

2015

# Correctional Nurses' Knowledge and Perceptions of Methicillin-Resistant Staphylococcus aureus

Deborah Winbush  
*Walden University*

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

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Walden University  
2015

Abstract

Correctional Nurses' Knowledge and Perceptions of Methicillin-Resistant

*Staphylococcus aureus*

by

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MSN, University of North Carolina at Charlotte, 2005

BSN, University of North Carolina at Charlotte, 2000

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

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## Abstract

Since 1999, Methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks have occurred in many correctional facilities. Even after the Federal Bureau of Prisons developed clinical practice guidelines on the management of MRSA within correctional facilities, the prevalence of MRSA decreased only insignificantly. Other researchers suggested infection control compliance was equally as important as developing clinical practice guidelines in reducing the incidence of MRSA. Several studies identified the healthcare professionals' nonadherence and inconsistencies to clinical practice guidelines as contributors to MRSA transmission. Accordingly, this project was designed to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in correctional settings. Using the health belief model as the theoretical framework, this project examined the nurse professionals' perceptions as well as their level of knowledge regarding MRSA by using an original instrument, Knowledge and Health Beliefs Regarding MRSA Questionnaire. The study employed a quantitative design with a purposeful sample of 36 participants using social media. Through descriptive statistical analysis, it was determined that MRSA training and education were the greatest barriers among the nurse professionals in taking MRSA preventive action (64%,  $n = 23$ ). Based on the findings, assessing the educational needs of the nurse professionals must become the priority when designing infection control programs. This study contributes to social change by recognizing the potential health impact of MRSA and cautions that if public health officials do not control MRSA within correctional settings, such behavior can affect the transmission of MRSA both nationally and globally.

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## Dedication

I dedicate this project in the loving memory of my grandmother, Lillian Williams. Through her love and support, she instilled in me that nothing was impossible and that I could achieve my dreams. She will forever be missed and never forgotten.

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I would first like to give honor and glory to God for giving me the strength and wisdom to complete this task, because without Him none of this would be possible. To my husband, Charles, thank you for the encouragement and believing in me when I felt discouraged. I would not have been able to accomplish this task without your full support. To my children, Christopher, Cameron, Caleb, and Courtney, thank you for reminding me of why I work so hard to achieve one of life's greatest benefits. To my parents, thank you for your support and instilling in me that I could do all things through Christ, you both have been superior role models both professionally and spiritually. To my siblings, Felicia, Paris, and Prince, thank you for sharing in this experience with me. To my committee chair, Dr. Kathleen Wilson, my deepest appreciation and gratitude goes out to you for stepping in and giving me guidance and support throughout this process. I would also like to thank my committee member Dr. Stoerm Anderson for his honest feedback and guidance through the completion of this project. My sincerest gratitude to my research reviewer, Dr. Tracy Wright, thank you for sharing your wisdom. To the Walden University faculty, thank you for providing me with the educational tools to achieve my professional goals.

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## Section 1: Nature of the Project

### **Introduction**

*Staphylococcus aureus* (*S. aureus*) is the most recognized species within the genus *Staphylococcus* capable of causing skin and soft tissue infections (SSTIs) that include cellulitis, abscesses, and furunculosis (Webb & Czachor, 2009). Staphylococcal infections also frequently cause more invasive, life-threatening infections such as bacteremia, endocarditis, pneumonia, and sepsis (Deger & Quick, 2009; Felkner, et al., 2009; Webb & Czachor, 2009). Methicillin-resistant *S. aureus* (MRSA) is a resistant clone of *S. aureus* that is resistant to antibiotics called beta-lactams antimicrobial agents, including penicillins and cephalosporins (Gorwitz et al., 2008). MRSA emerged in the 1960s and is the most common antibiotic-resistant pathogen within hospitals, nursing homes, and long-term care facilities (Weber, 2005).

Hospital-associated MRSA (HA-MRSA) contributes significantly to increased morbidity and mortality, resulting in longer hospital stays and increasing healthcare costs (Chaberny, Bindseil, Sohr, & Gastmeier, 2008). MRSA is the most commonly known antibiotic-resistant pathogen within U.S. hospitals, and researchers observed the misuse of antimicrobial drugs to be an important factor in the rise of MRSA within the hospital setting (Nicastri et al., 2008). The risk is far greater for the development of MRSA with longer hospital stays and patients with compromised immune systems.

Traditionally, the risk factors associated with MRSA infections were linked to healthcare facilities. In the 1990s, MRSA from a strain genetically distinct from the HA-MRSA emerged in the community among previously healthy adults and children (Aiello,

Lowy, Wright, & Larson, 2006; Farley et al., 2008). Medical providers began seeing individuals in the community with MRSA with no known hospital or nursing home setting risk factors (Malcolm, 2011). This investigation prompted concern among health officials that MRSA was no longer confined to healthcare facilities but also existed among healthy individuals within the community.

Community-associated MRSA (CA-MRSA) has proven to be more troublesome than HA-MRSA as an emerging cause of skin abscesses and invasive life-threatening infections in otherwise healthy persons (Aiello et al., 2006; Malcolm, 2011). CA-MRSA has become a larger public health concern because of its capability to increase morbidity and mortality rates among otherwise healthy persons. Because CA-MRSA is a relatively new emerging isolate, the prevalence rates of CA-MRSA outside of the hospital setting are far below the prevalence of hospital patients with HA-MRSA (Malcolm, 2011).

The first national population-based prevalence survey was conducted in 2001 and 2002 to show measurable prevalence of CA-MRSA colonization in the community (Gorwitz et al., 2008). The National Health and Nutrition Examination Survey (as cited in Malcolm, 2011) estimated the community prevalence of MRSA colonization in 2003-2004 was significantly higher than the prevalence of MRSA colonization in 2001-2002, 1.5% versus 0.8% respectively. Most importantly, of all the positive *S. aureus* cultures, 5.4% were identified as MRSA positive in 2003-2004, compared to 2.5% in 2001 and 2002 (Malcolm, 2011).

While CA-MRSA has quickly emerged in the community setting, more confirmed outbreaks of MRSA have steadily risen in correctional facilities. However, there have

been very few published rates of CA-MRSA in the correctional setting (Baillargeon, Kelley, Leach, Baillargeon, & Pollack, 2004). Outbreaks of MRSA have occurred in multiple correctional facilities since 1999. In October 2000, the Mississippi State Department of Health notified the CDC of 31 inmates with MRSA who had no known MRSA infections in years prior (CDC, 2001). The investigation results revealed MRSA was transmitted person to person within the prison from asymptomatic carriers. In 2001, the CDC (2003) also investigated outbreaks of MRSA in Georgia, California, and Texas correctional facilities that were attributed to inadequate personal hygiene and infection control practices, barriers to medical care, and the improper prescribing of antimicrobial drugs. This investigation increased the awareness that correctional facilities were potential harborers of CA-MRSA (CDC, 2003; David, Mennella, Mansour, Boyle-Vavra, & Daum, 2008).

Correctional facilities provide a unique opportunity for MRSA transmission due to the presence of numerous risk factors (Farley et al., 2008; Malcolm, 2011). Likewise, MRSA has been identified to be more prevalent within the correctional population than in the general population. With the increasing rise of MRSA within the correctional setting, nursing professionals play a unique role in the control and transmission of MRSA. This study addressed the CA-MRSA knowledge and health beliefs of nursing professionals as they related to the compliance of recommended MRSA guidelines. Effectively reducing MRSA incidence and transmission in the correctional setting will likely reduce MRSA across all communities.



## **Background of the Problem**

Correctional facilities face unique challenges in eradicating CA-MRSA. Recent studies have reported risk factors of CA-MRSA to include crowded living facilities, poor hygiene, sharing of personal items, high rates of skin disease, and high rates of immunosuppression (Baillargeon et al., 2004). The most commonly known correctional facilities are prisons, jails, and detention centers. In these facilities, inmates or detainees are held for various periods from temporary to long-term sentences. Jails and detention facilities have a higher turnover rate because inmates have a shorter average length of stay as compared to inmates in prisons. This puts jails and detention facilities at a higher risk because they may receive more infected or colonized individuals from the community and have a higher rate of sending those newly infected or colonized back into the community, whereas prison inmates have a greater incidence of within prison transmission due to less frequent discharge of inmates (Malcolm, 2011).

Each year correctional facilities house and release millions of individuals from these facilities. Because many incarcerated individuals move through the correctional setting, the potential of spreading CA-MRSA between facilities and the community are greatly increased; which can potentially serve as the focus of dissemination of MRSA into the communities (David et al., 2008). The prevalence of CA-MRSA in the correctional setting has prompted a greater awareness among many public health officials in the prevention of MRSA in this setting (Malcolm, 2011).

The Federal Bureau of Prisons (FBOP; 2012) provided clinical practice recommendations on the management of MRSA for the prevention, treatment, and

control of MRSA within correctional facilities. When the concern of MRSA grew even more within the correctional setting, these guidelines were redeveloped to specifically discuss the management of MRSA in correctional facilities (Malcolm, 2011). All correctional settings (i.e. county and state jails, prisons, detention centers, and immigration detention centers) were encouraged to use these guidelines and develop standardized practice protocols to aid in the prevention, treatment, and containment of MRSA within their environment (FBOP, 2012).

Although clinical practice guidelines had emerged, there continued to be an insignificant decrease in MRSA infections within correctional settings. The Georgia Department of Corrections (as cited in CDC, 2003) identified 23 cases during July 2002 to August 2002 and it implemented interventions to control the spread of MRSA. Despite the measures of cohorting inmates with MRSA and providing a 5-day supply of chlorhexidine soap to the inmates, an additional 29 cases of MRSA were reported from March 2003 to May 2003 (CDC, 2003). According to the CDC (2003), the Texas Department of Criminal Justice also implemented a comprehensive set of prevention and treatment guidelines for MRSA; unfortunately, these guidelines did not lead to a substantial decrease in MRSA incidence rates.

Other studies suggested the implementation and sustainment of targeted interventions could lead to the decrease of MRSA in correctional facilities (Aiello et al., 2006; Baillargeon et al., 2004; Malcom, 2011; Weber, 2005). In 2001, a Georgia minimum-security state detention center implemented a facility-wide screening for skin disease after 11 cases of MRSA skin infections were identified and five of the 11 had

repeated MRSA skin infections (CDC, 2003). During December 2001 to May 2002, no MRSA cases were identified. Nevertheless, 14 new cases of MRSA were identified from June 2002 to November 2002 (CDC, 2003). Procedures for proper wound care, recommendations for inmate hygiene education, and antimicrobial use had to be reinforced to staff members (CDC, 2003). It is therefore necessary to place emphasis on not only developing clinical practice guidelines but also reinforcing staff member compliance in sustaining recommended MRSA practice guidelines.

It has become increasingly apparent that infection control compliance among nursing professionals was not optimal in reducing MRSA incidence and transmission (Wolf, Lewis, Cochran, & Richards, 2008). Several researchers have identified that the nonadherence to infection control practice guidelines by clinicians and the inconsistencies of compliance with infection control precautions have contributed to the transmission of resistant pathogens (Gammon, Morgan-Samuel, & Gould, 2007; Giblin et al., 2004; Osborne, 2003). A major challenge in national guideline implementation is achieving compliance among healthcare providers to read the guidelines, appreciate their importance, and incorporate them into their practice (Brinsley, Sinkowitz- Cochran, Cardo, & The CDC Campaign to Prevent Antimicrobial Resistance Team, 2005; Gammon et al., 2007; Stein, Makarawo, & Ahmed, 2003).

Studies have linked the adoption of infection control practices to the health beliefs of individuals concerning their perceived susceptibility to the infection and their ability to prevent transmission (Brinsley et al., 2005). Knowledge is essential in the prevention and control of MRSA (da Silva, de Carvalho, de Silva Canini, de Almeida Cruz, & Simones,

2010). Healthcare professionals who were compliant with infection control practices were more likely to have had adequate knowledge of evidence-based practice compared to their noncompliant colleagues (Brady, McDermott, Cameron, Graham, & Gibb, 2009). By examining the health beliefs and knowledge of the nurse professionals, improvements to infection control interventions and educational programs can be addressed.

### **Problem Statement**

The problem addressed in this study was the nursing professionals' inconsistency in complying with MRSA practice guidelines and recommendations in an effort to prevent and control MRSA in correctional settings. The investigative reports from the CDC (2001, 2003) indicated that the implementation of guidelines alone was not sufficient in decreasing the incidence of MRSA; rather the sustainment of interventions were also needed. The challenges of controlling MRSA not only involve eliminating risk factors associated with this population but also the adherence of infection control guidelines by nursing professionals involved in patient care delivery. While guidelines are developed to improve practice and patient outcomes, it is the compliance of these guidelines that reduces the incidence of MRSA.

### **Purpose Statement**

To address the problem statement, the purpose of this study was to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in correctional settings. By examining the nurses' level of knowledge regarding CA-MRSA prevention and risk, the information gathered would be useful in providing insight into the problems in current practice, reducing barriers, and

discovering the educational needs of the healthcare professionals. Knowledge alone is not sufficient in examining the prevention and risk and severity of CA-MRSA; the health beliefs of the nurses must also be considered. The health beliefs of the target population can be an efficient tool to provide insight on educational needs and other strategies needed to reduce CA-MRSA incidence and transmission in the correctional setting (da Silva et al., 2010; Wolf et al., 2008).

### **Research Questions**

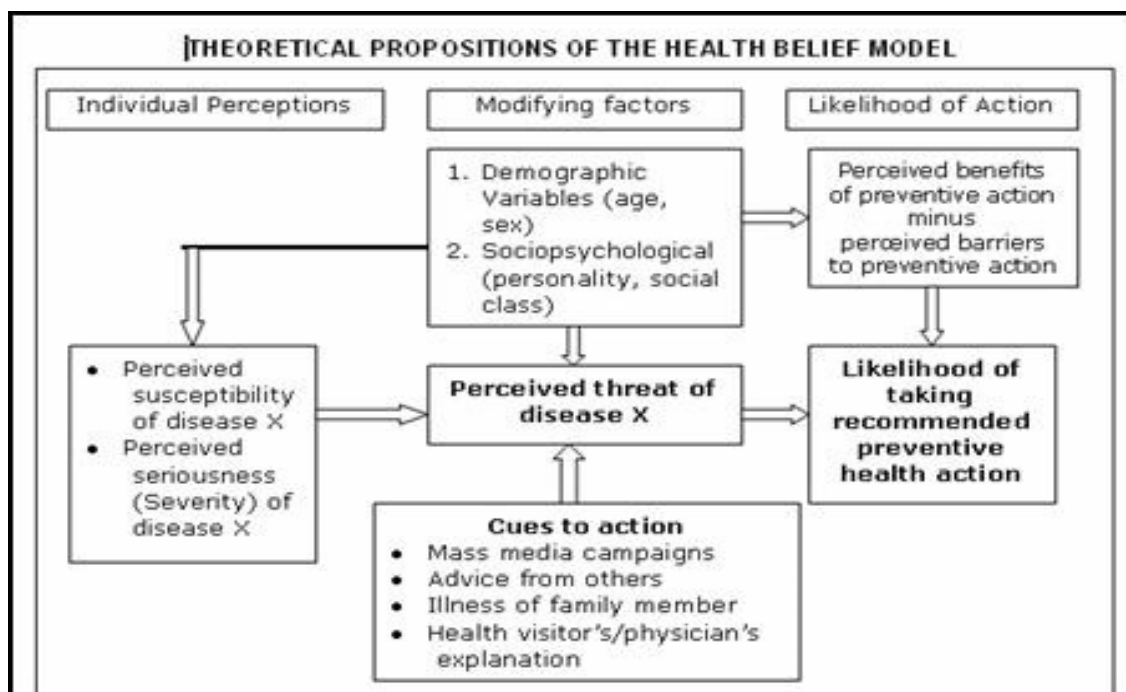
1. Among correctional health nurses, will the assessment of their health beliefs regarding prevention strategies, infection control resources, and their perceived risk and severity regarding MRSA provide interventions targeted to improve adherence to infection control practices?
2. What are the correctional nurses' level of knowledge regarding the prevention and the risk and severity of MRSA?
3. What are the identified barriers of the correctional nurses in maintaining compliance with MRSA infection control practices?

### **Theoretical Framework**

A group of investigators in the Public Health Service originally developed the health belief model (HBM) in the early 1950s (Rosenstock, 1974). The theory grew from a set of independent, applied research problems constructed to explain why individuals failed to use free or very low cost preventive services (Rosenstock, 1974). Social psychological theories dealing with an individual's subjective state of health behavior influenced the model (Rosenstock, 2005). The researchers believed health actions were

motivated by the degree of fear to avoid illness and the benefits obtained from alleviating illness (McEwen & Wills, 2011; Rosenstock, 1974). The HBM is most widely used for explaining health behaviors and has been studied in the context of many health problems (Carpenter, 2010).

The HBM suggests that by changing one's individual perception, one increases the likelihood of a positive health behavior change (McEwen & Wills, 2011). The model consists of several concepts that explain health behavior, including (a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, (d) perceived barriers, and (e) cues to action (Carpenter, 2010; Rosenstock, 1974). Another concept was added later that identified self-efficacy as an important factor in health behavior change (Carpenter, 2010). Scholars determined the overall knowledge and beliefs were not sufficient and individuals needed the overall motivation to change (McEwen & Wills, 2011). The HBM in Figure 1 depicts the concepts contributing to individual health beliefs. In assessing the health beliefs of a target population, the HBM can be used to strengthen program planning, encourage educators/supervisors to continue needs assessments, and target specific identified needs (Rosenstock, Strecher, & Becker, 1988).



*Figure 1.* Health belief model. From “Selected psychosocial models and correlates of individual health-related behaviors,” by M.H. Becker, D.P. Haefner, S.V. Kasl., et al., 1977, *Medical Care*, 15, p. 30. Reprinted with permission.

### Nature of the Project

The CA-MRSA specific clinical guidelines in the correctional system, developed by the FBOP (2012), outline protocols, diagnosis, treatment, and infection control preventive measures. During the investigation of MRSA outbreaks in the Georgia and Texas facilities, targeted interventions were implemented that led to the reduction of MRSA, but they were not sustained and additional MRSA outbreaks emerged (CDC, 2003). Researchers have claimed that the healthcare professionals failed to adhere to the MRSA clinical practice guidelines because previous procedures of proper wound care and antimicrobial use had to be reinforced (CDC, 2003). The HBM was used to examine and gain insight to suggest interventions needed to eliminate barriers and develop

resources and prevention strategies for healthcare professionals. This assessment of the nurses' beliefs regarding CA-MRSA was useful in strengthening future infection control programs.

Healthcare professionals have been known to practice selectively rather than using universal precautions, which results in unnecessary risk of infection transmission when engaging in patient care (Gammon et al., 2007; Giblin et al., 2004). Healthcare professionals are key to the control and prevention of CA-MRSA. Even with adequate practice guidelines, MRSA cannot be prevented unless healthcare professionals are compliant with the recommended infection control practices.

### **Definition of Terms**

Several terms are used throughout this study. The FBOP (2012) defined these terms as follows:

*Abscess*: An infection characterized by a localized accumulation of polymorphonuclear leukocytes with tissue necrosis involving the dermis and subcutaneous tissue.

*Beta lactam antibiotics*: Include penicillins, ampicillin, amoxicillin, amoxicillin/clavulanate, methicillin, oxacillin, dicloxacillin, cephalosporins, carbapenems (e.g., imipenem), and the monobactams (e.g., aztreonam).

*Carbuncles*: Consist of two or more confluent furuncles with separate heads.

*Cellulitis*: Involves deep subcutaneous infection of the skin typically by bacteria that results in a localized area of erythema and inflammation, with or without purulence.



*Colonization:* The presence of bacteria on or in the body without causing infection.

*Community-associated MRSA (CA-MRSA):* Refers to MRSA infection with an onset within the community, in an individual lacking risk factors for healthcare associated infections, such as recent hospitalization, surgery, residence in a long-term care facility, receipt of dialysis, or presence of invasive medical devices.

*Folliculitis:* Inflammation of the hair follicle that appears clinically as an eruption of pustules centered on hair follicles.

*Furuncle:* A well-circumscribed, painful, suppurative inflammatory nodule involving hair follicles that usually arises from preexisting folliculitis. Furuncles can occur anywhere on the skin surface that contains hair follicles and is subject to friction and maceration such as thighs, neck axillae, groin, and buttocks. They may extend into the dermis and subcutaneous tissues and often are associated with cellulitis.

*Hospital-associated MRSA (HA-MRSA):* Generally associated with recent hospitalization, surgery, residence in a long-term facility, receipt of dialysis, or the presence of invasive medical devices.

*Methicillin-resistant Staphylococcus aureus (MRSA):* Staph bacteria resistant to beta-lactam antibiotics, including penicillin, ampicillin, amoxicillin, amoxicillin/clavulanate, methicillin, oxacillin, dicloxacillin, cephalosporins, carbapenems (e.g., imipenem), and the monobactams (e.g., aztreonam). MRSA causes the same types of infections as does staphylococcal bacteria that are sensitive to beta lactam antibiotics.

*Staphylococcus aureus (S. aureus)*: A commonly occurring bacterium, often referred to as “staph,” that is carried on the skin and in the nose of healthy persons. *S. aureus* may cause minor SSTIs such as boils as well as more serious infections such as wound infections, abscesses, pneumonia, and sepsis.

### **Assumptions**

CA-MRSA is a growing problem within correctional settings and will continue to be a public health concern. If nurses adhere to clinical practice guidelines on the prevention and transmission of CA-MRSA, this will reduce the spread of infection within the correctional population. In addition, if the nurses perceive CA-MRSA as a threat, they are most likely to take the recommended preventive actions. What is more, if nurses’ level of knowledge regarding CA-MRSA is accurate, they are more likely to adhere to the clinical practice guidelines consistently compared to those nurses who may not have accurate knowledge.

### **Limitations**

The knowledge and health beliefs of the nurses were limited to correctional nurses who agreed to participate in this study. Therefore, generalizing to all U.S. correctional settings is not appropriate. Another limitation of this project was the small sample size of correctional nurses who agreed to participate. The study consisted of nurses who chose to volunteer to participate, and their responses might have been different from those who chose not to volunteer. There was the likelihood that the perceptions of the sample population did not truly represent all nurses in all correctional settings.

### **Significance of the Study**

Identifying nurses' health beliefs and their level of knowledge regarding MRSA can assist in developing strategies that will contribute to the sustainment of interventions and how healthcare professionals deliver care to MRSA-infected patients (da Silva et al., 2010). Some researchers have argued health actions are motivated by a person's degree of fear and the benefits obtained when adopting preventive health measures (Carpenter, 2010), suggesting health behaviors are influenced by one's perception of the severity of negative health outcomes. Knowledge is the first step in influencing behavior change and adherence to clinical practice guidelines (Brady et al., 2009; Easton et al., 2007). According to Rosenstock (1974), one's level of knowledge regarding the health problem partly influences perceived susceptibility and severity. Other variables such as sociodemographics and additional background characteristics also influence health beliefs of healthcare professionals (Wolf et al., 2008).

### **Implications for Social Change in Practice**

The correctional setting is a potential reservoir for MRSA. Therefore, by identifying and effectively treating MRSA within correctional settings, MRSA will likely reduce across all communities. It is important that correctional facilities have protocols and prevention guidelines in place to prevent the transmission of MRSA. The correctional population travels in and out of correctional settings, and if the transmission of CA-MRSA from person to person within this setting is ignored, the potential health problem can become worldwide. Because CA-MRSA can be transmitted easily within the correctional population, making a difference within this community to prevent the

transmission of CA-MRSA has implications for social change both nationally and globally while also decreasing the morbidity and mortality rates associated with CA-MRSA infections. By better understanding the transmission and control of CA-MRSA, public health officials can begin to develop future interventions that will help promote the reduction of CA-MRSA within the United States.

### **Summary**

The emergence of CA-MRSA among healthy people with no known hospital exposure created the awareness that MRSA could not only be found in the hospital but also within the community. With the rise of MRSA within correctional facilities, this increased awareness that the correctional population could potentially spread MRSA beyond the facilities. This prompted the FBOP (2012) to release clinical practice guidelines providing clinicians with recommendations to prevent, treat, and contain MRSA. The research identified that these practice guidelines alone were not the sole solution in eliminating MRSA but that healthcare provider compliance was suboptimal (Gammon et al., 2007). The identified challenge of controlling MRSA within correctional settings was maintaining adherence to infection control guidelines. Earlier investigations within correctional facilities proved this (CDC, 2003). The purpose of this study was to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in the correctional setting.

By examining the level of knowledge regarding CA-MRSA prevention and risk factors, the information gathered would be useful in targeting interventions that meet the specific needs of the nursing professionals to prevent and control MRSA transmission in

correctional settings (da Silva et al., 2010). However, knowledge alone is not sufficient in identifying the needs of the nursing professionals; the health beliefs of the nursing professionals must also be considered (Brinsley et al., 2005). Individual knowledge influences one's health beliefs. The HBM was used to identify the needs of the healthcare professionals, gain insight needed to eliminate barriers, and develop resources for implementation and prevention strategies (Rosenstock, 1974). This assessment will be useful in strengthening future infection control programs.

## Section 2: Review of Literature and Theoretical and Conceptual Framework

The healthcare professionals' inconsistency in complying with MRSA practice guidelines and recommendations to prevent and control MRSA in the correctional setting has motivated this study. The primary objective of this literature review was to examine the impact of MRSA within the correctional system and the healthcare professionals' level of knowledge and health beliefs that influence MRSA prevention and control. With no research studies in the literature addressing these factors in correctional settings, this literature review evaluated the impact of healthcare professionals' level of knowledge and health beliefs on compliance in infection control measures from other settings. The review also evaluated research articles discussing prevention, treatment recommendations, and risk factors. I used the Walden Library database to access these articles, using CINAHL and MEDLINE simultaneously, searching English, peer-reviewed articles only dated 2000 to 2013. Key search words included *MRSA* and *prison\** or *incarcerat\**, *MRSA* and *health belief model*, *MRSA* and *knowledge*, and *healthcare professionals*.

### **MRSA in the Correctional System**

The correctional population is a higher risk group for CA-MRSA compared to those who have not been incarcerated (Aiello et al., 2006; David et al., 2008; & Malcolm, 2011). By the end of 2012, there were over 2.2 million adults incarcerated in U.S. federal and state prisons, and local jails (Glaze & Herberman, 2013). This included 609,800 offenders admitted to state or federal prisons in 2012 and 637,400 released by the end of 2012 (Carson & Golinelli, 2013). These numbers not only highlight the risk of CA-

MRSA within correctional settings, but also illustrate the potential reservoir of CA-MRSA infection in the community. With the average yearly releases of approximately 600,000 offenders, the correctional population may be an important source of CA-MRSA transmission and a place to educate staff and the incarcerated on the risk of MRSA infection (Carson & Golinelli, 2013; Malcolm, 2011; Maree et al., 2010).

CA-MRSA outbreaks have emerged in various correctional populations in which the most recent outbreaks have occurred (Baillargeon et al., 2004; David et al., 2008; Malcolm, 2011; Pan et al., 2003). The challenges of controlling CA-MRSA within correctional settings are a result of the numerous risk factors for MRSA infection. These consist of crowded living conditions, prolonged incarceration, poor hygiene, history of antimicrobial use, sharing soap and personal items, comorbidities, not properly cleaning uniforms and undergarments, outdoor work assignments, aging, a disproportionate number of homeless people, and self-draining boils (Baillargeon et al., 2004; Malcolm, 2011; Maree et al., 2010). Because of the numerous risk factors associated with MRSA infection and transmission within this setting, the correctional system is a potential reservoir for MRSA colonization and infection.

Earlier investigations conducted by the CDC (2003) traced the emergence of MRSA in the correctional system. Outbreaks in Georgia, California, and Texas correctional facilities suggested CA-MRSA was a potential problem in this environment. The investigation discovered many of these facilities did not have adequate guidelines to control and prevent CA-MRSA (CDC, 2003). Although these outbreaks were being

reported, there was no system to identify and examine the overall incidence of MRSA infections in correctional facilities.

A cohort study examined the overall incidence of MRSA in the Texas prison population (Baillargeon et al., 2004). This study examined seven classifications of diseases associated with MRSA: (a) circulatory disease, (b) cardiovascular disease, (c) diabetes, (d) end stage liver disease, (e) end stage renal disease, (f) HIV/AIDS, and (g) skin conditions. These findings revealed an increase in MRSA infection incidence among inmates with HIV/AIDS, end stage liver disease, and end stage renal disease. Because these diseases may place an inmate at increased risk for MRSA infection, healthcare providers need to screen these groups more efficiently and determine appropriate antibiotic treatment to prevent any negative outcomes (Baillargeon et al., 2004; Maree et al., 2010; Webb & Czachor, 2009).

A cross sectional study explored the prevalence of MRSA colonization, using active surveillance to detect MRSA nasal colonization at the time of arrest (Farley et al., 2008). Of the total population, 15.8% (95/602) had MRSA nasal isolates. This prevalence rate was substantially greater than that among the largest and most representative community in Baltimore, Maryland (0.84%). The identified strains of MRSA were unique to certain regions during the outbreaks of Los Angeles County jail but had a widespread geographic distribution infecting Chicago jail inmates (Malcolm, 2011; Maree et al., 2010). This suggested there may be a community-to-jail transmission link contributing to the rising incidence of MRSA within the prison environment. However, the inmates reporting a previous arrest were significantly more likely to be colonized



with MRSA when compared to those with no prior arrest history. This observation provided more evidence that correctional facilities may be potential harborers of MRSA (Farley et al., 2008).

To control CA-MRSA within the correctional system, scholars and healthcare practitioners need a better understanding of the risk factors for infection. In a case control study, Maree et al. (2010) investigated the behavioral risk factors associated with MRSA in two Los Angeles County jails from October 2006 through January 2007. The study included 60 case patients and 100 controlled subjects. No significant differences existed between the case and control group regarding demographics and comorbidities, but the case patients had a higher MRSA colonization (35%) compared to the control group (11%). MRSA colonization was significantly associated with not showering in the jail in the previous week, antibiotic use in the last 12 months, and current MRSA skin infections (Maree et al., 2010). Three factors only associated with the jail were not showering daily, not having heard of *staph*, and sharing soap with other inmates. Recommended interventions involved educating the inmates about *staph*, providing liquid soap, and encouraging the daily showering to decrease the MRSA infection risk.

Community-based interventions have been successful in reducing MRSA within correctional settings (Elias, Chaussee, McDowell, & Huntington, 2010). Elias et al. (2010) reported 64 clinic visits from inmates related to skin infections during the observation period. The researchers obtained bacterial cultures from 26 inmates with draining wounds or after an incision and drainage. Of these 26 cultures, only 19 (73.1%) grew MRSA. During the preintervention period, 23 of the 64 clinic visits occurred but

only one culture was obtained. During the active observation stage, the researchers identified key factors promoting MRSA transmission (Elias et al., 2010). They used these key findings to implement interventions aimed at improving infection control during the implementation stage. Antibacterial bar soap and chlorhexidine liquid soap were issued to all inmates with any sign of or known MRSA infection. Inmates were encouraged to shower twice daily and avoid sharing personal hygiene items. They were cohorted until after completion of successful treatment and the change in the laundry process. These changes resulted in a decrease in MRSA culture positive results from 86.7% to 33.3% (Elias et al., 2010). In a Wisconsin correctional facility, the sharing of tattoo paraphernalia was linked to the CA-MRSA outbreak, again establishing the importance of avoiding shared personal items (Stemper et al., 2006).

David et al. (2008) conducted an 18-month surveillance on the predominance of MRSA infection in a large urban jail. Of the 301 detainees with SSTIs, 283 (94%) had *S. aureus* and 240 (79%) had MRSA (David et al., 2008). Among the detainees with MRSA and methicillin-susceptible *S. aureus* (MSSA), there were no significant differences to a known exposure to antibiotics in the year prior and no significant comorbidities. However, MRSA was more likely to be isolated from an abscess whereas the MSSA was more likely to be isolated from a surgical site. The recurrence among the initial 283 with *S. aureus* were 20 within 6 months, five within 30 days, five at 31 to 60 days, and the remainder at 61 to 180 days. The majority, at 95%, were recurrences from those detainees who initially had MRSA (David et al., 2008). No significant differences existed in the

recurrence rates with the antibiotic regimen prescribed. This would suggest that the recurrences of MRSA might also be due to environmental exposures.

In another case control study, Turabelidze et al. (2006) examined the risk factors associated with MRSA outbreaks within a Missouri prison and focused on personal hygiene factors. The case patients were more likely to have shared personal items, least likely to wash personal items themselves, and tended to wash their hands and shower less often when compared to the control group (Turabelidze et al., 2006). While controlling the sociodemographics and other risk factors, poor personal hygiene significantly increased the risk of MRSA infection. These results identified the cause of MRSA infections to be likely a result from within-jail transmission rather than community-to-jail transmission. The researchers also identified potential MRSA transmission through contaminated surfaces and concluded, based on these results, that the prison environment can be easily contaminated by MRSA (Felkner et al., 2009; Turabelidze et al., 2006).

In an investigation of jail environmental surfaces, Felkner et al (2009) examined 132 swabs taken from surfaces in the health services building, inmate housing, kitchen, laundry facility, and vehicles. They found *S. aureus* on 10 surfaces within the facility, excluding the kitchen and laundry facilities, and eight of these were positive MRSA surfaces. Although MRSA-positive environmental surfaces in the healthcare setting were reportedly larger than in the correctional setting, the proportion of *S. aureus* isolates that were methicillin-resistant (80%) was much higher than the proportions reported in healthcare facilities, which ranged from 16% to 59% (Felkner et al., 2009). These findings emphasize the importance of infection control guidelines that include protocols

for environmental surface cleaning to eliminate MRSA infections and outbreaks (Turabelidze et al., 2006).

### **MRSA Knowledge and Health Beliefs**

Considering the potential impact of MRSA within correctional settings, a proactive approach from correctional staff and healthcare personnel is needed to control the spread of MRSA. Even with effective guidelines and protocols used to guide infection control measures, these measures are useless if staff does not follow the guidelines consistently. Weber and Czachor (2009) demonstrated areas needing improvement, particularly focusing on education for both staff and inmates on MRSA awareness. Additionally, they emphasized the importance of MRSA education to include transmission, prevention, treatment, and containment to eliminate MRSA.

Effective means of reducing MRSA and improving infection control practices depends on the individual's perception of controlling a health problem and implementing recommended infection control practices (Wolf et al., 2008). Healthcare professionals are key players in controlling and preventing MRSA in correctional settings. In a descriptive study evaluating the nursing team's adherence to preventive measures, the results showed an astonishing 43.7% of nurses did not know the basics of MRSA (da Silva et al., 2010). However, while knowledge of a particular health problem is important, it does not determine if a health professional will comply with preventive measures. Understanding the health professional's knowledge along with their health beliefs will be an efficient tool in evaluating infection control practices and adherence to preventive measures (da Silva et al, 2010).

The knowledge and awareness of MRSA among healthcare workers are critical in the adherence of infection control guidelines. Brady et al. (2009) developed a questionnaire survey to evaluate the knowledge of MRSA practice guidelines in the United Kingdom. The participants were composed of a sample population of doctors, trainee surgeons, nonclinical members, and infection control nurses. The study provided current evidence that poor levels of MRSA practice guidelines existed among healthcare workers. The physician knowledge was significantly lower than the nursing staff and surgeons, which demonstrates the need for improvement and highlights a major barrier in MRSA prevention (Brady et al., 2009).

Easton et al. (2007) reported a considerable variation of responses between doctors and nurses; most doctors identified *S. aureus* as a gram-positive organism while nurses were more likely to identify local infection control measures. In comparison, Fadeyi et al. (2011) also reported low MRSA awareness and knowledge among healthcare workers in critical care units but with no distinction between doctors and nurses. Therefore, their findings suggest the need for more educational programs and interventions on MRSA among all healthcare professionals. However, in this study, MRSA awareness correlated with age, number of years in service, and number of years in critical care and their work situation, indicating length of service and part-time versus full-time affected awareness of MRSA.

Brinsley-Rainisch, Cochran, and Pearson (2008) conducted three focus groups of dermatologists to assess their perceptions of CA-MRSA in their practice. Dermatologists are among the clinicians with the most frequent encounters of patients with CA-MRSA.

All participants identified MRSA as a national problem, but only half-perceived MRSA as a problem in their practice. In contrast, the UK National Health Service clinicians and patients/visitors viewed similar perceptions of MRSA as a risk to them (Gill, Kumar, & Wiskin, 2005). The most common resource for MRSA information was the general media, with nursing having the highest general media source. The dermatologists reported their greatest resources for MRSA information were medical journals, grand rounds, and/or meetings (Brinsley et al., 2008).

Healthcare professionals' level of knowledge regarding MRSA is an important tool in MRSA prevention. Prevention methods were identified with patient isolation, wound management, hand washing, adequate hygiene, treatment, regular screenings of staff, active surveillance, and health education as effective interventions in preventing the spread of MRSA (Fadeyi et al., 2011; Gill et al., 2005).

It is critical to have prevention and controls measures within correctional settings. In a survey, Webb and Czachor (2009) examined MRSA prevention and control activities of correctional facilities in the Greater Dayton area. In examining the correctional facilities, the administrators reported a 100% compliance on staff performing an interview and physical examinations on inmates who complain of a skin lesion, but only 50% reported a physical examination on inmates exposed to MRSA infected individuals (Webb & Czachor, 2009). Isolating infected inmates as an intervention scored low among the administrators, which raises concerns regarding close contact contamination. Other responses included 100% compliance with access to hand washing sinks and antibiotic use against active MRSA. Webb and Czachor (2009) concluded that more emphasis is

needed on MRSA awareness, prevention, treatment, and containment. Healthcare professionals must be trained and retrained on infection control techniques to increase their knowledge about MRSA interventions (Fadeyi et al., 2011).

### **Literature Summary**

The literature review examined the impact of MRSA in correctional settings and identified the correctional setting as one of the key contributors to MRSA outbreaks. To understand better the emergence of MRSA within this setting, the review examined risk factors and preventive measures. It discovered that although treatment and preventive guidelines were in place, health professionals did not adhere to practice guidelines (Brady et al., 2009). In addition, their poor knowledge levels and health beliefs about MRSA positively correlated with the healthcare professionals' practices and compliance with practice guidelines (da Silva et al., 2010). These findings lead to the conclusion that preventive measures alone were not efficient enough to control and prevent MRSA in correctional settings. More research efforts should focus on healthcare professionals' awareness, knowledge, and health beliefs about MRSA since they are key players in the prevention and control of MRSA.

### **Theoretical Framework**

#### **HBM**

The main objective of this study was to examine the knowledge and health beliefs of nursing professionals regarding MRSA, currently practicing in the correctional setting. While various literature provides some information regarding healthcare professionals' level of knowledge and health beliefs about MRSA in various settings, no studies have

examined the health beliefs of nursing professionals in correctional settings. The framework of this study, the HBM, allows focus on improving public health by examining nursing professionals' perceptions of MRSA. The HBM will help provide insight into problems in current practice, identify recommendations, reduce practice barriers, and identify educational needs of the nursing professionals.

The development of the HBM was to improve public health by understanding why people did and did not adhere to preventive health measures (Carpenter, 2010). The investigators from the Public Health Service developed this model to understand why individuals failed to use preventive services (Rosenstock, 1974). According to Rosenstock et al. (1988), who compared social learning theory and the HBM in explaining human behavior, the HBM hypothesized that health action depended on three factors:

1. The existence of sufficient motivation (or health concern) to make health issues salient or relevant.
2. The belief that one is susceptible (vulnerable) to a serious health problem or to the sequelae of the illness or condition. This is often termed *perceived threat*.
3. The belief that following a particular health recommendation would be beneficial in reducing the perceived threat, and at a subjectively acceptable cost. Cost refers to perceived barriers that must be overcome to follow the health recommendations. (p. 177)

The first factor of the HBM relates to how strongly individuals feel they are susceptible to a particular illness or negative health outcome. It is important to establish



healthcare professionals' perceived susceptibility or risk because if they believe that a negative health outcome will not influence their life, they will not be motivated to make changes (Carpenter, 2010). The second factor relates to an individual's perceived severity. This is strongly correlated with susceptibility because if one feels that the illness is not severe enough to impact one's life, there will be no motivation to avoid it. This degree of severity can be judged by the degree of an individual's emotions regarding the thought of a disease and by the difficulties the individual believes the disease may cause (Rosenstock, 1974).

The third factor focuses on the perceived benefits. This factor highlights the need for preventive measures. If healthcare professionals perceive no benefit to preventive measures, they are less likely to comply with infection control guidelines. Alternatively, if an individual believes a preventive measure is beneficial in reducing one's susceptibility to or severity of an illness, the individual is more likely to take action (Rosenstock, 1974). The fourth factor relates to perceived barriers. If barriers are identified in adopting preventive measures, then healthcare professionals are less likely to adhere to infection control practices. According to Rosenstock (1974), if readiness to act is high and the negative aspects of a health action are low, the action in question is more likely to be taken; however, if the readiness to take action is low and the negative aspects are high, this presents a barrier to taking action.

Other variables to the HBM model have been identified as cues to action and self-efficacy. Cues to action identifies one's readiness to change with the assistance of an additional element, such as advice from others, media campaigns, or reminder cards.

These cues to action could also be an internal element, such as negative change or perception in bodily state (Rosenstock, 1974). This factor of the HBM is the most underdeveloped and rarely measured element in the literature (Carpenter, 2010; McEwen & Wills, 2011). This factor was used to determine what healthcare professionals consider being their most trusted source for health information and their preferred method for receiving this information. The required intensity of cues to actions to trigger a change varies with an individual's perceived susceptibility and severity (Rosenstock, 1974).

Initially, the HBM ignored the influences of self-efficacy in influencing health behavior change (Rosenstock et al., 1988). When the HBM was first developed, the focus was more on accepting simple behavior health changes such as immunizations. Now, however, a vast majority of health behavior changes require individuals to make long-term changes that perhaps modify their lifestyle (Rosenstock et al., 1988). Self-efficacy identifies an individual's belief in their ability to perform a healthy action. If healthcare professionals have identified influences that motivate them to pursue healthy behaviors, then they are also most likely to adhere to preventive measures. For individuals to implement change, they must feel competent.

### Section 3: Methodology

In this section of the paper, I will discuss the project design, population, sampling methods, data collection, and analysis. The purpose of this study was to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in correctional settings. A descriptive design was used to answer the research questions presented in the study. The study's sample was composed of licensed practical nurses (LPN), registered nurses (RN), and nurse practitioners (NP). In addition, I developed a self-reported online survey questionnaire to determine the nurse professionals' level of knowledge and health beliefs regarding MRSA. Resources for the instrument were gathered from FBOP (2012) practice guidelines and the dimensions from the HBM (Rosenstock, 1974).

#### **Research Design**

The study focused on three research questions:

1. Among correctional health nurses, will the assessment of their health beliefs regarding prevention strategies, infection control resources, and their perceived risk and severity regarding MRSA provide interventions targeted to improve adherence to infection control practices?
2. What are the correctional nurses' level of knowledge regarding the prevention and the risk and severity of MRSA?
3. What are the identified barriers of the correctional nurses in maintaining compliance with MRSA infection control practices?

In this study, I used a quantitative descriptive study design to assess correctional nursing professionals' self-reported level of knowledge and perceptions of MRSA to gain further insight in an area where little research had been conducted in this setting. According to Burns and Grove (2009), "this design is useful in identifying problems with current practice, making judgments, developing theories, or justifying current practice" (p. 237). I used this design to gather an overview of the nurses' level of knowledge and health beliefs without affecting them in any way. The quantitative method was adopted to assess nurse professionals' level of knowledge and health beliefs from two studies that also used this design to assess nurses' health beliefs regarding MRSA prevention (da Silva et al., 2010; Wolf et al., 2008).

When using a quantitative design, researchers gather data with an objective approach without becoming emotionally involved. Researchers then analyze statistics, present logical outcomes, and are able to identify potential risks to research participants early in the project (Terry, 2012). In comparison with a qualitative design, quantitative designs have some disadvantages; they lack human interactions, emotions, and perceptions that may be helpful in answering research questions with a greater level of understanding (Terry, 2012).

### **Population and Sampling**

For participants, I chose LPNs, RNs, and NPs currently employed in a U.S. correctional facility, with full- or part-time employment, over the age of 18, and those able to read and understand English. Those excluded from the study included correctional support staff, correctional officers, healthcare staff with no direct patient care, anyone

under the age of 18, and those who were employed in a non-U.S. correctional facility. According to Terry (2012), “purposive sampling is used when the researcher specifies the characteristics of the population of interest and then locates individuals who match these characteristics” (p. 122). Although the purposive sampling was the best sampling method for this study, some have criticized the method for its difficulty in evaluating the researcher’s judgment in sampling selection (Burns & Grove, 2009). Therefore, the researcher must indicate the characteristics and the rationale of participant selection for the study (Burns & Grove, 2009).

The sample for this study was located through social media on LinkedIn. I obtained permission from the correctional nursing group administrator to join the group and post the invitation, which included a web link to the survey. A purposive sample of 36 correctional nurses who met the inclusion criteria agreed to participate. This sample included seven LPNs, 17 RNs, and 12 NPs. I did not seek to determine a sample size for this study because this was a descriptive study and I did not intend to generalize these results to a larger population. According to Burns and Grove (2009), “descriptive studies tend to have smaller samples because groups are not compared and generalization has very little relevance to the study” (p. 359). Burns and Grove (2009) also acknowledged that small sample sizes were more beneficial to the researcher due to the interest of examining a situation in depth from different perspectives.

## **Data Collection**

### **Institutional Review Board (IRB)**

Before the initiation of data collection for this study, I sought the approval from Walden University IRB. The IRB application was initially submitted on July 21, 2014 and a conditional approval was received pending site approval on August 4, 2014. Unfortunately, because I was conducting research in a federal institution, programmatic stipulations blocked my site approval. A request for a change in procedures form was resubmitted to the Walden University IRB on September 14, 2014 and was approved on September 19, 2014. No data collection was performed or participant recruitment before notification of approval to conduct research was received. The IRB approval number is 08-04-14-0058336 and expires on August 3, 2015.

### **Protection of Human Subjects**

I obtained the NIH ethical training certificate (Appendix A). Upon receiving IRB approval from Walden University, I posted an invitation on the social media LinkedIn group website, which included the inclusion criteria and a web link to the survey (Appendix B). The invitation also stated that any participation was strictly voluntary. Once the potential participants clicked on the web link, they were brought to an informed consent page that described (a) who I was and my contact information, (b) why I was doing the research, (c) the purpose of the study, (c) what was expected of the participant, (d) time requirements, (e) payments or gifts, (f) risk and benefits, (g) voluntary participation, (h) confidentiality, and (i) the contact information for my chair and the Walden University representative (Appendix C). If they were willing to participate they

had to click on the box “Yes, I agree to participate” and if not they clicked on the box “No, I do not agree to participate.” They had to answer this required question before proceeding. The participants who agreed were taken to the survey and those who did not agree were taken to a thank you page. The web link remained active for 3 weeks beginning from the initial web invitation.

I delivered the survey questionnaire using SurveyMonkey software and questionnaire tool. SurveyMonkey’s secure password-protected website was used to create, disseminate, and analyze survey results through an online interface. The survey responses were limited to one response per computer, the participants were able to edit their responses until the last page of the survey was completed, and participants in the survey remained anonymous with no IP addresses stored. I was the only person able to access the data, which was transcribed onto an Excel spreadsheet and entered into SPSS. This information was kept on a password-protected computer and a USB password-protected device for backup. This information will be held in my possession for 5 years and then destroyed.

### **Knowledge and Health Beliefs Regarding MRSA Questionnaire**

To assess the nurse professionals’ level of knowledge and health beliefs, I created an original survey instrument. All participants who agreed to participate in the study received the survey instrument, entitled Knowledge and Health Beliefs Regarding MRSA Questionnaire. The participants received instructions on how to complete the survey. The instrument (Appendix D) contained open- and closed-ended questions. The first question was the statement of consent, for which each participant had the option to agree to

participate or disagree to participate. Questions 2 through 9 were all sociodemographic questions to gain an understanding of who was participating in the survey. These questions obtained information about their profession, gender, age, ethnicity, U.S. correctional facility in which they were employed, number of years in their profession, number of years in corrections, and their employment status. Questions 10 through 19 tested the nurse professionals' level of knowledge regarding MRSA, which included questions pertaining to (a) epidemiology, (b) risk factors, (c) clinical presentation, (d) screening method, (e) transmission, (f) diagnosis and treatment (g), infection control measures, and (h) prevention. These questions consisted of multiple choices and *true/false* answers. Questions 20 through 29 assessed the nurses' health beliefs regarding MRSA. A 5-point Likert-type scale (1= *strongly disagree*; 5= *strongly agree*) was used for questions 20 through 26. Questions 27 and 28 were multiple choice with the option for the participant to comment with his or her own responses. These open-ended items contextualized the overall results and elicited additional feedback. Question 29 was also developed on a 5-point Likert-type scale (1= *not confident at all* and 5= *very confident*). The questions were gathered from the FBOP's (2012) MRSA practice guidelines and from the HBM.

## **Data Analysis**

### **Content Validity**

In designing an original instrument, the researcher must take multiple steps in ensuring validity and estimating reliability (Burns & Grove, 2009). The validity of an instrument ensures that the instrument measures what it actually intends to measure



(Terry, 2012). In this study, content validity was used to determine the relevance and clarity of each item and if the entire instrument adequately represented the concepts (level of knowledge and health beliefs) being measured. Lynn (1986) suggested that, during the judgment-quantification stage of content validation, a two-step process should ensure all items and the entire instrument are content valid. Researchers have debated the number of experts needed to evaluate representativeness and clarity (Beck & Gable, 2001; Lynn, 1986; & Rubio, Berg-Weger, Tebb, Lee, & Rauch, 2003). For the purpose of this study, 10 professional experts with extensive knowledge on publication, clinical research, and the content being measured were asked to give valuable feedback on the study instrument.

After identifying the expert panel, an email invitation was sent consisting of a consent form identifying the purpose of the study, the reason why the expert was chosen, a description of each item expected to measure the concepts, how each item would be scored, and instructions on how to complete the content validity instrument (Appendix E). Each potential member received 2 weeks to complete the instrument for content validity. A content validity index determined the content validity of individual items (I-CVI) and the overall scale /subscales (S-CVI) (Lynn, 1986).

Of the 10 experts, six completed the survey in its entirety. Two experts did not complete the survey and two did not respond to the survey. I excluded these four experts from the expert panel. The experts who participated were all female and in the nursing profession. Of the six expert professionals, five had doctoral degrees, more than 20 years in their profession, and had published their research. The one expert panel with the

highest degree of a master's, no published research, and between 10-15 years in her profession was chosen due to her extensive knowledge in correctional healthcare. Table 1 shows the expert panels' demographics.

Table 1

*Demographics of the Expert Panel*

Characteristics	N (%)
Age	
45-54	4 (67)
55-64	2 (33)
Profession	
Nursing	6 (100)
Specialty	
Public health	1 (17)
Nurse Practitioner	3 (50)
Maternity	1 (17)
Informatics	1 (17)
Gender	
Female	6 (100)
Male	0
Number of years in profession	
10-15	1 (17)
>20	5 (83)
Highest degree completed	
Masters'	1 (17)
Doctoral	5 (83)
Published research	
Yes	5 (83)
No	1(17)

*Note.* N= number of expert panel participants.

The expert panel was asked to rate the content relevance of each item by using a 4-point ordinal rating scale from 1= *not relevant* to 4= *highly relevant*. The clarity of each item was also rated by using the 4-point scale from 1= *not clear* to 4= *clear*. In addition to rating the relevance and clarity of each item, the expert panel was asked to comment on the items or to suggest revisions. The I-CVI for relevance and clarity was determined by the proportion of experts who rated the items as 3 or 4 (Beck & Gable, 2001; Lynn, 1986; Rubio et al., 2003). The content validity of each item was determined

valid if the I-CVI score was no lower than 0.83 (Polit & Beck, 2006). According to Lynn (1986), when six or more experts are used, a disagreement between one or more can still be used to assess an instrument content valid. Table 2 shows the relevance I-CVI scores. The clarity I-CVI scores ranged from 0.83 to 1.00.

Table 2

*Expert Panels Items Scores on a 4-Point Relevance Scale*

Item	Experts						I-CVI
	1	2	3	4	5	6	
1	4	4	3	4	4	4	1.00
2	4	3	3	4	4	4	1.00
3	4	2	3	3	4	4	0.83
4	4	4	4	3	4	4	1.00
5	4	4	4	4	4	4	1.00
6	4	4	3	4	4	4	1.00
7	4	4	4	4	4	4	1.00
8	4	4	4	4	4	4	1.00
9	4	4	3	1	3	4	0.83
10	4	4	3	4	4	4	1.00
11	4	4	3	4	4	4	1.00
12	4	4	4	4	4	4	1.00
13	4	4	4	4	4	4	1.00
14	4	4	3	4	4	4	1.00
15	4	4	4	3	3	4	1.00
16	4	4	3	1	4	4	0.83.
17	4	4	1	4	4	4	0.83
18	4	4	3	3	3	4	1.00
19	4	4	2	4	4	4	0.83
20	4	4	3	3	4	4	1.00

**S-CVI= 0.96**

*Note.* I-CVI, item-level content validity index; S-CVI, scale-level content validity index.

The total S-CVI score of 0.80 or higher determined the entire instrument valid (Polit & Beck, 2006). The S-CVI for the entire instrument was rated by the proportion of items deemed content valid by the experts (Lynn, 1986). The S-CVI score for this survey instrument was 0.96. One item from the questionnaire was revised from “the most common lesion of CA-MRSA” to “the most common clinical presentation of CA-MRSA.” This item had an I-CVI score of 0.83 but many of the expert panel members stated it needed minor alterations and one expert stated this item was not clear.

### **Reliability**

Reliability in research refers to the consistency of an instrument to produce the same responses if the instrument was administered to the same individuals at two different times (Burns & Grove, 2009). It is important to provide an instrument that is reliable and with only a small amount of random error. One way to determine reliability of a particular instrument is through internal consistency reliability.

Internal consistency reliability relates to all items in an instrument to consistently measure the construct (Burns & Grove, 2009). The statistical procedure used to measure internal consistency was the Cronbach’s  $\alpha$ . Cronbach’s  $\alpha$  is useful in determining reliability in survey tools using the Likert scale for interval or ratio level data (Burns & Grove, 2009; Terry, 2012). The normal range values of the Cronbach’s  $\alpha$  falls between .00 and +1.00. The higher the value, the better the reliability and the lower the value, the more likely the instrument may be unreliable. The coefficients values between 0.70 and 0.75 are assumed adequate but coefficient values of 0.80 or higher are highly desirable in determining the instrument’s quality and reliability (Polit, 2010). The Cronbach’s  $\alpha$  value

was 0.67 on the Likert scale responses regarding the nurse professionals' health beliefs. This value excluded one item on self-efficacy because it lowered the Cronbach's  $\alpha$  value to 0.65.

### **Analytical Techniques**

This descriptive study used quantitative and qualitative analysis to answer the three research questions:

1. Among correctional health nurses, will the assessment of their health beliefs regarding prevention strategies, infection control resources, and their perceived risk and severity regarding MRSA provide interventions targeted to improve adherence to infection control practices?
2. What are the correctional nurses' level of knowledge regarding the prevention and the risk and severity of MRSA?
3. What are the identified barriers of the correctional nurses in maintaining compliance with MRSA infection control practices?

I transcribed all quantitative information regarding the nurse professionals' knowledge and perceptions of MRSA through descriptive statistics and inputted into a statistical software using SPSS. A statistical analysis was conducted by using the nonparametric chi-square test and Fisher's exact test to explore a relationship between the nurse professionals. Tables and graphs demonstrated statistical results. Demographic information was used to gather valuable information about the study participants including their profession, age, gender, number of years in their profession, and their number of years in the correctional setting.

Descriptive statistics provided summaries about the data collected from the closed-ended questions. A frequency distribution was developed for the survey responses received from the participants. I analyzed qualitative data from the two multiple-choice questions giving the participants an option to provide their own responses by using an open coding method. With this analysis, I was able to reflect on the key phrases from the participants' responses and then place them into themes/categories (Burns & Grove, 2009). These responses provided additional feedback.

### **Summary**

The purpose of this project was to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in correctional settings. I used a self-developed knowledge and health beliefs questionnaire to gather valuable information for gaining further insight in improving infection control programs. A descriptive design allowed the opportunity to assess these variables in an observational role that would be useful in gathering data for future research. The results of this study will help future nurse researchers develop programs and interventions that will improve infection control practices, infection control compliance, and MRSA infection rates in correctional settings. It will also help determine educational and other activities that could improve healthcare professionals' compliance to infection control guidelines. By using the HBM and focusing on healthcare professionals' knowledge and perceptions of MRSA, this will lead to solutions that could break the chain of MRSA transmission in correctional settings.



## Section 4: Findings, Discussion, and Implications

### Summary of Findings

The purpose of this study was to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in correctional settings. Nurse professionals play a vital role in MRSA prevention; therefore, gaining insight into their knowledge and perceptions of MRSA could improve practice guideline adherence. I developed a survey to identify the nurse professionals' level of knowledge and health beliefs regarding MRSA. Descriptive analysis of the survey revealed the demographic information of the nurse professionals, their level of MRSA knowledge, and their health beliefs regarding MRSA. The statistical analysis used in this study was nonparametric chi-square and Fisher's exact test. Statistical analysis was performed using SPSS Statistics 21. The statistical significance was set at  $p < 0.05$ . Overall, the nurse professionals accurately identified greater than 70% of the correct responses in the knowledge portion of the survey with the exception of two questions. These two questions asked what was the most common method of MRSA transmission and if MRSA should be empirically treated within a known MRSA outbreak (56% and 64% respectively). The lack of training/education was the most reported barrier to MRSA prevention and in-services were the preferred method of receiving MRSA prevention educational information. For the purpose of data analysis, the nursing professionals were divided into two groups; RN/LPNs were separated from the NPs. RN/LPNs were significantly more likely to perceive MRSA as a risk to themselves as opposed to NPs. ( $p$

< 0.05). In the following section, I will discuss the findings of the study, the implications of the project findings, the strengths and limitations of the study, and my self-analysis.

## **Findings**

### **Study Population**

Eighty-four nurse professionals, RNs, LPNs, and NPs agreed to participate in the study and four did not agree to participate. Of the 84 who agreed to participate, 48 either did not respond to any questions or only responded to the demographic questions and did not attempt to answer the knowledge and/or health belief questions. These 48 were excluded from the analysis. In total, 36 nursing professionals were included in this study. Of these, 67% ( $n = 24$ ) were RN/LPNs and 33% ( $n = 12$ ) were NPs. Table 3 presents the nurse professionals' demographics. The majority of the nurse professionals were female (78%), a RN/LPN (67%), between the ages of 45-54 (42%), White/Caucasian (75%), with greater than 5 years in their profession and in the correctional field (69% and 56%), currently employed at a jail (53%), and employed full-time (78%).

Table 3

*Sample Characteristics (N = 36)*

Characteristic	Frequency	Percent
<b>Profession</b>		
RN/LPN	24	67
NP	12	33
<b>Gender</b>		
Female	28	78
Male	8	22
<b>Age</b>		
25-34	3	8
35-44	6	17
45-54	15	42
55-64	11	31
>65	1	3
<b>Ethnicity</b>		
American Indian or Alaskan Native	1	3
Asian or Pacific Islander	2	6
Black or African American	6	17
White/Caucasian	27	75
<b>Correctional Facility (Jail)</b>		
Yes	19	53
No	17	47
<b>Correctional Facility (Detention Center)</b>		
Yes	10	28
No	26	72
<b>Correctional Facility (Prison)</b>		
Yes	16	44
No	20	56
<b>Years in their Profession</b>		
Less than or equal to 5	11	31
Greater than 5	25	69
<b>Years in the Correctional Field</b>		
Less than or equal to 5	16	44
Greater than 5	20	56
<b>Employment Status</b>		
Full-time	28	78
Part-time	8	22

*Note.* N=total number of participants.

### **Nurse Professionals' Knowledge Regarding MRSA**

Although there were considerable variations in correct responses among the RN/LPNs and NPs, no significant differences were found between the two groups after using the alternative test known as Fisher's exact test (Table 4). This test determined if the two variables (profession and correct responses) were independent or related. The Fisher's exact test replaces the chi-square test when the expected frequencies in a 2x2 table are less than five (Field, 2009; Polit, 2010).

Table 4

*Summary of Correct Questionnaire Responses from Nursing Professionals Regarding**MRSA*

Question	Total N(%)	RN/LPN N(%)	NP N(%)
Staph bacteria found on the skin and in the nose of healthy persons that are sensitive to beta-lactam antibiotics	33(92)	21(88)	12(100)
These risk factors increase suspicion of MRSA infection except	27(75)	20(83)	7(58)
The most common clinical presentation of CA-MRSA are	26(72)	16(67)	10(83)
Only inmates during the intake medical screening and physical examination with diabetes, immunocompromised, open wounds, recent surgery, and chronic skin conditions should be carefully evaluated for skin infections	31(86)	21(88)	10(83)
The most common method of MRSA transmission is through	20(56)	14(58)	6(50)
The diagnosis of probable MRSA should not be made empirically when inmates present with a skin and soft tissue infection (SSTI) within a known MRSA outbreak	23(64)	16(67)	7(58)
Hand washing before and after every patient contact whether or not gloves are worn is the simplest and most important infection control measure for preventing and containing MRSA infections	35(97)	23(100)	12(100)
Single cell housing is recommended if:	27(75)	17(71)	10(83)
Antibiotic therapy that are used to treat presumed or confirmed MRSA infections should be directly observed via pill line	26(72)	16(67)	10(83)
Untreated MRSA infections do not result into life threatening infections	33(92)	22(92)	11(92)

*Note.* N= number of responses. % = percent of total responses correct.

The majority of the participants (92%) correctly identified MRSA as resistant to beta-lactam antibiotics. RN/LPNs were 88% ( $n = 21$ ) correct compared to NPs, who were 100% ( $n = 12$ ) in correctly responding to this question. Eighty-three percent ( $n = 20$ ) of RN/LPNs compared to 58% ( $n = 7$ ) of NPs identified the exception in identifying risk factors that increase suspicion of MRSA. There was no significant difference between the RN/LPNs and NPs identifying the correct risk factors that increase suspicion of MRSA ( $p = 0.126$ ).

The most common clinical presentation of CA-MRSA was correctly identified by 72% of RN/LPNs and NPs ( $n = 16$  and  $n = 10$ , respectively). Although NPs were more likely to answer correctly the most common clinical presentation compared to RN/LPNs (83% vs. 67%), the difference was not significant ( $p = 0.438$ ). The *true/false* question regarding intake screening for skin infections was correctly answered by 86% ( $n = 31$ ) of the respondents. Of the 86% who answered correctly, more RN/LPNs responded correctly when compared to NPs (88% vs. 83%).

Fewer participants (56%) responded correctly to the most common method of MRSA transmission. Question 15 stated that the diagnosis of probable MRSA should not be made empirically when inmates present with a SSTI within a known MRSA outbreak. Sixty-four percent responded correctly by identifying this question as a *false* statement. Regarding the probable diagnosis of MRSA being treated empirically, only 64% ( $n = 23$ ) of the participants responded correctly. All participants accurately identified hand washing as the simplest and most important infection control measure for preventing and containing MRSA infections, except for one participant who did not answer.

Eighty-three percent ( $n = 10$ ) of NPs correctly responded to single-cell housing recommendations, compared to 71% ( $n = 17$ ) of RN/LPNs who responded correctly. Seventy-two percent ( $n = 26$ ) of RN/LPNs and NPs correctly answered that antibiotic therapy used to treat presumed or confirmed MRSA infection should be directly observed via pill line. The majority of the participants (92%) correctly identified MRSA as a life-threatening infection.

### **Nurse Professionals' Health Beliefs Regarding MRSA**

Questions 20-26 asked the nurse professionals to rank their health beliefs regarding MRSA by using a 5-point Likert scale from 1= *strongly disagree* to 5= *strongly agree*. The median score results were 4.0 and 5.0 and a *SD* range from 0.557-1.155. After reducing the Likert scale responses to the nominal level by combining all agree and disagree responses, I performed a Fisher's exact test. RN/LPNs were significantly more likely than NPs to perceive MRSA as a risk to themselves (87%) ( $p < 0.05$ ). However, RN/LPNs felt less likely that they were at a greater risk of acquiring MRSA while caring for infected inmates/detainees (55%) compared to NPs (82%) ( $p = 0.410$ ). The descriptive statistics provided a comparison of the participants' responses shown in Table 5. There were no other statistically significant findings between the RN/LPNs and NPs health beliefs.

Table 5

*Number (Percentage) of Responses from Nurse Professionals Regarding Their MRSA**Health Beliefs*

Question	Strongly Disagree N(%)	Disagree N(%)	Neutral N(%)	Agree N(%)	Strongly Agree N(%)
Do you feel that MRSA can pose a risk to yourself					
RN/LPNs	0	3(13)	0	18(78)	2(9)
NPs	0	1(9)	2(18)	3(27)	5(46)
Do you feel that you are at a greater risk of acquiring MRSA while caring for an infected inmate/detainee					
RN/LPNs	0	3(13)	6(26)	12(52)	2(3)
NPs	0	0	2(18)	6(55)	3(27)
Do you feel that MRSA is a problem at your correctional facility					
RN/LPNs	0	6(26)	6(26)	5(22)	6(26)
NPs	0	2(18)	1(9)	4(36)	4(36)
Do you feel that hand washing frequency should be greater while delivering care to detainees with MRSA					
RN/LPNs	0	4(17)	2(9)	10(44)	7(30)
NPs	0	0	2(18)	2(18)	7(64)
Do you feel that MRSA can cause a severe infection					
RN/LPNs	0	0	1(4)	7(30)	15(16)
NPs	0	1(9)	0	2(18)	8(73)
Do you feel that infection control practices help reduce the prevalence of MRSA					
RN/LPNs	0	1(5)	1(5)	6(27)	14(64)
NPs	0	0	0	4(36)	7(64)
Do you feel that hand washing is the most influential aspect in infection control					
RN/LPNs	0	0	1(4)	9(39)	13(14)
NPs	0	0	0	3(27)	8(73)

*Note.* N= number of responses. %= percent of total responses.



**Barriers to MRSA prevention in the correctional setting.** In question 27, the participants were asked to identify barriers to MRSA prevention in the correctional setting. They were given the following choices: (a) absence of supplies (gloves, PPE), (b) lack of testing for MRSA, (c) lack of training/education, (d) lack of teamwork, (e) decreased number of staff on duty, and (f) other. The participants could choose more than one response and comment in their own words regarding a barrier to MRSA prevention that was not included in the choices. I analyzed the barriers that were described in the participants' own words using open coding. According to Burns and Grove (2009), coding is a method of categorizing data. The codes summarized what the participants identified as barriers.

The most frequently reported barrier by both RN/LPNs and NPs was the lack of training/education (73% and 70% respectively). One participant commented on their identified barrier as, "lack of training in proper cleaning of exam rooms and quarters." I coded this response under lack of training/education. Another participant commented that access to running water was also a barrier. This comment was coded under lack of supplies. The least reported barriers expressed in their own words by RN/LPNs were the lack of time (5%) and the lack of space (5%). Although no significant differences between the barriers to MRSA prevention identified by the nurse professionals, RN/LPNs identified more barriers to MRSA prevention compared to NPs (Table 6).

Table 6

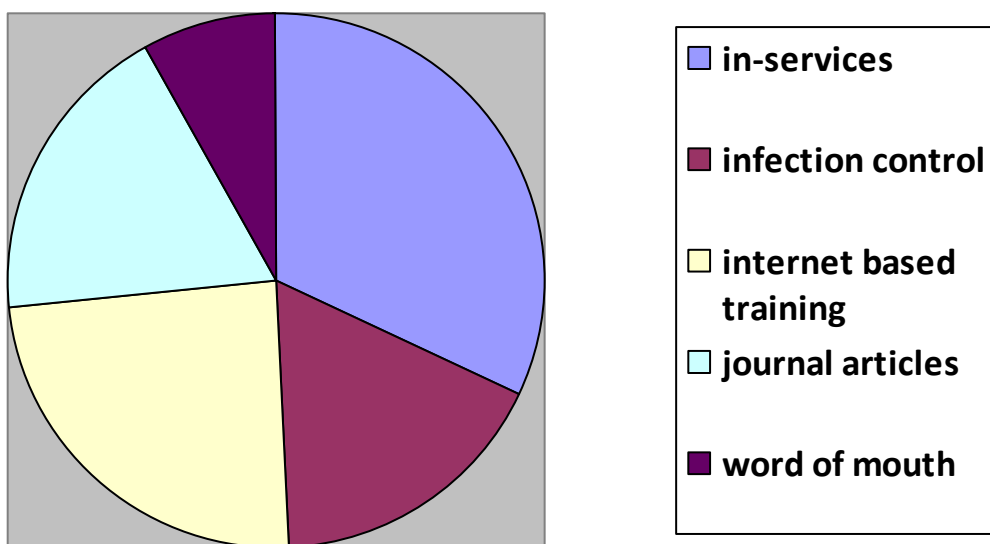
*RN/LPNs and NPs Identified Barriers to MRSA Prevention in the Correctional Setting*

Barriers	Yes N(%)	No N(%)
Absence of supplies (gloves, PPE)		
RN/LPNs	7(32)	15(68)
NPs	1(10)	9(90)
Lack of testing for MRSA		
RN/LPNs	10(45)	12(55)
NPs	2(20)	8(80)
Lack of training/education		
RN/LPNs	16(73)	6(27)
NPs	7(70)	3(30)
Lack of teamwork		
RN/LPNs	8(36)	14(64)
NPs	1(10)	9(90)
Decrease number of staff on duty		
RN/LPNs	10(45)	12(55)
NPs	4(40)	6(60)
Lack of space		
RN/LPNs	1(5)	21(96)
NPs	0	10(100)
Lack of time		
RN/LPNs	1(5)	21(96)
NPs	0	10(100)

*Note.* N= total of responses. % = percent of the total responses.

**Method for educational information on infection control.** The participants were asked in question 28 to identify their preferred method for receiving educational information on infection control (Figure 2). The choices given to the participants included (a) in-services, (b), infection control officer, (c) Internet-based training, (d) journal articles, (e) word of mouth, and (f) other. The participants had the option to choose more than one answer. Only one participant commented on their preferred

method. The comment given was a “lunch and learn program.” I coded this response under in-services.



*Figure 2.* Preferred method of receiving educational information.

Table 7 shows the most preferred method by the nurse professionals (67%) for receiving infection control information was in-services. The least preferred method by the nurse professionals was word of mouth (17%). However, NPs (73%) also indicated Internet-based training as a preferred method of receiving infection control information. While RN/LPNs also preferred receiving infection control information from the infection control officer (50%) ( $p = 0.132$ ), no significant differences existed between the RN/LPNs' and NPs' preferred method of receiving MRSA infection control information. However, female nurse professionals (56%) were significantly more likely to identify journal articles as their preferred method of receiving infection control education when compared to male nurse professionals ( $\chi^2 = 7.781$ ,  $df = 1$ ,  $p = 0.005$ ).

Table 7

*Preferred Method for Receiving Educational Information on Infection Control Practices and MRSA Prevention*

Preferred Method	Total <i>N</i> (%)	RN/LPNs <i>N</i> (%)	NPs <i>N</i> (%)
In-services	24(67)	16(73)	8(73)
Infection control officer	13(36)	11(50)	2(18)
Internet based training	18(50)	10(46)	8(73)
Journal articles	14(39)	8(36)	6(55)
Word of mouth	6(17)	4(18)	2(18)

*Note.* *N* = number of *yes* responses. % = percent of *yes* responses.

**Confidence in taking preventive action.** Question 29 asked each participant to rate their confidence level in taking preventive actions to prevent and control MRSA transmission in their facility. The nurse professionals' median score result was 5.0 and *SD* = 14.252 on a scale of 1 = *not at all confident* to 5 = *confident*. Overall, the nurse professionals reported being somewhat confident and confident in taking preventive actions to prevent and control MRSA transmission in their facility (78%). Although no significant difference existed in the RN/LPNs' and NPs' confidence in taking preventive action, RN/LPNs were more confident when compared to the NPs (80% vs. 75%). However, 13% (*n* = 3) of RN/LPNs were not at all confident to take preventive action compared to 8% (*n* = 1) of NPs (Table 8).

Table 8

*Confidence Taking Preventive Action*

Profession	Not at all confident <i>N</i> (%)	Not very confident <i>N</i> (%)	Neutral <i>N</i> (%)	Somewhat Confident <i>N</i> (%)	Confident <i>N</i> (%)
RN/LPNs	3(13)	0	0	9(38)	10(42)
NPs	1(8)	0	1(8)	1(8)	8(67)

*Note.* *N*= number of responses. %= percent of total responses.

## Discussion

### MRSA Knowledge

This study demonstrates a considerable amount of knowledge among the RN/LPNs and NPs with a total knowledge percentage of greater than 70% concerning the epidemiology, risk factors, clinical presentation, screening, prevention, and treatment of MRSA. However, there was an overall lack of knowledge concerning the method of transmission and diagnosis of MRSA among the RN/LPNs and NPs, which could explain some noncompliance with practice guidelines if nursing professionals are not able to diagnosis MRSA correctly or do not know how MRSA is transmitted. Although, there were some differences among the nurse professionals' level of knowledge regarding MRSA, there is clearly evidence that supports the need for an overall knowledge improvement.

The RN/LPNs were more knowledgeable about the risk factors of MRSA whereas the NPs demonstrated a higher awareness in the clinical presentation, prevention, and treatment of MRSA. Considering these results, there is a need for more educational interventions in improving nurse professionals' adherence to practice guidelines. This

need for more educational interventions were also found in the literature among clinicians involved in the care of MRSA infected patients (Brady et al., 2009; Easton et al., 2007; Fadeyi et al., 2011; Stein et al., 2003). To improve infection control practices, improving clinicians' level of knowledge about MRSA must become a priority (Easton et al., 2007). Nevertheless, according to this study, the importance of hand washing appears to be effectively taught in the education into the practices of all nursing professionals.

While nursing professionals' level of knowledge is important in the adherence of practice guidelines, perceptions influence health behavior. In planning programs, many educators have used the HBM to assess the needs of the target population, understand risk behaviors, and develop strategies for disease prevention (Rosenstock et al., 1988; da Silva et al., 2010). In this study, I developed a survey that assessed the health beliefs of nursing professionals in the correctional setting regarding MRSA using the HBM. The HBM variables examined the individual's perceived susceptibility, perceived severity, perceived benefits of taking action, perceived barriers to taking action, cues to action, and self-efficacy.

### **Perception of Susceptibility and Severity**

The perception of susceptibility refers to the subjective risk of contracting a condition (Rosenstock, 1974)). In this dimension of the HBM, study participants were asked if MRSA could pose a risk to themselves. Most participants perceived MRSA as a personal risk (77%). As well, 64% ( $n = 23$ ) also perceived themselves at a greater risk of acquiring MRSA while caring for an infected inmate/detainee. In the HBM, an individual's perception is a predictor of their health behavior (Brinsley et al., 2005).

Since the participants perceived MRSA to be a risk to self and an even greater risk while caring for an infected inmate/detainee, they would be more likely to adopt preventive behaviors. The remaining participants believed there were no risk or were indecisive and would therefore be less likely to adopt these changes, suggesting the need for the development of preventive behaviors. Other studies in the literature also concluded that if one perceived a susceptibility to a disease, they were more likely to participate in a preventive behavior (Brinsley et al., 2005; Lee, Kim, & Han, 2009; da Silva et al., 2010; Wolf et al., 2008).

Twenty- two percent ( $n = 8$ ) of nurse professionals believed MRSA was not a problem at their correctional facility. This result suggests there may be a need for improvements in understanding the risk of MRSA in the participant's correctional facility. According to the HBM, an individual who does not perceive themselves to be susceptible to harm will not act to prevent a negative health outcome (Carpenter, 2010). This is an unfortunate circumstance because the correctional setting has an increasing prevalence of MRSA (Malcolm, 2011).

Another dimension of the HBM is the perception of severity, which predicts that if an individual perceives the severity of a negative outcome as a more complex health problem that could affect their job, family life, and social relations, they would be motivated to avoid such an outcome (Rosenstock, 1974). Seventy-two percent ( $n = 26$ ) agreed that hand-washing frequency should be greater while delivering care to infected detainees and 89% ( $n = 32$ ) believed that MRSA could cause a severe infection. The increased awareness that MRSA could lead to negative outcomes suggests that the

participant's knowledge of MRSA risk is understood. The perceived susceptibility and severity have a strong correlation to an individual's knowledge of a health problem (Rosenstock, 1974). As in the study regarding Korean immigrants' acceptance of mammography, those with perceived susceptibility and severity of breast cancer were more likely to participate in mammography screening (Lee et al., 2009).

### **Benefits and Barriers to Taking Action**

The perceived benefits of taking action relates to the effectiveness of a known action in reducing a negative health outcome (Rosenstock, 2005). A person's beliefs about the availability and effectiveness of an action will determine the course of the individual. In this study, 86% ( $n = 31$ ) of the participants reported that infection control practices could help reduce the prevalence of MRSA and 91% ( $n = 33$ ) believed that hand washing was the most influential aspect in infection control. The researchers evaluating factors related to nurses' adherence to preventive measures found that 94% believed that preventive measures could be beneficial (da Silva et al., 2010). This is an important factor in planning programs because if one believes a preventive measure would be beneficial it encourages prevention strategies.

An individual who believes an action is effective in reducing negative outcomes but at the same time sees that this action is inconvenient, expensive, painful, and/or challenging, their adoption of preventive measures will unlikely occur (Carpenter, 2010; Rosenstock, 1974). According to Rosenstock (1974), these negative aspects of an action serve as a barrier to action. If the benefits of taking action are high and the barriers are weak, the action is likely to happen; however, if the benefits of taking action are low and



the barriers are seen as strong, the action is likely not to happen (Rosenstock, 1974). The greatest barrier perceived by the participants in this study was the lack of training/education (64%).

The decreased number of staff on duty (39%) was the next most cited barrier to taking preventive action. A similar study also cited training, education, and adequate number of staff as barriers to preventive measures (da Silva et al., 2010). Other cited barriers included lack of testing, teamwork, and absence of supplies. Given the most frequently cited barrier of lack of training and education among the correctional nurse professionals, more emphasis on education would be an appropriate action in reducing the prevalence of MRSA. This suggests that the nurse professionals are not receiving adequate education about MRSA and this should serve as an important cue to action by creating a preferred method of receiving educational information.

### **Educational Cues to Action**

Cues to action are also a variable within the HBM that establishes an individuals' readiness to act. Ones' readiness to act is demonstrated by the combined levels of perceived susceptibility and severity of a negative outcome and perceived benefits (Rosenstock, 1974). In this study, the most preferred educational cues included in-services (67%) and Internet-based training (50%). Because the nurse professionals rely mostly on in-services and Internet-based training, having access to these educational opportunities would be beneficial. Suggestions include offering in-services multiple times throughout the year and making Internet-based training available to those who prefer this method.

However, there were differences among the nurse professionals in identifying their preferred educational cues. This would suggest a slightly more different educational approach when educating RN/LPNs versus NPs about MRSA infection control and prevention. A similar report also identified in-services as the most preferred educational cue as well as identifying differences in cues to action among health professionals (Wolf et al., 2008). The infection control officer ranked higher among RN/LPNs (50%) as the favored educational cue. Having access to an infection control officer would be a valuable and beneficial source in eliminating barriers to MRSA prevention. Since infection control officers are favored among RN/LPNs, they could serve by providing ongoing reinforcements of infection control strategies.

### **Contribution of Self-Efficacy**

Self-efficacy was an additional variable of the HBM that was added later by Rosenstock (McEwen & Wills, 2011). The earlier focus of the HBM was on simple preventive actions and it was believed that this target group had adequate self-efficacy regarding a recommended behavior and therefore it was not recognized (Rosenstock et al., 1988). Today, individuals are requiring long-term changes that involve modifying their lifestyles. To make a change in behavior, one must hold a certain level of confidence to make a change. In this study, the participants reported a 78% ( $n = 28$ ) confidence level in taking preventive actions to prevent and control MRSA transmission. This result suggests the nurse professionals felt themselves competent in taking preventive actions. According to the Rosenstock et al. (1988), self-efficacy has two

values in the HBM; it delimits the barriers and suggests new and more productive lines for research and practice.

## **Implications**

### **Policy**

The study results demonstrated a need for local policy changes within the correctional setting. The HBM permitted the identification of the most perceived barriers (lack of training/education) and the educational cues to action (in-services) on infection control practices and MRSA prevention. This suggested that correctional facilities do not have adequate requirements on MRSA training and education. To eliminate these barriers, administrators should assess the needs of the healthcare professionals and make adequate policy changes. This should be a priority within the correctional setting to ensure that all employees are educated on infection control and MRSA prevention and that nurse professionals are educated within their most preferred method. In addition, administrators should mandate more than one educational session on MRSA prevention and transmission throughout the year.

### **Practice**

Correctional administrators must assess their staff's educational needs to strengthen infection control programs. In practice, nurse professionals are at the frontlines of infection control and prevention. The one dimension of the HBM that must be present, even if there perception of susceptibility or severity is high, is self-efficacy. In this study, the participants expressed a high percentage of confidence to take on preventive actions. It is recommended that correctional infection control programs give

the professionals the education and skills needed to gain confidence in taking on the complexity of a health problem. Giblin et al. (2004) suggested that clinicians be offered an array of educational methods such as presentations, continuing education credit, and constant reminders such as posters to increase adherence to guidelines.

### **Research**

This study has given nurse researchers a platform to build on to prevent the spread of MRSA within the correctional system. It is important for future researchers to assess the threat of MRSA within their facility. If nurse professionals are not aware of the true threat of MRSA, this could affect their perception of susceptibility. According to the HBM, nurses may not act to prevent a negative outcome if they believe they are not likely to be impacted by it (Carpenter, 2010). Future studies should also consider the educational needs of the professionals. In planning educational programs, administrators and health educators must tailor these educational trainings to facilitate effective infection control practices and preventive strategies. Another suggestion for future research is to assess strategies capable of catalyzing health behavior changes that will encourage the adoption of preventive strategies and adherence to practice guidelines. In view of the importance of individual health beliefs in improving the adoption of preventive measures, a qualitative study would be beneficial in assessing the health beliefs of the nurse professionals to gain a subjective description of their perceptions of MRSA (Terry, 2012).

## **Social Change**

Nurse professionals are on the frontlines of MRSA prevention; however, in order to adequately control and prevent MRSA, they must first be given the skills and education. Based on the results of this study, nurse professionals do not feel they have adequate training and education regarding MRSA prevention and control. This is an unfortunate circumstance because the correctional system may be a key reservoir of MRSA entry into the greater community when inmates are released (Malcolm, 2011). Previous investigators studied the outbreaks of MRSA within the correctional system and discovered a high prevalence of MRSA infection and colonization (CDC, 2003). To change the outcome of an increasing prevalence of MRSA within the community, MRSA must be prevented and controlled within the correctional system by first educating nurse professionals to give them the self-confidence to take preventive actions.

## **Project Strengths and Limitations**

### **Strengths**

The strengths of this study included the ability to reach nurses and NPs from various correctional facilities and with different levels of experience within the correctional field by using social media. Another strength of the study was the use of a self-developed survey that was found to be content valid (S-CVI = .80). In the literature, most studies assessed either knowledge or healthcare professionals' health beliefs (i.e. Easton et al., 2007; Fadeyi et al., 2011; Wolf et al., 2008). A strength of this project was the assessment of the nurse professionals' knowledge and perceptions of MRSA to

provide insight into recommendations needed to improve adherence to practice guidelines.

### **Limitations**

There were several limitations to this study. The sample size was small because there was not a good response rate from the nurse professionals on social media. Due to the small sample size, the results could not be generalized to the larger population. This survey did not seek to gain the nurse professionals' perception in their own words using a qualitative approach. An advantage of the qualitative approach is the ability to gather a subjective perspective of the participants' health beliefs (Terry, 2012). The Cronbach's  $\alpha$  value was 0.67, which did not meet the desired value of greater than 0.70 (Polit, 2010). Furthermore, this study did not assess the knowledge and health beliefs of other health professionals within the correctional setting.

### **Recommendations for Future Research**

Future research should include conducting a needs assessment to determine the educational needs of the health professionals. By conducting a needs assessment, the information could be used to help strengthen program planning and develop interventions targeted to the specific needs of the nursing professionals (Rosenstock, 1988). Additional areas of potential research would be to include other health professionals in the correctional setting in assessing their knowledge and health beliefs regarding MRSA. Last, future researchers should use a qualitative approach in assessing the perceptions of nurse professionals. The qualitative research design allows the researcher to study the

whole person's individualized responses and organizing them into meaningful data (Burns & Grove, 2009).

### **Analysis of Self**

The DNP project has provided me with the entry-level skills of an effective nurse scholar. This experience has given me the skills to effectively research the literature and gather valuable information to formulate research questions. It has also helped me in improving my writing skills to effectively articulate my goals in nursing practice. Most of all, it has broadened my knowledge on statistical methods and using SPSS for statistical analysis. Before starting this program, I had limited knowledge on how to perform statistical tests and transform these results into answers for research questions. My future goals are to educate future nurses and to disseminate my research projects into nursing publications.

The DNP project has also been influential in developing my skills as a practitioner. As a practicing nurse practitioner, I am constantly reading the literature to gather more knowledge in treating my patients with evidence that has been found effective. By understanding the levels of research evidence, I am able to analyze a research article as a guide to best practice. This project has given me the confidence to not only be a good practitioner, but to also evaluate and improve nursing practice. It has opened up my eyes to the possibility of being a practitioner and a scholar. In the future, I plan to assist others in developing these skills through education and research to help advance themselves as scholars and strengthen their careers in nursing practice.

### **Summary**

In conclusion, this study has given scholar practitioners a platform to build on to prevent the spread of MRSA within the correctional system. The HBM permitted the identification of the most perceived barriers (lack of training/education) and the preferred educational cues to action (in-services). Although, there were variations in the number of correct responses when assessing the nurse professionals' knowledge regarding MRSA, no significant differences were found. An overall need for MRSA knowledge improvement among RN/LPNs and NPs emerged. Because the correctional system may be an important reservoir for MRSA back into the community, MRSA must be prevented and controlled within the correctional system through education. By increasing nurse professionals' MRSA knowledge, they will gain the self- confidence to take on preventive actions. Self-efficacy helps in initiating a behavioral change (Rosenstock et al., 1988). Future research is needed to assess the educational needs of the nurse professionals to identify targeted interventions in reducing the prevalence and transmission of MRSA in the correctional setting.



## Section 5: Scholarly Product

This section will provide a sample manuscript that will be presented to the *Journal of Correctional Health Care* (JCHC) for publication. The JCHC is the only peer-reviewed journal addressing correctional healthcare topics. Its mission is to provide healthcare professionals and administrators the trends and developments within correctional healthcare. Requirements of submission include limiting the manuscript to 15 pages or 5,000 words not including the tables/figures, an abstract of 125 words maximum, a letter of submission, and curriculum vitae.

Correctional Nurses' Knowledge and Perceptions of Methicillin-Resistant

*Staphylococcus aureus*

Manuscript

Deborah Hall Winbush FNP-C, DNPc

Abstract

Since 1999, Methicillin-resistant *Staphylococcus aureus* (MRSA) outbreaks have occurred in many correctional facilities. Even after the Federal Bureau of Prisons developed MRSA guidelines, the prevalence of MRSA decreased only insignificantly. Accordingly, this project was designed to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA clinical guidelines in correctional settings. Through the health belief model, this project examined the nurse professionals' perceptions as well as their level of knowledge regarding MRSA. It was determined that the most reported barrier by nurse professionals was the lack of training/education (64%) and the most preferred method of receiving MRSA education was through in-services (73%). Based on the findings, it is recommended that the educational needs of the nurse professionals become the priority when designing infection control programs.

*Keywords: correctional healthcare; nurses; Methicillin-resistant Staphylococcus aureus; health belief model; infection control*

## **Introduction**

In the 1990s, community-associated MRSA (CA-MRSA) emerged in the community among previously healthy adults and children from a genetically distinct strain of the hospital-associated MRSA (HA-MRSA) (Aiello, Lowy, Wright, & Larson, 2006; Farley et al., 2008). While CA-MRSA has quickly emerged in the community setting, more confirmed outbreaks of MRSA have steadily risen in correctional facilities. Since 1999, outbreaks of MRSA have occurred in multiple correctional facilities (CDC, 2003). However, there have been very few published rates of CA-MRSA in the correctional setting (Baillargeon, Kelley, Leach, Baillargeon, & Pollack, 2004). Correctional facilities face unique challenges in eradicating CA-MRSA. Recent studies have reported risk factors of CA-MRSA to include crowded living facilities, poor hygiene, sharing of personal items, high rates of skin disease, and high rates of immunosuppression (Baillargeon et al., 2004).

Correctional facilities provide a unique context for MRSA transmission due to the presence of numerous risk factors (Farley et al., 2008; Malcolm, 2011). In addition, MRSA has been identified to be more prevalent within the correctional population than in the general population. Each year correctional facilities house and release millions of individuals from these facilities.

The most commonly known correctional facilities are prisons, jails, and detention centers. In these facilities, inmates or detainees are held for various periods from temporary to long-term sentences. Jails and detention facilities have a higher turnover rate because inmates have a shorter average length of stay as compared to inmates in

prisons. This puts these facilities at a higher risk because they may receive more infected or colonized individuals from the community and have a higher rate of sending those newly infected or colonized back into the community as compared to prison inmates, who have a greater incidence of within prison transmission due to less frequent discharge of inmates (Malcolm, 2011).

Because many incarcerated individuals move through the correctional setting, the potential of spreading CA-MRSA between facilities and the community are greatly increased (David, Mennella, Mansour, Boyle-Vavra, & Dunn, 2008). Therefore, the Federal Bureau of Prisons (FBOP; 2012) provided guidelines to specifically discuss the management of MRSA within correctional facilities (Malcolm, 2011). The guidelines outline protocols, diagnosis, treatments, and infection control preventive measures (FBOP, 2012). All correctional settings were encouraged to use these guidelines and develop standardized practice protocols to aid in the prevention, treatment, and containment of MRSA within their environment (FBOP, 2012). Unfortunately, even after the dissemination of practice guidelines, MRSA infections within correctional settings did not decrease significantly (CDC, 2003).

With the rise of MRSA within the correctional setting, nursing professionals play a unique role in the prevention and control of MRSA. It has become increasingly apparent that infection control compliance among nursing professionals is not optimal in reducing MRSA incidence and transmission (Wolf, Lewis, Cochran, & Richards, 2008). Several studies have identified that the nonadherence to infection control practice guidelines by clinicians and the inconsistencies of compliance with infection control

precautions have contributed to the transmission of resistant pathogens (Gammon, Morgan-Samuel, & Gould, 2007; Giblin et al., 2004; Osborne, 2003).

A group of investigators in the Public Health Service originally developed the health belief model (HBM) in the early 1950s (Rosenstock, 1974). The theory grew from a set of independent, applied research problems constructed to explain why individuals failed to use free or very low cost preventive services (Rosenstock, 1974). Social psychological theories dealing with an individual's subjective state of health behavior influenced the model (Rosenstock, 2005). The researchers believed health actions were motivated by the degree of fear to avoid illness and the benefits obtained from alleviating illness (McEwen & Wills, 2011; Rosenstock, 1974). The HBM is most widely used for explaining health behaviors and has been studied within the context of many health problems (Carpenter, 2010).

The HBM suggests that by changing one's individual perception, the likelihood of a positive health behavior change increases (McEwen & Wills, 2011). The model consists of several concepts that explain health behavior, including (a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, (d) perceived barriers, and (e) cues to action (Carpenter, 2010; Rosenstock, 1974). Another concept was added to the original model later, which identified self-efficacy as an important factor in health behavior change (Carpenter, 2010). It was determined that the overall knowledge and beliefs were not sufficient and individuals needed the overall motivation to change (McEwen & Wills, 2011). The HBM in Figure 1 depicts the concepts contributing to individual health beliefs. In assessing the health beliefs of a target population, researchers can use the

HBM to strengthen program planning, encourage educators/supervisors to continue needs assessments, and target specific identified needs (Rosenstock, Strecher, & Becker, 1988).

A major challenge in national guideline implementation is achieving compliance among healthcare providers to read the guidelines, appreciate their importance, and incorporate them into their practice (Brinsley, Sinkowitz- Cochran, Cardo, & The CDC Campaign to Prevent Antimicrobial Resistance Team, 2005; Gammons et al., 2007; Stein, Makarawo, & Ahmed, 2003). Therefore, effective means in controlling the transmission of MRSA within this setting would include improving infection control compliance among healthcare professionals. Researchers have linked the adoption of infection control practices to individual health beliefs concerning perceived susceptibility to the infection and the ability to prevent transmission (Brinsley et al., 2005)

Knowledge is essential in the prevention and control of MRSA (da Silva, de Carvalho, de Silva Canini, de Almeida Cruz, & Simones, 2010). Healthcare professionals who were compliant with infection control practices were more likely to have had adequate knowledge of evidence-based practice compared to their noncompliant colleagues (Brady, McDermott, Cameron, Graham, & Gibb, 2009). By examining the nurse professionals' health beliefs and knowledge, researchers can address improvements to infection control interventions and educational programs. This study will assist in developing recommendations that will contribute to the nurse professionals' adherence to MRSA practice guidelines.

### **Purpose and Problem Statement**

The purpose of this study was to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in the correctional setting. The challenges of controlling MRSA not only involved eliminating risk factors associated with this population, but also the adherence of infection control guidelines by nursing professionals involved in patient care delivery. While guidelines exist to improve practice and patient outcomes, it is compliance to these guidelines that reduces the incidence of MRSA. Examining nurses' health beliefs and level of knowledge regarding CA-MRSA prevention and risk can provide insight into the problems in current practice, barriers, and educational needs of the healthcare professionals.

### **Method**

This study used a quantitative descriptive study design to assess correctional nursing professionals' self-reported level of knowledge and perceptions of MRSA to gain further insight in a setting where little research had been conducted. This design was used to gather an overview of the nurses' level of knowledge and health beliefs without affecting them in any way to provide evidence-based recommendations that could be used in future infection control program planning and implementation.

Participants for this descriptive study included seven LPNs, 17 RNs, and 12 NPs currently employed in a U.S. correctional facility, with full- or part-time employment, over the age of 18, and those able to read and understand English. Those excluded from the study included correctional support staff, correctional officers, healthcare staff with

no direct patient care, anyone under the age of 18, and those employed in a non-U.S. correctional facility. This purposive sample was located through LinkedIn.

### **Data Collection**

Approval from Walden University IRB was received on September 19, 2014. Permission was received from the group administrator on LinkedIn to post an invitation and survey link on the website. An informed consent page was presented to all the participants. The participants who agreed to participate were then taken to the survey instrument entitled “Knowledge and Health Beliefs Regarding MRSA Questionnaire.” The survey responses were limited to one response per computer, the participants were able to edit their responses until the last page of the survey was completed, and the survey remained anonymous with no IP addresses stored.

### **Data Analysis**

All quantitative information regarding the healthcare professionals’ knowledge and health beliefs about MRSA were transcribed through descriptive statistics and inputted into a statistical software using SPSS 21. Statistical analysis was conducted by using the nonparametric chi-square test and Fisher’s exact test to explore a relationship between the nurse professionals. Tables and graphs demonstrated statistical results. The demographic information provided valuable insight about the study participants, including their profession, age, gender, number of years in their profession, and their number of years in the correctional setting.

Descriptive statistics was used to provide summaries about the data collected from closed-ended questions. A frequency distribution was developed for the survey



responses received from the participants. The qualitative data was analyzed by using an open coding method. Based on this analysis, key phrases from the participants' responses were placed into themes/categories to provide additional feedback (Burns & Grove, 2009).

### **Content Validity and Reliability**

In designing an original instrument, the researcher must take multiple steps in ensuring validity and estimating reliability (Burns & Grove, 2009). The validity of an instrument ensures that the instrument measures what it actually intends to measure (Terry, 2012). In this study, a content validity index determined the content validity of individual items (I-CVI) and the overall scale/subscales (S-CVI). Ten professional experts with extensive knowledge on publication, clinical research, and the content being measured were asked to give valuable feedback on the study instrument. Of the 10 experts, six completed the survey in its entirety.

The experts who participated were all female and in the nursing profession. Of the six expert professionals, five had doctoral degrees, more than 20 years in their profession, and had published their research. The one expert panel with the highest degree of a master's, no published research, and between 10-15 years in her profession was chosen due to her extensive knowledge in correctional healthcare. The I-CVI scores ranged from 0.83 to 1.00. The S-CVI score for this survey instrument was 0.96.

The statistical procedure used to measure internal consistency was the Cronbach's  $\alpha$ . Cronbach's  $\alpha$  is useful in determining reliability in survey tools using the Likert scale for interval or ratio level data (Burns & Grove, 2009; Terry, 2012). The coefficients

values between 0.70 and 0.75 are assumed adequate but coefficient values of 0.80 or higher are highly desirable in determining the instrument's quality and high reliability (Polit, 2010). The Cronbach's  $\alpha$  value was 0.67 on the Likert- scale responses regarding the nurse professionals' health beliefs.

## **Results**

Eighty-four nurse professionals, RNs, LPNs and NPs agreed to participate in the study and four did not agree to participate. Of the 84 who agreed to participate, 48 either did not respond to any questions or only responded to the demographic questions and did not attempt to answer the knowledge and/or health belief questions. These 48 were excluded from the analysis. For the purpose of data analysis, the nursing professionals were divided into two groups; RN/LPNs were separated from the NPs. In total, 36 nursing professionals were included in this study. Of these, 67% ( $n = 24$ ) were RN/LPNs and 33% ( $n = 12$ ) were NPs. Table 1 presents the nurse professionals' demographics. The majority of the nurse professionals were female (78%), a RN/LPN (67%), between the ages of 45-54 (42%), White/Caucasian (75%), with greater than 5 years in their profession and in the correctional field (69% and 56%), currently employed at a jail (53%), and employed full-time (78%).

### **Nurse Professionals' Knowledge Regarding MRSA**

Although there were considerable variations in correct responses among the LPN/RNs and NPs, no significant differences were found after using the alternative test, Fisher's exact test (Table 2). This test determined if the two variables (profession and correct responses) were independent or related. The Fisher's exact test replaces the chi-

square test when the expected frequencies in a 2x2 table are less than five (Field, 2009; Polit, 2010).

The majority of the participants (92%) correctly identified MRSA as resistant to beta-lactam antibiotics. RN/LPNs were 88% ( $n = 21$ ) correct compared to NPs, who were 100% ( $n = 12$ ) in correctly responding to this question. Eighty-three percent ( $n = 20$ ) of RN/LPNs compared to 58% ( $n = 7$ ) of NPs identified the exception in identifying risk factors that increase suspicion of MRSA. There was no significant difference between the RN/LPNs and NPs identifying the correct risk factors that increase suspicion of MRSA ( $p = 0.126$ ).

The most common clinical presentation of CA-MRSA was correctly identified by 72% of RN/LPNs and NPs ( $n = 16$  and  $n = 10$ , respectively). Although, NPs were more likely to answer correctly the most common clinical presentation compared to RN/LPNs (83% vs. 67%), the difference was not significant ( $p = 0.438$ ). The *true/false* question regarding intake screening for skin infections was correctly answered by 86% ( $n = 31$ ) of the respondents. Of the 86% who answered correctly, more RN/LPNs responded correctly when compared to NPs (88% vs. 83%).

Fewer participants (56%) responded correctly to the most common method of MRSA transmission. Question 15 stated that the diagnosis of probable MRSA should not be made empirically when inmates presents with a skin and soft tissue infection within a known MRSA outbreak. Sixty-four percent responded correctly by identifying this question as a *false* statement. Regarding the probable diagnosis of MRSA being treated empirically, only 64% ( $n = 23$ ) of the participants responded correctly. All participants

accurately identified hand washing as the simplest and most important infection control measure for preventing and containing MRSA infections, except for one participant who did not answer.

Eighty-three percent ( $n = 10$ ) of NPs correctly responded to single-cell housing recommendations, compared to 71% ( $n = 17$ ) of RN/LPNs who responded correctly. Seventy-two percent ( $n = 26$ ) of RN/LPNs and NPs correctly answered that antibiotic therapy used to treat presumed or confirmed MRSA infection should be directly observed via pill line. The majority of the participants (92%) correctly identified MRSA as a life-threatening infection.

### **Nurse Professionals' Health Beliefs Regarding MRSA**

The nurse professionals were asked to rank their health beliefs regarding MRSA by using a 5-point Likert scale from 1= *strongly disagree* to 5= *strongly agree*. The median score results were 4.0 and 5.0 and a *SD* range from 0.557-1.155. After reducing the Likert scale responses to the nominal level by combining all agree and disagree responses, a Fisher's exact test was performed. RN/LPNs were significantly more likely than NPs to perceive MRSA as a risk to themselves (87%,  $n = 20$ ) ( $p < 0.05$ ). However, RN/LPNs felt less likely that they were at a greater risk of acquiring MRSA while caring for infected inmates/detainees (55%,  $n = 15$ ) compared to NPs (82%,  $n = 9$ ) ( $p = 0.410$ ). The descriptive statistics providing a comparison of the participants' responses are shown in Table 3. There were no other statistically significant findings between the RN/LPNs and NPs health beliefs.

**Barriers to MRSA prevention in the correctional setting.** The participants were asked to identify barriers to MRSA prevention in the correctional setting. They were given the following choices: (a) absence of supplies (gloves, PPE), (b) lack of testing for MRSA, (c) lack of training/education, (d) lack of teamwork, (e) decreased number of staff on duty, and (f) other. Each participant could choose more than one response and comment in their own words regarding a barrier to MRSA prevention that was not included in the choices. The barriers that were described in the participants' own words were analyzed using open coding. According to Burns and Grove (2009), coding is a method of categorizing data. The codes summarized what the participants identified as barriers.

The most frequently reported barrier by both RN/LPNs and NPs was the lack of training/education (73% and 70% respectively). One participant commented on their identified barrier as, "lack of training in proper cleaning of exam rooms and quarters." This response was coded under training/education. Another participant commented that access to running water was also a barrier. This comment was coded under lack of supplies. The least reported barriers expressed in their own words by RN/LPNs were the lack of time (5%) and the lack of space (5%). Although no significant differences between the barriers to MRSA prevention identified by the nurse professionals, RN/LPNs identified more barriers to MRSA prevention compared to NPs (Table 4).

**Method for educational information on infection control.** The participants were asked to identify their preferred method for receiving educational information on infection control (Figure 2). The choices given to the participants included (a) in-services, (b), infection control officer, (c) Internet-based training, (d) journal articles, (e) word of mouth, and (f) other. The participants had the option to choose more than one answer. Only one participant commented on their preferred method. The comment given was a “lunch and learn program.” This response was coded under in-services.

The most preferred method by the nurse professionals (67%,  $n = 24$ ) for receiving infection control information was in-services (Table 5). The least preferred method by the nurse professionals was word of mouth (17%). However, NPs (73%) also indicated Internet-based training as a preferred method of receiving infection control information. While RN/LPNs also preferred receiving infection control information from the infection control officer (50%) ( $p = 0.132$ ), no significant differences existed between the RN/LPNs’ and NPs’ preferred method of receiving MRSA infection control information. However, female nurse professionals (56%) were significantly more likely to identify journal articles as their preferred method of receiving infection control education when compared to male nurse professionals ( $\chi^2 = 7.781$ ,  $df = 1$ ,  $p = 0.005$ ).

**Confidence in taking preventive action.** Each participant rated their confidence level in taking preventive actions to prevent and control MRSA transmission in their facility. The nurse professionals’ median score result was 5.0 and  $SD = 14.252$  on a scale of 1= *not at all confident* to 5= *confident*. Overall, the nurse professionals reported being somewhat confident and confident in taking preventive actions to prevent and control

MRSA transmission in their facility (78%,  $n = 28$ ). Although no significant difference existed in the RN/LPNs' and NPs' confidence in taking preventive action, RN/LPNs were more confident when compared to the NPs (80% vs. 75%). However, 13% ( $n = 3$ ) of RN/LPNs were not at all confident to take preventive action compared to 8% ( $n = 1$ ) of NPs (Table 6).

### **Discussion**

This study demonstrates a considerable amount of knowledge among the RN/LPNs and NPs with a total knowledge percentage of greater than 70% concerning the epidemiology, risk factors, clinical presentation, screening, prevention, and treatment of MRSA. However, there was an overall lack of knowledge concerning the method of transmission and diagnosis of MRSA among the RN/LPNs and NPs, which could explain some noncompliance with practice guidelines if nursing professionals are not able to diagnosis MRSA correctly or do not know how MRSA is transmitted. Although, there were some differences among the nurse professionals' level of knowledge regarding MRSA, there is clearly evidence that supports the need for an overall knowledge improvement.

The RN/LPNs were more knowledgeable about the risk factors of MRSA whereas the NPs demonstrated a higher awareness in the clinical presentation, prevention, and treatment of MRSA. Considering these results, there is a need for more educational interventions in improving nurse professionals' adherence to practice guidelines. This need for more educational interventions were also found in the literature among clinicians involved in the care of MRSA infected patients (Brady et al., 2009; Easton et al., 2007;

Fadeyi et al., 2011; Stein et al., 2003). To improve infection control practices, improving clinicians' level of knowledge about MRSA must become a priority (Easton et al., 2007). Nevertheless, according to this study, the importance of hand washing appears to be effectively taught in the education into the practices of all nursing professionals.

While nursing professionals' level of knowledge is important in the adherence of practice guidelines, perceptions influence health behavior. In planning programs, many educators have used the HBM to assess the needs of the target population, understand risk behaviors, and develop strategies for disease prevention (Rosenstock et al., 1988; da Silva et al., 2010). In this study, a survey was developed to assess the health beliefs of nursing professionals in the correctional setting regarding MRSA using the HBM. The HBM variables examined the individual's perceived susceptibility, perceived severity, perceived benefits of taking action, perceived barriers to taking action, cues to action, and self-efficacy.

The perception of susceptibility refers to the subjective risk of contracting a condition (Rosenstock, 1974). In this dimension of the HBM, study participants were asked if MRSA could pose a risk to themselves. Most participants perceived MRSA as a personal risk (77%). As well, 64% ( $n = 23$ ) also perceived themselves at a greater risk of acquiring MRSA while caring for an infected inmate/detainee. In the HBM, an individual's perception is a predictor of their health behavior (Brinsley et al., 2005). Since the participants perceived MRSA to be a risk to self and an even greater risk while caring for an infected inmate/detainee, they would be more likely to adopt preventive behaviors. The remaining participants believed there were no risk or were indecisive and



would therefore be less likely to adopt these changes, suggesting the need for the development of preventive behaviors. Other studies in the literature also concluded that if one perceived a susceptibility to a disease, they were more likely to participate in a preventive behavior (Brinsley et al., 2005; Lee, Kim, & Han, 2009; da Silva et al., 2010; Wolf et al., 2008).

Twenty-two percent ( $n = 8$ ) of nurse professionals believed MRSA was not a problem at their correctional facility. This result suggests there may be a need for improvements in understanding the risk of MRSA in the participant's correctional facility. According to the HBM, an individual who does not perceive themselves to be susceptible to harm will not act to prevent a negative health outcome (Carpenter, 2010). This is an unfortunate circumstance because the correctional setting has an increasing prevalence of MRSA (Malcolm, 2011).

Another dimension of the HBM is the perception of severity, which predicts that if an individual perceives the severity of a negative outcome as a more complex health problem that could affect their job, family life, and social relations, they would be motivated to avoid such an outcome (Rosenstock, 1974). Seventy-two percent ( $n = 26$ ) agreed that hand-washing frequency should be greater while delivering care to infected detainees and 89% ( $n = 32$ ) believed that MRSA could cause a severe infection. The increased awareness that MRSA could lead to negative outcomes suggests that the participant's knowledge of MRSA risk is understood. The perceived susceptibility and severity have a strong correlation to an individual's knowledge of a health problem (Rosenstock, 1974). As in the study regarding Korean immigrants' acceptance of

mammography, those with perceived susceptibility and severity of breast cancer were more likely to participate in mammography screening (Lee et al., 2009).

The perceived benefits of taking action relates to the effectiveness of a known action in reducing a negative health outcome (Rosenstock, 2005). A person's beliefs about the availability and effectiveness of an action will determine the course of the individual. In this study, 86% ( $n = 31$ ) of the participants reported that infection control practices could help reduce the prevalence of MRSA and 91% ( $n = 33$ ) believed that hand washing was the most influential aspect in infection control. The researchers evaluating factors related to nurses' adherence to preventive measures found that 94% believed that preventive measures could be beneficial (da Silva et al., 2010). This is an important factor in planning programs because if one believes a preventive measure would be beneficial it encourages prevention strategies.

An individual who believes an action is effective in reducing negative outcomes but at the same time sees that this action is inconvenient, expensive, painful, and/or challenging, their adoption of preventive measures will unlikely occur (Carpenter, 2010; Rosenstock, 1974). According to Rosenstock (1974), these negative aspects of an action serve as a barrier to action. If the benefits of taking action are high and the barriers are weak, the action is likely to happen; however, if the benefits of taking action are low and the barriers are seen as strong, the action is likely not to happen (Rosenstock, 1974). The greatest barrier perceived by the participants in this study was the lack of training/education (64%).

The decreased number of staff on duty (39%) was the next most cited barrier to taking preventive action. A similar study also cited training, education, and adequate number of staff as barriers to preventive measures (da Silva et al., 2010). Other cited barriers included lack of testing, teamwork, and absence of supplies. Given the most frequently cited barrier of lack of training and education among the correctional nurse professionals, more emphasis on education would be an appropriate action in reducing the prevalence of MRSA. This suggests that the nurse professionals are not receiving adequate education about MRSA and this should serve as an important cue to action by creating a preferred method of receiving educational information.

Cues to action are also a variable within the HBM that establishes an individuals' readiness to act. Ones' readiness to act is demonstrated by the combined levels of perceived susceptibility and severity of a negative outcome and perceived benefits (Rosenstock, 1974). In this study, the most preferred educational cues included in-services (67%) and Internet-based training (50%). Because the nurse professionals rely mostly on in-services and Internet-based training, having access to these educational opportunities would be beneficial. Suggestions include offering in-services multiple times throughout the year and making Internet-based training available to those who prefer this method.

However, there were differences among the nurse professionals in identifying their preferred educational cues. This would suggest a slightly more different educational approach when educating RN/LPNs versus NPs about MRSA infection control and prevention. A similar report also identified in-services as the most preferred educational

cue as well as identifying differences in cues to action among health professionals (Wolf et al., 2008). The infection control officer ranked higher among RN/LPNs (50%) as the favored educational cue. Having access to an infection control officer would be a valuable and beneficial source in eliminating barriers to MRSA prevention. Since infection control officers are the favored among RN/LPNs, they could serve by providing ongoing reinforcements of infection control strategies.

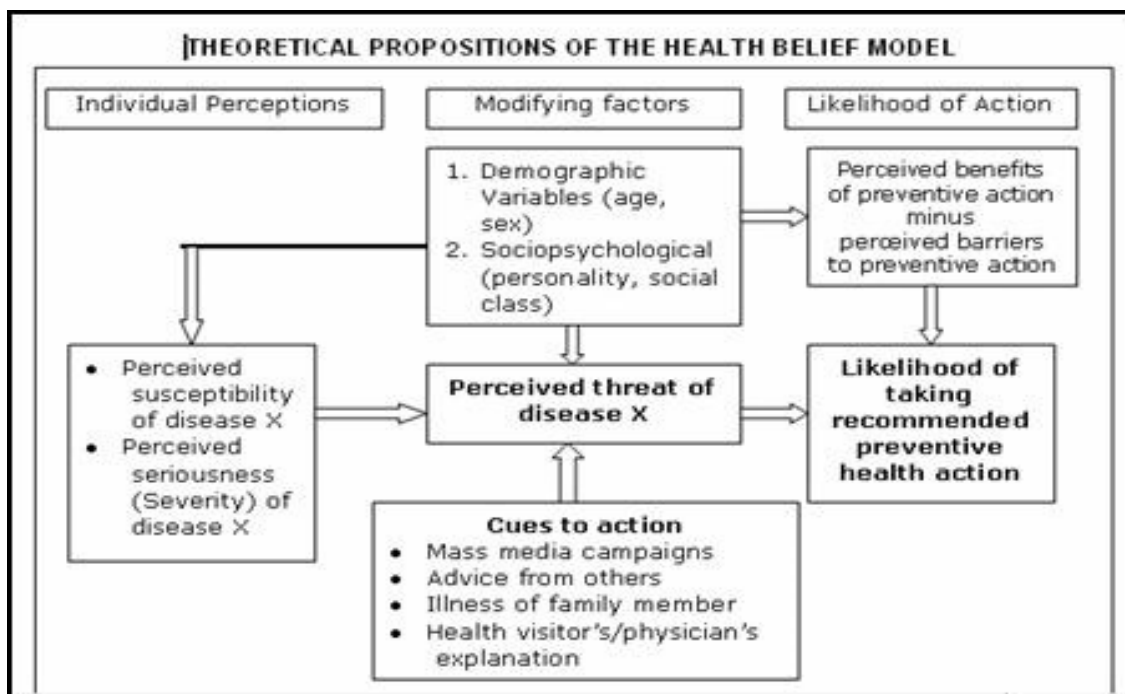
Self-efficacy was an additional variable of the HBM that was added later by Rosenstock (McEwen & Wills, 2011). The earlier focus of the HBM was on simple preventive actions and it was believed that this target group had adequate self-efficacy regarding a recommended behavior and therefore it was not recognized (Rosenstock et al., 1988). Today, individuals are requiring long-term changes that involve modifying their lifestyles. To make a change in behavior, one must hold a certain level of confidence to make a change. In this study, the participants reported a 78% ( $n = 28$ ) confidence level in taking preventive actions to prevent and control MRSA transmission. This result suggests the nurse professionals felt themselves competent in taking preventive actions. According to the Rosenstock et al. (1988), self-efficacy has two values in the HBM; it delimits the barriers and suggests new and more productive lines for research and practice.

### **Conclusion**

Future research should include conducting a needs assessment to determine the educational needs of the health professionals. By conducting a needs assessment, the information gathered could help strengthen program planning and develop interventions

targeted to the specific needs of the nursing professionals (Rosenstock, 1988). Other areas of potential research would be the inclusion of other health professionals in the correctional setting in assessing their knowledge and health beliefs regarding MRSA. Last, future researchers should use a qualitative approach in assessing the perceptions of the nurse professionals. Because the correctional system may be an important reservoir for MRSA transmission back into the community, MRSA must be prevented and controlled within the correctional system through effective training and education. By increasing nurse professionals' MRSA knowledge, they will gain the self-confidence to take on preventive actions and maintain practice guideline compliance.

### Tables and Figures



*Figure 1.* Health belief model. From “Selected psychosocial models and correlates of individual health-related behaviors,” by M.H. Becker, D.P. Haefner, S.V. Kasl., et al., 1977, *Medical Care*, 15, p.30 . Reprinted with permission.

Table 1

*Sample Characteristics (N=36)*

Characteristic	Frequency	Percent
<b>Profession</b>		
RN/LPN	24	67
NP	12	33
<b>Gender</b>		
Female	28	78
Male	8	22
<b>Age</b>		
25-34	3	8
35-44	6	17
45-54	15	42
55-64	11	31
>65	1	3
<b>Ethnicity</b>		
American Indian or Alaskan Native	1	3
Asian or Pacific Islander	2	6
Black or African American	6	17
White/Caucasian	27	75
<b>Correctional Facility (Jail)</b>		
Yes	19	53
No	17	47
<b>Correctional Facility (Detention Center)</b>		
Yes	10	28
No	26	72
<b>Correctional Facility (Prison)</b>		
Yes	16	44
No	20	56
<b>Years in their Profession</b>		
Less than or equal to 5	11	31
Greater than 5	25	69
<b>Years in the Correctional Field</b>		
Less than or equal to 5	16	44
Greater than 5	20	56
<b>Employment Status</b>		
Full time	28	78
Part time	8	22

*Note.* N=total number of participants

Table 2

*Summary of Correct Questionnaire Responses from Nursing Professionals Regarding**MRSA*

Question	Total N(%)	RN/LPN N(%)	NP N(%)
Staph bacteria found on the skin and in the nose of healthy persons that are sensitive to beta-lactam antibiotics	33(92)	21(88)	12(100)
These risk factors increase suspicion of MRSA infection except	27(75)	20(83)	7(58)
The most common clinical presentation of CA-MRSA are	26(72)	16(67)	10(83)
Only inmates during the intake medical screening and physical examination with diabetes, immunocompromised, open wounds, recent surgery, and chronic skin conditions should be carefully evaluated for skin infections	31(86)	21(88)	10(83)
The most common method of MRSA transmission is through	20(56)	14(58)	6(50)
The diagnosis of probable MRSA should not be made empirically when inmates present with a skin and soft tissue infection (SSTI) within a known MRSA outbreak	23(64)	16(67)	7(58)
Hand washing before and after every patient contact whether or not gloves are worn is the simplest and most important infection control measure for preventing and containing MRSA infections	35(97)	23(100)	12(100)
Single cell housing is recommended if:	27(75)	17(71)	10(83)
Antibiotic therapy that are used to treat presumed or confirmed MRSA infections should be directly observed via pill line	26(72)	16(67)	10(83)
Untreated MRSA infections do not result into life threatening infections	33(92)	22(92)	11(92)

*Note.* N= number of responses. % = percent of total responses correct



Table 3

*Number (Percentage) of Responses from Nurse Professionals Regarding Their MRSA**Health Beliefs*

Question	Strongly Disagree N(%)	Disagree N(%)	Neutral N(%)	Agree N(%)	Strongly Agree N(%)
Do you feel that MRSA can pose a risk to yourself					
RN/LPNs	0	3(13)	0	18(78)	2(9)
NPs	0	1(9)	2(18)	3(27)	5(46)
Do you feel that you are at a greater risk of acquiring MRSA while caring for an infected inmate/detainee					
RN/LPNs	0	3(13)	6(26)	12(52)	2(3)
NPs	0	0	2(18)	6(55)	3(27)
Do you feel that MRSA is a problem at your correctional facility					
RN/LPNs	0	6(26)	6(26)	5(22)	6(26)
NPs	0	2(18)	1(9)	4(36)	4(36)
Do you feel that hand washing frequency should be greater while delivering care to detainees with MRSA					
RN/LPNs	0	4(17)	2(9)	10(44)	7(30)
NPs	0	0	2(18)	2(18)	7(64)
Do you feel that MRSA can cause a severe infection					
RN/LPNs	0	0	1(4)	7(30)	15(16)
NPs	0	1(9)	0	2(18)	8(73)
Do you feel that infection control practices help reduce the prevalence of MRSA					
RN/LPNs	0	1(5)	1(5)	6(27)	14(64)
NPs	0	0	0	4(36)	7(64)
Do you feel that hand washing is the most influential aspect in infection control					
RN/LPNs	0	0	1(4)	9(39)	13(14)
NPs	0	0	0	3(27)	8(73)

*Note.* N= number of responses. %= percent of total responses.

Table 4

*RN/LPNs and NPs Identified Barriers to MRSA Prevention in the Correction Setting*

Barriers	Yes N(%)	No N(%)
Absence of supplies (gloves, PPE)		
RN/LPNs	7(32)	15(68)
NPs	1(10)	9(90)
Lack of testing for MRSA		
RN/LPNs	10(45)	12(55)
NPs	2(20)	8(80)
Lack of training/education		
RN/LPNs	16(73)	6(27)
NPs	7(70)	3(30)
Lack of teamwork		
RN/LPNs	8(36)	14(64)
NPs	1(10)	9(90)
Decrease number of staff on duty		
RN/LPNs	10(45)	12(55)
NPs	4(40)	6(60)
Lack of space		
RN/LPNs	1(5)	21(96)
NPs	0	10(100)
Lack of time		
RN/LPNs	1(5)	21(96)
NPs	0	10(100)

*Note.* N= total of responses. % = percent of the total responses.

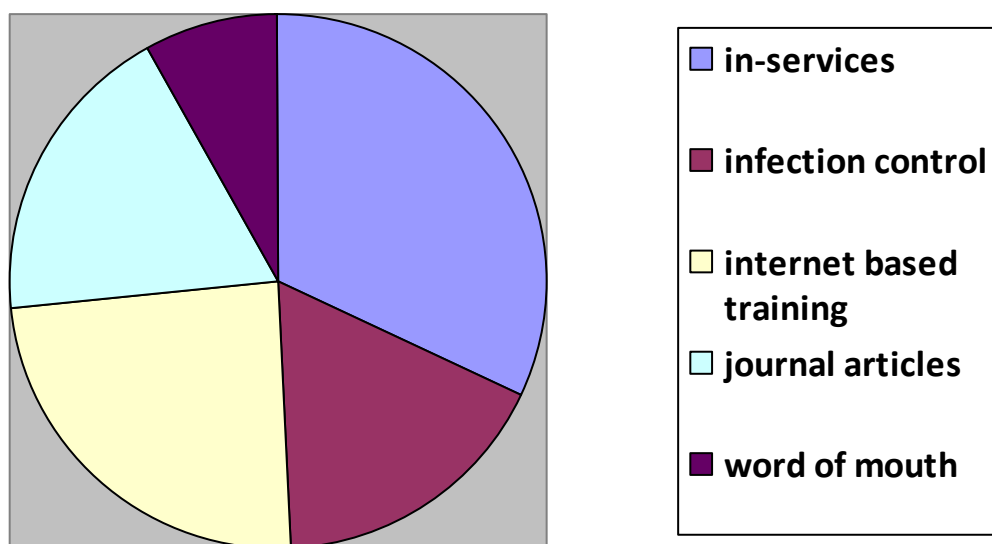


Figure 2. Preferred method of receiving educational information

Table 5

*Preferred Method for Receiving Educational Information on Infection Control Practices and MRSA Prevention*

Preferred Method	Total N(%)	RN/LPNs N(%)	NPs N(%)
In-services	24(67)	16(73)	8(73)
Infection control officer	13(36)	11(50)	2(18)
Internet based training	18(50)	10(46)	8(73)
Journal articles	14(39)	8(36)	6(55)
Word of mouth	6(17)	4(18)	2(18)

Note. N= number of yes responses. % = percent of yes responses

Table 6

*Confidence Taking Preventive Action*

Profession	Not at all confident <i>N</i> (%)	Not very confident <i>N</i> (%)	Neutral <i>N</i> (%)	Somewhat Confident <i>N</i> (%)	Confident <i>N</i> (%)
RN/LPNs	3(13)	0	0	9(38)	10(42)
NPs	1(8)	0	1(8)	1(8)	8(67)

*Note.* *N*= number of responses. %= percent of total responses.

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## Appendix A: NIH Ethical Training Certificate



## Appendix B: Web Invitation

Dear Colleagues,

I am a Doctorate of Nursing Practice student at Walden University and I am asking you to assist me in my research study by answering a few survey questions. You are invited to take part in an evidence-based project assessing nurses' knowledge and health beliefs regarding Community Associated Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA) in the correctional setting. This study has been approved by Walden University's IRB. I am inviting all correctional nurses currently employed in a US correctional facility to take part in this study. Your participation is strictly voluntary.

If you would like to participate, please click on the link below to access the survey. Please, also forward this invitation and link to your colleagues and/or staff.

<https://www.surveymonkey.com/s/CAMRSA>

Thank you for your participation,

Deborah Winbush, FNP-C

Doctor of Nursing Practice (DNP) Student

Walden University School of Nursing

## Appendix C: Informed Consent Agreement

**Please read this consent agreement carefully before you decide to participate in the study.**

You are invited to take part in an evidence-based project assessing nurses' knowledge and health beliefs about Community Associated Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA) in a correctional setting. The researcher is inviting all currently employed correctional licensed practical nurses, registered nurses, and nurse practitioners to take part in the study. This form is part of a process called informed consent to allow you to understand this study before deciding whether to take part. This study is being conducted by Deborah Winbush, FNP-C who is a doctoral student at Walden University

**Purpose of the research study:** The purpose of this study is to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in a correctional setting. This researcher believes by examining the level of knowledge in CA-MRSA prevention and the risk associated with CA-MRSA, the information gathered would be useful in providing insight into the problems in current practice, identify recommendations and educational needs of the healthcare professionals, and reducing barriers.

**What you will do in the study:** This study will focus on full and part time nurses who provide direct patient care in a US correctional setting. If you agree to participate, you will complete a self- reported knowledge and health belief questionnaire about CA-MRSA.

**Time Required:** This study will require about fifteen minutes of your time to complete the questionnaire. The questionnaire will remain open for three weeks.

**Voluntary Participation:** Your participation is completely voluntary. If you feel uncomfortable answering any question you may skip it or stop the questionnaire at any time.

**Risks:** There are no anticipated risks in this study. There will be no harm or risk involved as it relates to your employment or job performance.

**Benefits:** This study will be used to provide insight into current practice problems, identify recommendations and educational needs of the healthcare professionals, reducing barriers, and other strategies needed to prevent and control the transmission of CA-MRSA in this practice setting.

**Payment:** You will receive no payment or gifts for participating in this study.

**Confidentiality:** Your responses to the questionnaire survey will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in this study report. The information that you give in this study will not be linked to your name in any way. The data will be kept secure within the researcher's personal computer which is password protected. Data will be kept for a period of at least 5 years, as required by the university.

**Questions about the study:** If you have any questions about the study, you may contact the persons below:

Deborah Winbush, FNP-C  
DNP student  
Walden University

Kathleen Wilson, PhD, ARNP-C  
Project Chair  
Walden University

**Rights about the study:** If you have questions about your rights in the study, you may contact the person below: Walden University's approval number for this study is 08-04-14-0058336 and it expires on August 3, 2015

Dr. Leilani Endicott  
Walden University Representative  
Walden University

1. **Statement of Consent:** I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By clicking the "**I agree to participate**" link below, I understand that I am agreeing to the terms described above. By clicking the "**I do not agree to participate**" link below, I do not agree to the described terms above of the consent form and will no longer be eligible to participate in this evaluation. Please print or save this consent form for your records.

A. Yes, I agree to participate

B. No, I do not agree to participate



## Appendix D: Knowledge and Health Beliefs Regarding MRSA Questionnaire

INSTRUCTIONS: This instrument is designed to assess the knowledge and health beliefs of healthcare professionals regarding MRSA. Please answer each question to the best of your knowledge and beliefs regarding MRSA.

2. What is your profession?

- A. LPN
- B. RN
- C. NP

3. What is your gender?

- A. Female
- B. Male

4. What is your age?

- A. 18 to 24
- B. 25 to 34
- C. 35 to 44
- D. 45 to 54
- E. 55 to 64
- F. 65 or older

5. What is your ethnicity?

- A. American Indian or Alaskan Native
- B. Asian or Pacific Islander
- C. Black or African American
- D. Hispanic or Latino
- E. White/Caucasian
- F. Other

6. What US correctional facility are you employed at?

- A. Jail
- B. Detention Center
- C. Prison

7. How many years have you been in your profession?

- A.  $\leq 5$
- B.  $> 5$

8. How many years have you been in the correctional field?

- A.  $\leq 5$
- B.  $> 5$

9. What is your employment status?

- A. full time
- B. part time

10. What is MRSA?

- A. Staph bacteria found on the skin and in the nose of healthy persons that are sensitive to beta-lactam antibiotics
- B. Bacterial infection of the membranes covering the brain and spinal cord
- C. Staph bacteria found on the skin and in the nose of healthy persons that are resistant to beta-lactam antibiotics
- D. Painful inflammatory nodule that can occur anywhere on the skin surface that contains hair follicles and is subject to friction and maceration

11. These risk factors increase suspicion of MRSA infection **except**:

- A. Crowded living facilities, recurrent skin disease, history of MRSA infection
- B. Old age, male, history of heart disease within the past year, African-American race
- C. Recent antibiotic use, high prevalence of MRSA in the institution, close contact with someone known to be infected with MRSA
- D. Complaint of “spider or insect bite”, clusters of infections among persons in groups with skin to skin contact or sharing items, skin and soft tissue infection with failure to beta lactam antibiotics

12. The **MOST** common clinical presentation of CA-MRSA are:

- A. Impetigo and cellulitis
- B. Folliculitis and cellulitis
- C. Abscesses and cellulitis
- D. Abscesses and osteomyelitis

13. Only inmates during the intake medical screening and physical examination with diabetes, immunocompromised, open wounds, recent surgery, and chronic skin conditions should be carefully evaluated for skin infections.

- A. True
- B. False

14. The **MOST** common method of MRSA transmission is through

- A. Coughing or sneezing while in close contact with others
- B. Sexual intercourse by having anal, vaginal, or oral sex with someone who is infected
- C. Contaminated objects or surfaces
- D. Direct physical contact with an infected person via contaminated hands

15. The diagnosis of probable MRSA should not be made empirically when inmates present with a skin and soft tissue infection within a known MRSA outbreak.

- A. True
- B. False

16. Hand washing before and after every patient contact, whether or not gloves are worn is the simplest and most important infection control measure for preventing and containing MRSA infections

- A. True
- B. False

17. Single cell housing is recommended if

- A. The inmate is uncooperative
- B. The weeping wound cannot be contained
- C. The drainage is easily contained by a simple dressing
- D. All of the above
- E. A&B only

18. Antibiotic therapy that are used to treat presumed or confirmed MRSA infections should be directly observed via pill line

- A. True
- B. False

19. Untreated MRSA infections do not result into life threatening infections

- A. True
- B. False

20. Do you feel that MRSA can pose a risk to yourself?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

21. Do you feel that you are at a greater risk of acquiring MRSA while caring for an infected inmate/detainee?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

22. Do you feel that MRSA is a problem at your correctional facility?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

23. Do you feel that hand-washing frequency should be greater while delivering care to detainees with MRSA?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

24. Do you feel that MRSA can cause a severe infection?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

25. Do you feel that infection control practices help reduce the prevalence of MRSA?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

26. Do you feel that hand washing is the most influential aspect in infection control?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

27. What is an identified barrier to MRSA prevention in the correctional setting for you?

- A. Absence of supplies (gloves, PPE)
- B. Lack of testing for MRSA
- C. Lack of training/education
- D. Lack of teamwork
- E. Decrease number of staff on duty
- F. Other (comment)

28. What is your preferred method for receiving educational information on infection control practices and MRSA prevention?

- A. In-services
- B. Infection control officer
- C. Internet based training
- D. Journal articles
- E. Word of mouth
- F. Other (comment)

29. How confident are you in taking preventive actions to prevent and control MRSA transmission in your facility?

Not At All Confident	Not very Confident	Neutral	Somewhat Confident	Very Confident

## Appendix E: Informed Consent Agreement for Content Validity

**Please read this consent agreement carefully before you decide to participate in the study.**

You are invited to take part in an evidence-based project that will be assessing the healthcare professionals' knowledge and health beliefs about Community Associated Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA). I have developed an original instrument and assessing the content validity of this instrument is a very important process to data collection. I am asking you, the expert, to evaluate how well the survey instrument items represent the content domain of healthcare professionals' knowledge and health beliefs about CA-MRSA. Specifically, you are asked to determine if each question is content relevant, which will also determine if the instrument is valid. Also, another important process of determining if an instrument is valid is evaluating each item for clarity. This will indicate how clear you think each question on the survey is. I have selected you as part of my expert panel because of your extensive knowledge on publication, clinical research, and/or the content being measured.

This study is being conducted by a Deborah Winbush, FNP-C who is a doctoral student at Walden University.

**Purpose of the research study:** The purpose of this study is to develop evidence-based recommendations for improving nurse professionals' adherence to MRSA practice guidelines in a correctional setting. This researcher believes by examining their level of knowledge and health beliefs regarding CA-MRSA prevention and the risk associated with CA-MRSA, the information gathered would be useful in providing insight into the problems in current practice, identify recommendations and educational needs of the healthcare professionals, and reducing barriers.

**What you will do in the study:** You will be evaluating how well each item of the instrument represents the healthcare professionals' level of knowledge and health beliefs about CA-MRSA, the instruments overall validity, and the clarity of each item. You will also be asked to provide feedback or comments that you may feel necessary to improve any question.

**Time Required:** This study will require about thirty minutes of your time to complete the questionnaire. You will be given two weeks to complete the survey.

**Voluntary Participation:** Your participation is completely voluntary.

**Payment:** You will receive no payment or gifts for participating in the evaluation of the Knowledge and Health Beliefs about CA-MRSA Questionnaire.

**Confidentiality:** Your responses to the survey will be kept confidential. I will not use your personal information for any purposes outside of this instrument evaluation.

**Questions about the study:** If you have any questions about the study instrument, you may contact me:

Deborah Winbush, FNP-C  
DNP student  
Walden University

**Statement of Consent:** I have read the above information and I feel I understand my duties well enough to make a decision about my involvement. By clicking the “**I agree to participate**” link below, I understand that I am agreeing to the terms described above. By clicking the “**I do not agree to participate**” link below, I do not agree to the described terms above of the consent form and will no longer be eligible to participate in this evaluation. Please print or save this consent form for your records.

## Appendix F: Permission to Reprint

**WOLTERS KLUWER HEALTH LICENSE  
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Feb 22, 2015

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