12 nurses were interviewed for this study and this chapter presented the results of the data analysis in answering the study's research questions. The analysis resulted in the following four themes: Hand Hygiene Practices, Hand Hygiene Encouragement/Enforcement, Barriers to Hand Hygiene and Nurses' attitudes towards Hand Hygiene. Based upon the interview conducted the nurses assert good hand hygiene practices using, predominately, foam sanitizers (only one mentioned the use of soap and water with reference to a specific type of infection) but without on-going education, specific training or formal evaluation. The lack of specificity of practice with reference to patient care activities feels rather casual. The totality of response, while without elaboration seems that hand hygiene is basic, made convenient with foam hand sanitizers and pretty routine.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

Introduction

Chapter 5 includes a discussion of the results of this phenomenological study in order to provide an evaluation of the results of nurses' hand hygiene attitudes, practices, and barriers, as well as to discuss how the results informed the study's research questions. Chapter 5 includes a review of the research problem and purpose, a discussion of the study's significance, as well as the analysis, synthesis, evaluation and implications of the study's findings, conclusions and recommendations, a discussion of the conclusions in relation to the literature in the field, limitations of the study, and a summary.

Review of the Research Problem and Purpose

Due to mortality, morbidity and increased healthcare cost following incidence of hospital-acquired infections, there is a great urgency for more analysis and examination of nurses' hand hygiene practices and conformity. Evidence from the literature suggests that constant practice of hand hygiene while caring for patients decreases the risk of infections (Mathur, 2011). Based on the HAI rates reported to the CDC/NHSN by the research site from October 2015 to March 2016, it is clear that the hospital possibly can improve their hand hygiene practices and approach for conversation regarding possible inconsistencies in hand hygiene. The purpose of this research study was to understand the research site's nurses' hand hygiene practices, their attitudes towards these practices, as well as barriers that may prevent successful hand hygiene conformity at the research site's Hematology/Oncology units. This qualitative phenomenological research study also directs the research site's Hematology/Oncology nursing staff, nursing staff leadership,

and infection prevention leadership with a comprehensive summary of the study's conclusions.

Significance

HAIs take a toll on patients, their loved ones, hospital staff members and society, physically, mentally, and financially (Reinhard et al., 2008). Multiple studies have found that good hand hygiene practices, positive attitudes about hand hygiene, and/or addressing hand hygiene barriers positively impact the rate of HAIs. For example, according to Tippin (2015), good hand hygiene is one of the easiest and most important actions that healthcare professionals can carry out to decrease the overall spread of infectious diseases and safeguard the health of patients. Mathur (2011) also supports this notion by stating that hand hygiene is the most simple and most cost effective strategy that can decrease HAIs. Overall, the results of this research study contribute to the body of knowledge on hand hygiene, as well as specifically to the research site's Hematology/Oncology nursing units.

Analysis, Synthesis, and Evaluation

The major themes that emerged from the data analysis were: Hand Hygiene Practices, Hand Hygiene Encouragement/Enforcement, Barriers to Hand Hygiene, and Nurses' Attitudes Towards Hand Hygiene, with a focus on answering the research questions that guided the study; each theme is discussed and evaluated in detail.

The research questions that steered this study were:

RQ_1: What are hand hygiene practices of nurses at the research site?

RQ_2: How are hand hygiene practices for nurses being encouraged and/or enforced by clinical leaders?

RQ_3: What are barriers for nurses in carrying out hand hygiene practices?

RQ_4: How are the attitudes of nurses impacting hand hygiene practices?

Interview and observational data were reviewed, processed, and organized into codes, and into conclusively leading emergent themes that helped in answering the research study questions. The following themes and categories were developed from the data analysis:

Theme 1: Hand Hygiene Practices

Participant responses regarding hand hygiene practices fell under two categories: Hand Hygiene Tools and Hand Hygiene Activities. Regarding Hand Hygiene Tools, it is clear that participants primarily use foam sanitizers, antimicrobial soap, and gloves as hand hygiene tools. Most of the participants use and appreciate the foam hand sanitizers because they are placed in the units and the use of these hand sanitizers does not require the use of water and towel. This aligns with what the researcher observed while observing Hematology/Oncology nurses hand hygiene practices in both day and night shifts. In regards to hand hygiene activities, or specific actions that require hand hygiene, the nurses' responses varied. Some of the responses were that hand hygiene is performed after exposure to patients' bodily fluids, when hands are visibly soiled, after inserting devices in patients, and/or after touching anything that is in the hospital and that involves patient care.

These responses align with the 5 Moments for Hand Hygiene guideline moment 3 (After bodily fluid exposure risk) and moment 5 (After touching patient's surroundings). Based on the researcher's observation while observing nurses' hand hygiene activities, hand hygiene practices were performed more when nurses enter and exit patient rooms,

compared to when they perform activities in the patients' rooms (i.e., insert a central line). Missed opportunities were observed for hand hygiene after the removal of gloves for four nurses on the day shift; this missed opportunity may be the result of a busy unit and increased workloads. According to the WHO's 5 Moments for Hand Hygiene guideline, hand hygiene must be carried out in all implications regardless of whether healthcare workers used gloves. The use of gloves during patient care does not make up for the need for cleaning hands (WHO, 2017).

Theme 2: Hand Hygiene Encouragement/Enforcement

Participant responses regarding hand hygiene encouragement/enforcement fell under three categories: Guidelines, Evaluation, and Training. When the research participants were asked about the encouragement and enforcement of hand hygiene practices at their respective research site Hematology/Oncology units, it was discovered that nursing leadership uses secret shoppers to monitor, evaluate and report the hand hygiene practices of the nursing staff members. There were also mentions of in-service and educational written communications stored on the research site's computer H-drive available to educate, provide guidance and to train and encourage optimal hand hygiene practices. Some of the respondents asserted that they have not received any guidelines or training from their leadership on appropriate hand hygiene practices and HAI prevention strategies.

The majority of the day shift affirmed that their leadership evaluates and supervises their hand hygiene practices and most of the night shift asserted that they have not received any training on HAI prevention since working in the research site's Hematology/Oncology unit(s), which ranges from 6 months to 10 years. In general, it

does not appear that hand hygiene is encouraged as much in the Hematology/Oncology units as it is enforced. Hand hygiene appears to be adequately enforced with in-services, secret shoppers, and guidelines on infection. However, without adequate support towards improving hand hygiene practices, such as training and leadership guidance on how to prevent and control HAIs there may continue to be barriers and opportunities that impede stellar hand hygiene practices and overall patient care.

Theme 3: Barriers to Hand Hygiene

Participant responses regarding barriers to hand hygiene fell under two categories: 5 Moments for Hand Hygiene, Training and Guidelines. When queried about possible barriers that may prevent nurses from performing frequent and appropriate hand hygiene while caring for patients, the respondents brought up specific issues with adhering to the 5 Moments for Hand Hygiene when the units are busy with more patients than usual and when they feel pressured and rushed to care for multiple patients. Based on the interviewees' responses, caring for more than the usual number of patients, feeling pressured and rushed, may result in breaks in hand hygiene practices and infection prevention strategies. Such issues cause nurses to lose track of which moment of the WHO's 5 Moments for Hand Hygiene was missed, or forget if they washed their hands or not. Missed hand hygiene opportunities were observed when the researcher observed nurses' hand hygiene during the day shift. The unit did appear very busy when the researcher observed four individual nurses' missed opportunities to perform hand hygiene after changing gloves and moving along to care for other patients.

This is where frequent and effective training on hand hygiene practices is important. Half of the respondents made clear that they did not receive any hand hygiene

training at the research site; specifically, none received hand hygiene training on the WHO's 5 Moments for Hand Hygiene. Frequent and interactive training on the 5 Moments for Hand Hygiene may help familiarize the nurses with the different points of hand hygiene and help them to remember. Clear direction and expectation from nursing leadership on hand hygiene practices based on the 5 Moments for Hand Hygiene may even incline and lead nurses to increase their hand hygiene compliance. The busyness and pressure put on nurses to hurry when caring for patients should be addressed by way of discussion with nursing leadership regarding the possibilities to lighten heavy patient loads in the research site's Hematology/Oncology units.

Theme 4: Nurses' Attitudes towards Hand Hygiene

Participant responses regarding nurses' attitude towards hand hygiene fell under two categories: Nurse Role and Hand Hygiene Practices. When questioned about their attitudes towards hand hygiene, the nurses indicated that they understand clearly that their mental outlook in relation to hand hygiene is essential in protecting patients, and the nursing staff members from acquiring infections. Based on the participants' responses, the nurses believe that their role in preventing HAIs is significant; they believe that their actions while caring for patients determines their patient's experience during their hospital admission.

The interviewees are aware of the rationale for hand hygiene practices. The interviewees believe that HAIs can be reduced and/or be prevented by performing consistent hand hygiene prior to patient contact, after contact with patients, after touching environmental surfaces, and before and after the use of gloves. The nurses' understanding of the importance of hand hygiene in the prevention of HAIs connects with the theory of

reasoned action, which points out that strong aim and purpose towards something can develop heightened effort to carry out a practice.

The theory of reasoned action helps to explore nurses' infection prevention principles from a behavioral point of view in this research study. This theory is involved mainly with an individual's attitude and their overall intentions (Creedon, 2006). With the theory of reasoned action in mind, nurses who believe their practice and attitude towards good and frequent hand hygiene lead to positive results, such as decreased HAIs at the research site's Hematology/Oncology units are likely to gain a positive attitude about hand hygiene, and therefore are likely to perform good and frequent hand hygiene.

Based on the researcher's observation, all of the 12 nurses interviewed for this qualitative research study on the association of hand hygiene, HAIs at the research site displayed favorable attitudes towards hand hygiene, and the use of alcohol-based had rubs in the units to decrease infections. The nurses' positive attitudes likely increase their intention to carryout good hand hygiene practices. Hand hygiene is an effective strategy for prevention HAIs and in units such as Hematology/Oncology where there are life ending risks to cancer patients burdened with compromised immune systems, nurses' hand hygiene compliance is vital.

Appropriate hand hygiene not only prevents these particular patients from getting sicker, but it also decreases the risk of infecting other immunocompromised patients. At the research site, the nurses perform hand hygiene with foam hand sanitizers that are conveniently placed throughout the units. These foam hand sanitizers are used when entering and exiting patient rooms to protect themselves, the patients and colleagues. Based on the researcher's observation in the research site's three Hematology/Oncology

units, the nurses were confirmed using the foam hand sanitizer frequently, especially when entering and exiting patient rooms.

Implications of Findings

Research Questions

RQ_1: What are hand hygiene practices of nurses at the research site?

Based on the respondents' responses from the interviews, nurses' hand hygiene practices at the research site include the use of alcohol-based foam hand sanitizers, antimicrobial soap, and the use of gloves with the guidance of the WHO's 5 Moments for Hand Hygiene. The researcher observed nurses using mainly the foam hand sanitizers before entering and when exiting patient rooms and using soap and warm water for visibly soiled hands. There were comments from the respondents regarding how convenient the foam sanitizers were due to the placement right outside of patient rooms and not having to wash hands. Respondents also reported practicing hand hygiene after touching anything that's used on patients or clinical staff members. Performing hand hygiene before and after touching patients to protect self, before entering a patient's room to protect the patient from hospital-acquired infections and when leaving a patient's room to prevent the spread of infections was frequently mentioned by the respondents.

RQ_2: How are hand hygiene practices for nurses being encouraged and/or enforced by clinical leaders?

When discussing how hand hygiene practices for nurses are encouraged and/or enforced by clinical leaders, respondents expressed that, nursing leadership enforces hand hygiene practices by appointing secret shoppers in the units. The secret shoppers sometimes consist of appointed nursing staff members, the research site's volunteers and

infection preventionists from the infection control department. Some of the respondents reported having at least one HAI prevention training at the research site; however, six respondents stated that they did not receive any training on hand hygiene since working at the research site. Posters of the WHO's 5 Moments for Hand Hygiene are placed at nursing stations, unit breakrooms, and bathrooms in Hematology/Oncology units.

RQ_3: What are barriers for nurses in carrying out hand hygiene practices?

High patient volumes and rushing to care for multiple patients at a time during a shift serves as a barrier for nurses to keep track of and perform all the 5 Moments for Hand Hygiene. Also, the lack of formal training on HAI prevention could potentially be a barrier in carrying out effective hand hygiene in the research site's Hematology/Oncology units. With half of the research study participants claiming that they have not received training on hand hygiene practices at the research site, it can be expected that this may limit high hand hygiene compliance rates. In-services done at some of the units are great starts; however more frequent training is needed to keep the nursing team up-to-date on hand hygiene practices and strategies.

RQ_4: How are the attitudes of nurses impacting hand hygiene practices?

The nurses' reported positive attitudes towards hand hygiene. They indicated that they recognize that they play a significant role in protecting themselves, their patients, and clinical staff from HAIs. The nurses understand that they spend a lot of time with their patients and that they are much more likely to be the source of spreading infections if they fail to practice proper and frequent hand hygiene. Overall, they believe that poor hand hygiene practices contribute to increased HAIs and that good hand hygiene is one

specific strategy that they can carry out to decrease patients' risks of infections during an admission and to protect themselves and their family from infections.

Conclusion 1

More direct training on hand hygiene and HAIs are needed based on what some of the respondents said during the research interviews. A total of six respondents stated that they did not receive any training on hand hygiene since working at the research site. The statements made regarding the lack of training on hand hygiene and HAI prevention were: "I haven't received any training", "I haven't received any [research site] training on infection prevention, except what was taught to me at nursing school", "What training? The last training I got on infection control was in nursing school back in 1996", "In the three years I have been here, I haven't received any training". Most of the night shift nurses affirmed that they haven't received HAI prevention and hand hygiene training since working in the Hematology/Oncology unit(s), whereas six nurses in the day shift stated that they received at least one in-service training on HAI prevention and/or training on the importance of hand hygiene during their employment in the respective units.

Recommendation 1

Hand hygiene is regarded as an essential factor in hospital-acquired infection prevention and control. A recommendation to offer periodic training on hand hygiene and hospital-acquired infection prevention is essential to all the research site's Hematology/Oncology nursing staff. Effective training on hand hygiene can help guide nurses to achieve higher levels of hand hygiene compliance and it may also help prevent the spread of HAIs between patients and hospital staff.

Conclusion 2

Patient-load, busyness, or feeling rushed can cause nursing staff members to not be as thorough about hand hygiene. Four respondents stated that the WHO's 5 Moments for Hand Hygiene can sometimes pose a challenge when caring for patients at times when the units are busy with more patients to care for. In regards to the difficulty in complying with the WHO's 5 Moments for Hand Hygiene, one respondent stated, "Sometimes the pressure put on us to hurry up and treat these patients causes me to get sidetrack. Sometimes I can't remember if I washed my hands or not since I'm always rushing" Similarly, another respondent stated:

> Multi-tasking can pose a barrier. Most of the time we have 3 to 4 patients to monitor and care for and I know personally for me if I'm not paying close attention, I may skip one of the steps. I'm not saying that I have, but I'm saying it's a possibility.

Recommendation 2

A possible recommendation for addressing this issue of busyness or feeling rushed would be to either hire more experienced nurses to decrease the number of patients each individual nurse has to tend to or schedule fewer patients if possible to prevent missed steps in infection prevention strategies, such as the 5 Moments for Hand Hygiene. Another possible recommendation would be to recommend that the research site's Hematology/Oncology unit's culture be evaluated in terms of nurses feeling rushed to care for their patients. Perhaps nursing leadership could shift some responsibilities elsewhere and lessen the feeling of being rushed and busy.

Recommendations for Future Research

Based on the findings of this research study, additional research on gaining the perspectives of nurse managers regarding nurse hand hygiene could potentially contribute to an understanding of nurse hand hygiene practices, since they are monitoring them to some degree. Such research would be helpful in furthering what has already been done in this qualitative research study to raise awareness on hand hygiene practices at the research site.

Discussion of the Conclusions in Relation to the Literature in the Field

An evidence-based research study conducted in a teaching hospital with high HAI rates implemented a 4-year hospital-wide hand hygiene program that stressed the use of alcohol-based hand rub products with increased hand hygiene compliance levels. The study concluded that hand hygiene programs downturn avoidable HAIs (Chen et al., 2016). Other research studied in the literature reveal that hand hygiene protocols decrease hospital-acquired infection rates and improve nurses' hand hygiene practices (Fox et al., 2015). Consistent hand hygiene with the use of alcohol-based hand rubs decreases hospital infection rates (Monistrol et al., 2012).

The research site's Hematology/Oncology nurses have a need for more direct training on hand hygiene practices and hospital-acquired infection prevention practices. Based on the discussions from the literature, effective hand hygiene guidelines and training decrease hospital infections. The lack of training and guidelines received by the research site's nurses can hinder them from preventing the spread of HAIs optimally.

High volume nursing units and the feeling of being rushed to treat patients serves as a barrier in carrying out hand hygiene compliance at the research site's

Hematology/Oncology units. According to the literature, nurses are regularly in close proximity to patients when providing care for them. Nurses are also in close contact with patient's friends and families as well. Nurses are contaminated at some point while caring for their patient's, either by touching a diseased patient or by touching uncleaned external parts, such as patient care equipment and hospital devices (Kampf & Löffler, 2010). Hand hygiene practices are expected to safeguard the lives of patients while they are receiving medical care at healthcare facilities.

The research site's Hematology/Oncology full-time nurses work 12-hour shifts for at least 3 days a week, and it is imperative that constant and appropriate hand hygiene is executed throughout their shifts in order to uphold the notion of best practice and protection from HAIs while conforming to hand hygiene associated actions. Increased volume and nurses feeling rushed to care for patients can cause a break in hand hygiene practices. Some of the respondents made known during the interview that when it gets busy in the unit, it can be a challenge to remember to perform all of the 5 Moments for Hand Hygiene. One respondent stated "Sometimes the pressure put on us to hurry up and treat these patients causes me to get sidetrack. Sometimes I can't remember if I washed my hands or not since I'm always rushing."

According to Carter et al. (2016), crowding in patient treatment spaces can be identified as a barrier to excellent hand hygiene compliance among nurses. High workloads and overpopulated settings can be recognized as barriers to proper and consistent hand hygiene compliance (Salmon & McLaws, 2015). In order to increase and support positive attitudes of nurses towards hand hygiene and increase hand hygiene compliance, the nurse to patient ratio must be achievable. A possible solution to increase

patient load or busyness or feeling rushed to care for patients is to increase the nursing staff by hiring more capable nurses and/or schedule a reasonable amount of patients for each shift if possible.

Limitations of the Study

Possible limitations of this study include: researcher interpretive bias. In qualitative research the analysis and interpretation of the data are reliant on the researcher; they can potentially be biased because of a researcher's own culture, and ideology (Creswell, 2013). Also, the relatively small sample size could be considered a potential limitation; however, the researcher's goal was not to generalize to a large population but to gain an in-depth understanding of the experiences of nurses with regard to hand hygiene at the research site.

Summary

Chapter 5 includes an analysis of the results of this research study, in order to present an assessment and opinion of the effects brought about by the research site's nurses' hand hygiene attitudes, practices, and barriers, as well as to confer how the results addressed the study's research questions. This research study explored the experiences of nurses at the research site's Oncology/Hematology departments with regard to hand hygiene practices, attitudes, and barriers. The researcher utilized a phenomenological approach and collected data through direct observations and semi-structured interviews with nursing staff.

A thematic analysis of the data collected resulted in four emergent themes: Hand Hygiene Practices, Hand Hygiene Encouragement/Enforcement, Barriers to Hand Hygiene, and Nurses' Attitudes Towards Hand Hygiene. The theory of reasoned action

was drawn upon to understand the behavioral intent of nurses' at the research site's Hematology/Oncology units. This theory anticipates that behavioral intent is developed in the mind or brought about by two specific determinants: People's attitudes and their personal experiences (Banerjee et al., 2011). Specifically, in this research study, the nurses' held positive intentions in complying with hand hygiene practices because they believe it is important in preventing and reducing infections in their respective units. All in all, the findings of this study may be useful to the research site and other hospitals who find decreasing hospital-acquired infections to be challenging.

References

Al-Kadi, A., & Ahmad-Salati, S. (2012). Hand hygiene practices among medical students. *Interdisciplinary Perspectives on Infectious Diseases*, 2012, 1–6. https://doi.org/10.1155/2012/679129

Al-Tawfiq, J. A., & Pittet, D. (2013). Improving hand hygiene compliance in healthcare settings using behavior change theories: Reflections. *Teaching and Learning in Medicine*, *25*(4), 374–382. https://doi.org/10.1080/10401334.2013.827575

Aragon, D., Sole, M. L., & Brown, S. (2005). Outcomes of an infection prevention project focusing on hand hygiene and isolation practices. *AACN Clinical Issues: Advanced Practice in Acute and Critical Care*, *16*(2), 121–132. https://doi.org/10.1097/00044067-200504000-00002

Banerjee, S. C., Siriwardena, A. N., & Iqbal, M. (2011). What influences pre-hospital cannulation intentions in paramedics? An application of the theory of reasoned action. *Journal of Evaluation in Clinical Practice*, *17*(1), 84–90. https://doi.org/10.1111/j.1365-2753.2010.01372.x

Barrera, L., Zingg, W., Mendez, F., & Pittet, D. (2011). Effectiveness of a hand hygiene promotion strategy using alcohol-based handrub in 6 intensive care units in Colombia. *American Journal of Infection Control*, *39*(8), 633–639. https://doi.org/10.1016/j.ajic.2010.11.004

Boev, C., & Xia, Y. (2015). Nurse-physician collaboration and hospital-acquired infections in critical care. *Critical Care Nurse*, *35*(2), 66–72. https://doi.org/10.4037/ccn2015809

Bolton, P. M., Rivas, K., Prachar, V., & Jones, M. P. (2015). The observer effect: can being watched enhance compliance with hand hygiene behavior? A randomized trial. *Asia Pacific Journal of Health Management*, *10*(3), GS14–GS16. Retrieved from http://hdl.handle.net/1959.14/1065713

Bota, R., Ahmed, M., Jamali, M. S., & Azeem, Q. (2013). Knowledge and self-perceived practices regarding infection control among nursing students of a tertiary care hospital. *American Journal of Infection Control*, *41*(11), 1143–1144. https://doi.org/10.1016/j.ajic.2013.03.308

Carter, E. J., Wyer, P., Giglio, J., Jia, H., Nelson, G., Kauari, V. E., & Larson, E. L. (2016). Environmental factors and their association with emergency department hand hygiene compliance: an observational study. *BMJ Quality & Safety*, *25*(5), 372–378. https://doi.org/10.1136/bmjqs-2015-004081

Centers for Disease Control and Prevention. (2016). HAI data and statistics. *Healthcare-associated Infections*. Retrieved from http://www.cdc.gov/hai/surveillance/

Centers for Disease Control and Prevention. (2017). Show me the science-when and how to use hand sanitizer. *Handwashing: Clean Hands Save Lives*. Retrieved from https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html

Changing hospital culture. (2010). *Industrial Engineer: Engineering and Management Solutions at Work, 42*(4), 14–15. Retrieved from http://www.iise.org/IEMagazine/Issue.aspx?IssueMonth=04&IssueYear=2010

Chen, J.-C, Wu, K.-S., Lee, S. S.-J., Lin, H.-S., Tsai, H.-C., Li, C.-H., & . . . Chen, Y.-S. (2016). Impact of implementation of the World Health Organization multimodal hand hygiene improvement strategy in a teaching hospital in Taiwan. *American Journal of Infection Control*, *44*(2), 222–227. https://doi.org/10.1016/j.ajic.2015.10.004

Creedon, S. A. (2006). Infection control: Behavioural issues for healthcare workers. *Clinical Governance: An International Journal, 11*(4), 316–325. https://doi.org/10.1108/14777270610708850

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Los Angeles, CA: Sage.

Erasmus, V., Brouwer, W., van Beeck, E. F., Oenema, A., Daha, T. J., Richardus, J. H., . . . & Brug, J. (2009). A qualitative exploration of reasons for poor hand hygiene among hospital workers: Lack of positive role models and of convincing evidence that hand hygiene prevents cross-infection. *Infection Control and Hospital Epidemiology*, *30*(5), 415–419. https://doi.org/10.1086/596773

Fox, C., Wavra, T., Drake, D. A., Mulligan, D., Bennett, Y. P., Nelson, C., & . . . Bader, M. K. (2015). Use of a patient hand hygiene protocol to reduce hospital-acquired infections and improve nurses' hand washing. *American Journal of Critical Care*, *24*(3), 216–224. https://doi.org/10.4037/ajcc2015898

Gould, D. J., Moralejo, D., Drey, N., & Chudleigh, J. H. (2010). Interventions to improve hand hygiene compliance in patient care. *The Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.cd005186.pub3

Hansen, S., Schwab, F., Gastmeier, P., Pittet, D., Zingg, W., Sax, H., & . . . Wu, A. W. (2015). Provision and consumption of alcohol-based hand rubs in European hospitals. *Clinical Microbiology and Infection*, *21*(12), 1047–1051. https://doi.org/10.1016/j.cmi.2015.09.019

Hart, T. (2013). Promoting hand hygiene in clinical practice. *Nursing Times*, *109*(38), 14–15. Retrieved from http://europepmc.org/abstract/med/24313109

Healthcare-acquired infections: Culture over campaigns. (2014). *Health Leaders*, *17*(5), 44–48. Retrieved from http://www.healthleadersmedia.com/roundtable/healthcare-acquired-infections-culture-over-campaigns

Hoff, T., Hartmann, C. W., Soerensen, C., Wroe, P., Dutta-Linn, M., & Lee, G. (2011). Making the CMS payment policy for healthcare-associated infections work: Organizational factors that matter. *Journal of Healthcare Management*, *56*(5), 319–335. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3998712/

Hübner, N.-O, Hübner, C., & Kramer, A. (2013). Impact of health campaign on hand hygiene with alcohol-based hand rubs in a non-clinical setting. *The Journal of Hospital Infection*, *83*(1), S23–S28. https://doi.org/10.1016/s0195-6701(13)60006-7

Kalenić, S., Budimir, A., Bosnjak, Z., Acketa, L., Belina, D., Benko, I., & ... Juraga, A. T. (2011). Guidelines on hand hygiene in health care institutions. *Lijecnicki Vjesnik*, *133*(5–6), 155–170. Retrieved from https://lijecnicki-vjesnik.hlz.hr/lijecnicki-vjesnik/smjernice-za-higijenu-ruku-u-zdravstvenim-ustanovama/

Kampf, G., & Löffler, H. (2010). Hand disinfection in hospitals-benefits and risks. *JDDG: Journal der Deutschen Dermatologischen Gesellschaft*, *8*(12), 978–983. https://doi.org/10.1111/j.1610-0387.2010.07501.x

Lobdell, K. W., Stamou, S., & Sanchez, J. A. (2012). Hospital-acquired infections. *Surgical Clinics of North America*, *92*(1), 65–77. https://doi.org/10.1016/j.suc.2011.11.003

Mathur, P. (2011). Hand hygiene: Back to the basics of infection control. *The Indian Journal of Medical Research*, *134*(5), 611–620. https://doi.org/10.4103/0971-5916.90985

McInnes, E., Phillips, R., Middleton, S., & Gould, D. (2014). A qualitative study of senior hospital managers' views on current and innovative strategies to improve hand hygiene. *BMC Infectious Diseases*, *14*(1), 611–622. https://doi.org/10.1186/s12879-014-0611-3

Momen, K. S. (2012). *Identifying nursing activities to estimate the risk of cross-contamination* (Unpublished doctoral dissertation). University of Toronto, Ontario, Canada.

Monistrol, O., Calbo, E., Riera, M., Nicolás, C., Font, R., Freixas, N., & Garau, J. (2012). Impact of a hand hygiene educational programme on hospital-acquired infections in medical wards. *Clinical Microbiology and Infection*, *18*(12), 1212–1218. https://doi.org/10.1111/j.1469-0691.2011.03735.x

Morisky, D. E. (2002). Theory of reasoned action. *Encyclopedia of Public Health*. Retrieved from http://www.encyclopedia.com/doc/1G2-3404000842.html

Neo, J. R. J., Sagha-Zadeh, R., Vielemeyer, O., & Franklin, E. (2016). Evidence-based practices to increase hand hygiene compliance in health care facilities: An integrated review. *American Journal of Infection Control*, *44*(6), 691–704. https://doi.org/10.1016/j.ajic.2015.11.034

Owolabi, E. O. (2015). Attitude and practice of nurses towards aseptic technique in the prevention of surgical site infections. *African Journal for Physical, Health Education, Recreation and Dance*, *21*(2.2), 257–270. Retrieved from https://journals.co.za/content/journal/10520/EJC-51e8ee04f

Pan, S.-C., Tien, K.-L., Hung, I.-C., Lin, Y.-J., Sheng, W.-H., Wang, M.-J., & . . . Chen, Y.-C. (2013). Compliance of health care workers with hand hygiene practices: Independent advantages of overt and covert observers. *PLoS ONE*, *8*(1), e53746. https://doi.org/10.1371/journal.pone.0053746

Polat, S., Gürol, A. P., & Çevik, U. (2011). Hand hygiene compliance of nurses: A 5-unit observational study in North-Eastern Anatolia. *International Journal of Nursing Practice*, *17*(4), 435–440. https://doi.org/10.1111/j.1440-172x.2011.01954.x

Reinhard, S. C., Given, B., Petlick, N. H., & Bemis, A. (2008). Supporting family caregivers in providing care. In R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses* (pp. 347–411). Retrieved from https://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/nurseshdbk.pdf

Salmon, S., & McLaws, M.-L. (2015). Qualitative findings from focus group discussions on hand hygiene compliance among health care workers in Vietnam. *American Journal of Infection Control*, *43*(10), 1086–1091. https://doi.org/10.1016/j.ajic.2015.05.039

Saman, D. M., Kavanagh, K. T., & Abusalem, S. K. (2013). Redefining the standardized infection ratio to aid in consumer value purchasing. *Journal of Patient Safety*, *9*(2), 55–58. https://doi.org/10.1097/pts.0b013e3182809f31

Seibert, D. J., Speroni, K. G., Oh, K. M., DeVoe, M. C., & Jacobsen, K. H. (2014). Preventing transmission of MRSA: A qualitative study of health care workers'

attitudes and suggestions. *American Journal of Infection Control*, *42*(4), 405–411. https://doi.org/10.1016/j.ajic.2013.10.008

Seto, W. H., Ching, T. Y., Yeuen, K. Y., Chu, Y. B., & Seto, W. L. (1991). The enhancement of infection control in service education by ward opinion leaders. *American Journal of Infection Control*, *19*(2), 86–91. https://doi.org/10.1016/0196-6553(91)90044-d

Sharif, A., Arbabisarjou, A., Balouchi, A., Ahmadidarrehsima, S., & Kashani, H. H. (2016). Knowledge, attitude, and performance of nurses toward hand hygiene in hospitals. *Global Journal of Health Science*, *8*(8), 57–65. https://doi.org/10.5539/gjhs.v8n8p57

Shindo, M. B., & Mohite, V. R. (2014). A study to assess knowledge, attitude and practices of five moments for hand hygiene among nursing staff and students at a tertiary care hospital at Karad. *International Journal of Science and Research*, *7*(2), 311–321. Retrieved from https://www.researchgate.net/publication/265784827

Shukla, U., Chavali, S., & Menon, V. (2014). Hand hygiene compliance among healthcare workers in an accredited tertiary care hospital. *Indian Journal of Critical Care Medicine*, *18*(10), 689–693. https://doi.org/10.4103/0972-5229.142179

Sickbert-Bennett, E. E., DiBiase, L. M., Willis, T. M. S., Wolak, E. S., Weber, D. J., & Rutala, W. A. (2016). Reducing health care–associated infections by implementing a novel all hands on deck approach for hand hygiene compliance. *American Journal of Infection Control*, *44*(5), e13–e16. https://doi.org/10.1016/j.ajic.2015.11.016

Spruce, L. (2013). Back to basics: Hand hygiene and surgical hand antisepsis. *AORN Journal*, *98*(5), 449–460. https://doi.org/10.1016/j.aorn.2013.08.017

Stone, P. W., Glied, S. A., McNair, P. D., Matthes, N., Cohen, B., Landers, T. F., & Larson, E. L. (2010). CMS changes in reimbursement for HAIs: Setting a research agenda. *Medical Care*, *48*(5), 433–439. https://doi.org/10.1097/mlr.0b013e3181d5fb3f

Tippin, L. (2015). Infection prevention: The role of proper hand hygiene. *Occupational Health & Safety*. Retrieved from https://ohsonline.com/Articles/2015/02/01/Hand-Hygiene.aspx

Ward, D. J. (2012). Attitudes towards infection prevention and control: An interview study with nursing students and nurse mentors. *BMJ Quality and Safety*, *21*(4), 301–306. https://doi.org/10.1136/bmjqs-2011-000360

World Health Organization. (2013). WHO encourages patient participation for hand hygiene in health care. *Media centre*. Retrieved from http://www.who.int/mediacentre/news/releases/2013/hand_hygiene_20130503/en/

World Health Organization. (2017). About SAVE LIVES: Clean your hands. *Clean Care is Safer Care*. Retrieved from http://www.who.int/gpsc/5may/background/5moments/en/

APPENDIX A. STATEMENT OF ORIGINAL WORK

Academic Honesty Policy

Capella University's Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

The following standards for original work and definition of *plagiarism* are discussed in the Policy:

> Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)
>
> Plagiarism is one example of academic dishonesty. Plagiarism is presenting someone else's ideas or work as your own. Plagiarism also includes copying verbatim or rephrasing ideas without properly acknowledging the source by author, date, and publication medium. (p. 2)

Capella University's Research Misconduct Policy (3.03.06) holds learners accountable for research integrity. What constitutes research misconduct is discussed in the Policy:

> Research misconduct includes but is not limited to falsification, fabrication, plagiarism, misappropriation, or other practices that seriously deviate from those that are commonly accepted within the academic community for proposing, conducting, or reviewing research, or in reporting research results. (p. 1)

Learners failing to abide by these policies are subject to consequences, including but not limited to dismissal or revocation of the degree.

Statement of Original Work and Signature

I have read, understood, and abided by Capella University's Academic Honesty Policy (3.01.01) and Research Misconduct Policy (3.03.06), including the Policy Statements, Rationale, and Definitions.

I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA Publication Manual.

Type	
Learner name and date	Gainson Fan 6/9/2017
Mentor name	Heather Alonge 6/9/2017

APPENDIX B. OCTOBER 2015 - MARCH 2016, SIR GOALS FOR CDIF AND MRSA

Research Site Infection Prevention Scorecard

Value Based Purchasing ▸		VBP Threshold	Oct-15	Nov-15	Dec -15	Jan-16	Feb-16	Mar-16
CDIF SIR◥	#Infections/Exp Infections	≥ 0.750	🔴	0.90		🟡	0.47	
MRSA SIR ◥	#Infections/Exp Infections	≥ 0.799	🔴	0.81		🔴	1.00	

Note:

◥ Quarterly.

▸ SIR with Expected value <1 is shown as N/A, but is included in Performance Period Avg.

🔴 SIR expected value is higher than the goal appointed by the CMS for a three month period.

🟡 SIR expected value is close to the goal appointed by the CMS for a three month period.

APPENDIX C. INTERVIEW QUESTIONS

(Research Question 1: What are hand hygiene practices of nurses at the research site?)

Q1: Tell me about hand hygiene practices in your unit.

Q2: Describe your hand hygiene practices.

(Research Question 2: How are hand hygiene practices for nurses being encouraged and/or enforced by clinical leaders?)

Q3: What guidelines, if any, has your leadership provided your unit on hand hygiene practices?

Q4: What measures, if any, do your leaders take to evaluate hand hygiene practices in your unit?

(Research Question 3: What are barriers for nurses in carrying out hand hygiene practices?)

Q5: Do you face any challenges in practicing the five moments for hand hygiene?

Q6: Are there any barriers that prevent you from conducting hand hygiene practices? If so what are they?

Q7: Is there anything that makes conducting hand hygiene practices easier for you? If so, what?

Q8: Describe any training you have received on the research site's policy regarding infection control.

(Research Question 4: How are the attitudes of nurses impacting hand hygiene practices?)

Q9: What do you believe is the role of nursing staff in controlling infections?

Q10: When caring for patients, what activities do you perform that you would you say are

important to wash your hands afterward?

APPENDIX D. HAND HYGIENE OBSERVATION TOOL

Facility Name: _____

Unit: _____

Date: _____

Observation Time Start: _____

Observation Time End: _____

Audit Tool: **Hematology/Oncology Hand Hygiene Observations**

(Use an "X" for each "hand hygiene opportunity" observed. Under "opportunity successful," use an "X" if successful, and leave blank if not successful)

Clinical Staff Code	Hand Hygiene		Describe successful or missed attempts (i.e., Between patients.)
	Hand Hygiene Opportunity	Opportunity Successful	

Clinical Staff Code: 1. **N** = Nurse (RN) 2. **LPN** = Licensed Practical Nurse 3. **LVN** = Licensed Vocational Nurse

Duration of observation = _____ minutes

Total number of hand hygiene opportunities observed = _____

Total number of successful hand hygiene practices observed = _____