

5-2017

Nurse Knowledge, Attitude, and Compliance Related to Methicillin Resistant Staphylococcus aureus

Ellen A. Suss

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The University of Southern Mississippi

Nurse Knowledge, Attitude, and Compliance Related to Methicillin Resistant *Staphylococcus*
aureus

by

Ellen Suss

A Thesis
Submitted to Honors College of
The University of Southern Mississippi
in Partial Fulfillment
of the Requirements for the Degree of Bachelor of Science in Nursing
in the Department of Collaborative Nursing Care

May 2017

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Abstract

The purpose of this study is to determine nurses' knowledge of Methicillin Resistant *Staphylococcus aureus* (MRSA), the attitude they have towards patients with MRSA, and how well they comply with MRSA protocols. Forty-six nurses participated in this study. A questionnaire assessing knowledge, attitude, and compliance was distributed via email to graduates of the University of Southern Mississippi. The survey had three sections to assess each variable, with 17 true/false questions about knowledge, 10 questions about attitude, and 6 questions about compliance. Overall, nurses in this study had adequate knowledge of MRSA, aside from overt lack of knowledge regarding antibiotic treatment. Their attitudes were overall positive. While a large majority of nurses complied with hand hygiene and the wearing of gloves, nurses were lacking in compliance with wearing gowns. With these factors considered, nurses need continuing education about MRSA.

Acknowledgements

I would like to thank my thesis advisor, Dr. Kathleen Masters, for her support and guidance through this process. As a student new to research, I could not have done this without her. I would also like to thank Dr. Michael Forster and Dr. Tim Rehner for their guidance in writing my prospectus. Finally, I would like to thank my family and friends for their constant encouragement and support.

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Chapter 1: The Problem

The spread of infectious disease has been occurring for as long as humans have been documenting medicine, and it is still a current issue today. Although we have moved from plagues and smallpox to the Zika virus and Ebola, the principles of infectious diseases have remained somewhat constant. Even before medical practice became a billion-dollar industry that reached almost every corner of the continent, the aim has been to heal people of the diseases they contracted. Despite our growth and extensive knowledge of pathogens, healthcare professionals still deal with infectious diseases daily, especially within hospitals. In fact, infectious diseases are often even spread throughout hospitals. Patients may come into a healthcare setting with one infection and contract another one while there. This mechanism of infection is called a healthcare acquired infection (HAI), and they are common within hospitals due to the millions of pathogens that are introduced into the setting. Healthcare professionals can be directly responsible for the spread of infection, especially nurses, who spend their entire day going from patient to patient.

The scope of HAIs is extensive, as they occur regularly in every hospital in the nation and worldwide. The Center for Disease Control (CDC) estimates that there were over 721,800 HAIs in American hospitals just in 2011 alone. Of the 722,000 patients impacted, about 75,000 died during their hospitalization. On average an HAI costs a patient anywhere between \$13,973 and \$17,998, depending on the severity of the infection. On a national scale, HAIs cost hospitals from 28.4 to 33.8 billion dollars (“National and State Healthcare Associated Infections Progress Report,” 2016). In a study performed by Glance, it was concluded that acquiring an HAI while in the hospital at least doubles length of stay and increases the risk of mortality by six times (Glance, Stone, Mukamel, & Dick, 2011). Although the rates of HAIs have declined in the past decade due to better technology and awareness, numbers are still lagging. Worldwide, hundreds

of millions of patients are affected by HAIs every year, which is a vast number being that they are, to a point, preventable (“Health care-associated infections fact sheet,” nd.).

While there are many types of HAIs, one of the most common is caused by a methicillin resistant strain of *Staphylococcus aureus* (MRSA). MRSA is responsible for many HAIs due to its virulence and resistant nature. In some patients, MRSA can be serious enough to cause death, and at the least, it can cause painful lesions or sores and a lengthened hospital stay, costing the patient and the hospital resources, time, and money. Because nurses are primary agents in the transmission of MRSA, nurse’s knowledge, attitude, and compliance with safety protocols are necessary to decrease infection rates. Nurses should be well informed on information about MRSA’s rates of transmission. They need to know how to treat MRSA and how to prevent MRSA from infecting a patient in the first place. Without a knowledgeable nurse, pathogens spread more easily and more patients becoming infected with an HAI during their hospital stay. While knowledge enhances the ability nurses have to prevent the spread of MRSA, knowledge alone does not lower MRSA rates. To physically lower the number of patients that contract MRSA while staying in the hospital, actual compliance to a hospital’s MRSA protocols is necessary. Linking knowledge and compliance is essential, because they enhance each other to create an environment in which infection of MRSA is less of an issue. A third factor also influences both of the ideas previously introduced: a nurse’s attitude towards MRSA. A nurse’s attitude can both enhance or hinder their openness to gaining knowledge and their willingness to comply with protocols. These three variables together greatly influence MRSA rates in hospitals.

The variables of knowledge, attitude, and compliance are extensively interconnected and of equal importance in preventing the spread of MRSA of hospitals. It is essential for a nurse to exhibit positive habits in all three areas, as lacking in one area can create environment in which

MRSA transmission may transpire. While the factors of knowledge, attitude, and compliance alone are important, tying them together creates a strong and balanced foundation upon which nurses can build their care. Assessing nurses' knowledge, attitude, and compliance will provide a greater understanding of the trends and commonalities for the general nursing population. Obtaining knowledge of nurses' strengths and weaknesses in these categories will shed light on how nurses contribute to the spread of MRSA within hospitals. With the data obtained, areas of weakness can be targeted and additional education can be provided in order to strengthen nurses' infection practices. If infection transmission could be targeted during nurses' education before they even reach the hospital, it may aid hospitals in lowering their MRSA rates. To collectively evaluate these factors, the question "What are nurses' knowledge, attitude, and compliance regarding methicillin-resistant *Staphylococcus aureus*?" will be explored.

Chapter 2: Literature Review

The topic of methicillin resistant *Staphylococcus aureus* is one that has not been ignored in the literature. MRSA is a common issue in hospitals across the world, meaning it is beginning to be heavily studied by researchers worldwide. However, because MRSA is still not on the list of the top three most common healthcare acquired infections, there are still areas that have not been adequately researched. From a nursing standpoint, it is important to study the pathogen, yet it is arguably more important to study the interactions that nurses have with it. The research for this study focuses on nurses' knowledge, attitude, and compliance regarding MRSA, in hopes that gathering more important information that will help to lower MRSA rates in hospitals.

Knowledge

The scientific knowledge that healthcare professionals have on the topic of MRSA abounds. Many research articles survey healthcare professionals (nurses, physicians, surgeons, etc.), compare knowledge levels of the varying groups, and have determined in which areas healthcare professionals are lacking knowledge.

In the study performed by author Silva in 2010, 43.7% of the healthcare professionals surveyed did not know the foundational information regarding *S. aureus*' resistance to MRSA. In a different study regarding nurse's knowledge, Munro and Grap collected similar results. Ninety nurses responded to a questionnaire focused on knowledge, and the author reported that 53.8% of the nurses got at least half of the questions incorrect. This lack of knowledge about antibiotics is a common theme in many of the studies reviewed (Munro & Grap, 2001; "A study of senior staff nurses' perceptions about MRSA," 2006; Mamhidir, Lindberg, Larsson, Fläckman, & Engström, 2011). Not a single study stated that nurses had sufficient knowledge of MRSA and its relation to antibiotics. Many nurses reported feeling uncomfortable in general with antibiotics, which is

important to note, as MRSA is perpetuated by its resistance to antibiotics and the over-prescription and misuse of antibiotics (Munro & Grap, 2001).

While the knowledge of antibiotics is generally lacking, other knowledge studies concluded that nurses' knowledge of hand hygiene was overall sufficient. In the study performed by Paudyal, researchers determined that 99% of their healthcare workers knew of proper hand washing practice, 92% were familiar with methods of transmission, and 97% knew that wearing gloves, masks, and aprons, reduced cross contamination. Mamhidir's research in 2011 mirrors Paudyal's results, suggesting that nurses had a solid understanding that washing hands and wearing protective clothing prevented the spread of pathogens, such as MRSA, from one site to another and between patients (Mamhidir et al., 2011). In another study, nurses were also able to correctly identify that hand decontamination was the number one method of MRSA transmission (Lugg & Ahmed, 2008). However, there was one study performed by researcher Slyne in 2012 that found knowledge of hand hygiene and protective equipment was alarmingly low with less than half of the nurses correctly answering knowledge based questions on these two topics (Slyne, Phillips, & Parkes, 2012). This inconsistency signals that knowledge varies greatly from hospital to hospital.

Almost all of the research projects read had high percentages for nurses' knowledge of very basic methods of prevention for MRSA, although when the questions got more detailed the number that answered correctly began to drop. For example, while nurses knew the basic principles for preventing MRSA infection, in Easton's research study from 2007, 74% of the nurses failed to identify the two most common sites of MRSA infection (Easton et al., 2007). Many healthcare workers were more than capable of recognizing information that was presented to them daily (such as proper hand hygiene to prevent the spread of MRSA and other pathogens),

yet they were unable to answer questions correctly when they were less general and more focused directly on MRSA.

Research that surveys just nurses on basic knowledge of MRSA has not been located. Most of the studies survey a variety of healthcare professionals; including doctors, surgeons, and other hospital staff. The knowledge studies primarily are performed outside of the United States in European or Middle Eastern countries, and a study focusing on the nurses in the Southern areas of the United States has not been found.

Attitude

In many studies reviewed, nurses had mixed attitudes about MRSA and patients infected with MRSA. In general, nurses were more fearful of patients with MRSA. In Paudyal's study, nurses were fearful of becoming infected. In addition to being more fearful, a majority of the nurses believed that the infected patients should only be treated at specialist centers. In a study written by Dr. Seibert, more than 90% of the participants agreed that MRSA was a problem in the United States, but less than half of them recognized it as a problem in their own hospital (Seibert, Speroni, Oh, DeVoe, & Jacobsen, 2014a). This idea is reflected in many of the studies reviewed. It appears that in general, nurses recognize MRSA as a problem, yet they do not see it as something they have an ability to control.

Silva's research study highlighted that 12.8% of the healthcare professionals surveyed were fearful of contracting MRSA from infected patients and transmitting it to friends or family members, and Seibert's research also reports this fear, stating that about half of the participants caring for MRSA patients worry about introducing the infection to their homes.

In another study that surveyed healthcare workers, author Trigg and his research team concluded that doctors were the only healthcare workers that felt well educated on MRSA

protocols (Trigg, Timmons, & Pynegar, 2008). A lack of education was a common theme in many of the studies that survey nurses about their perceptions of MRSA. Many nurses reported feeling undereducated, and they also reported a lack of communication of MRSA throughout the hospital. Despite some negative feelings towards MRSA, one study was reviewed where 77% of the healthcare professionals were found to have a positive attitude, although they did believe that having a patient with MRSA makes their job more difficult (Phillips, Golagani, Malik, & Payne, 2010).

Compliance

While specific protocols regarding infection control vary throughout hospitals, the most general protocols fall under standard precautions. Standard precautions cover topics such as hand hygiene, use of personal protective equipment, and safe use and proper disposal of sharps. Standard precautions are used to ensure that hospital staff follows a basic set of protocols when handling any infectious disease. For example, standard precautions mandate that healthcare professionals should decontaminate hands before and after any direct contact with a patient, after exposure to body fluids, and immediately after removing gloves. The standard precautions include the proper steps for washing hands and when it is appropriate to use an alcohol based rub instead of soap and water. For personal protective equipment, the standard precautions state that gloves should be worn during any contact with bodily fluids, mucous membranes, or non-intact skin and aprons should be used if there is risk of exposure to bodily fluids and that face masks and eye protection must be worn if there is a risk of the patient's bodily fluids splashing. The standard precaution protocols apply to any patient infected with MRSA and should be complied with in order to lower the risk of spreading MRSA (Pellowe & Mulhall, n.d.).

Compliance with hand hygiene varied throughout the studies reviewed. In the research conducted by Seibert, 88.6% of nurses reported washing their hands after touching a patient. While this number is high, it still implies that 12.4% of nurses in that hospital are not washing their hands after touching patients (Seibert et al., 2014a). While Seibert's research yielded adequate results, Paudyal's research showed poorer compliance rates. In Paudyal's study, only 56% reported washing their hands before and after patient examination, and only one healthcare worker reported compliance in all expected categories (Paudyal, Simkhada, & Bruce, 2008). Another study that provided data on compliance found that compliance with both hand hygiene and the use of personal protective equipment was adequate. However, it was noted that nurses did not comply with protocols for disposing of waste and linen after caring for a patient with MRSA (Slyne et al., 2012). Lugg's research showed similar results, with 70.5% of nurses reporting the use of personal protective equipment. Again, while these numbers are high, they still highlight that a small percent of healthcare workers put themselves and their patients at risk for MRSA contamination by not following protocols. In most of the studies reviewed, 10-30% of nurses reported noncompliance with their varying hospital protocols. While the studies generally showed that a large percentage follow protocols, some of the studies reviewed reported extremely low numbers. In Silva's research study, only 35 of the 318 professionals surveyed reported using contact precautions while caring for patients with MRSA, which is 11%. Contact precautions are recommended for healthcare workers treating patients with MRSA and have proven to lower transmission rates when practiced. Numbers this low suggest that, in some hospitals, compliance is low enough to create a serious risk for MRSA transmission.

Some studies asked that researchers identify what they view as the reasons for noncompliance in their hospital. In one study, nurses identified the main barriers as equipment

and environmental issues, time restraints, and influence of other healthcare workers. These nurses also reported a lack of communication as an issue. They felt that it was poorly communicated which patients had MRSA and that the protocols were not always clear (Seibert, Speroni, Oh, DeVoe, & Jacobsen, 2014b). In the study that surveyed ten senior nurses, many of them reported feeling that compliance was an issue, but they put blame on physicians, stating that physicians are the ones guilty of noncompliance (“A study of senior staff nurses’ perceptions about MRSA,” 2006).

Chapter Three: Methods

Instrumentation

The three variables explored were knowledge, attitude, and compliance. The goal of the research was to see how nurses score in each of these three categories. A questionnaire to measure these three variables was created by combining three different questionnaires that focus on each individual variable. Knowledge was assessed using a questionnaire that modified current questionnaires related to the nurses' knowledge using a true/false section with "unsure" as a third answer choice. The attitude section was assessed using a Likert scale. The compliance section gave respondents the choice of always, sometimes, and never to self-reflect on their own and peers' adherence to protocols regarding the care of patients with MRSA. A brief demographic section was also included.

Sample

The sample was composed of graduates from the University of Southern Mississippi's (USM) Nursing program that included both undergraduate and graduate programs. The convenience sample was accessed through the USM College of Nursing alumni listserv. The sample was comprised of both male and female nurses who worked in various settings for varying amounts of time. Participation in this study required that all participants be at least 18 years of age, be able to read the English language, and have experience as a registered nurse in a hospital setting.

The University of Southern Mississippi Internal Review Board (IRB) approved this study. Consent to participate in the study was voluntary and consent to participate was assumed with completion and submission of the research instrument. Participants remained anonymous

and were informed that they could withdraw from the study at any time prior to submission of the questionnaire.

Procedures

To reach respondents, a link to the questionnaire created with Qualtrics was emailed via the USM College of Nursing alumni listserv. The email also included a word document explaining the project and guidelines for participation in the study. After respondents completed the questionnaire, the data gathered from each individual question was analyzed using the Qualtrics software. Overall scores helped to determine specific areas in which nurses were lacking in knowledge, had negative attitudes toward patients with MRSA, or were not following hygienic procedures. The survey was sent on October 19, 2016 and responses were no longer accepted after February 13, 2017.

Chapter 4: Results

Demographics

The questionnaire to determine nurses' knowledge, attitude, and compliance of MRSA was sent out to USM College of Nursing alumni. The questionnaire was sent to 683 BSN graduates. A total of 46 questionnaires were completed. Of the completed questionnaires, 9 were males and 37 were females. 86.96% of the respondents had 0-5 years of experience. 2.17% had 6-10 years of experience, 4.35% had 11-15 years, 2.17% had 16-20 years, and 4.35% had 20+ years. The nurses worked in a variety of settings. 45.65% worked in acute care, 4.35% worked in outpatient care, 39.13% worked in inpatient care, 2.17% worked in home health, and 8.70% selected "other" to describe their work setting. All of the respondents obtained their BSN degree at USM.

Table 1

Demographic Data

<i>Demographic</i>	<i>Categories</i>	<i>Nurses (%)</i>
Gender	Male	19.57%
	Female	80.43%
Years as an RN	0-5	86.96%
	6-10	2.17%
	11-15	4.35%
	16-20	2.17%
	20+	4.35%
Current work setting	Acute care	45.65%
	Outpatient	4.35%
	Inpatient	39.13%
	Home Health	2.17%
	Other	8.70%

Knowledge

The nurses were relatively strong in their general knowledge of MRSA. Of the nurses, 68.89% correctly identified MRSA as a gram-positive coccus. A majority of the respondents (93.99%) knew that hand hygiene is effective in preventing the spread of MRSA, and 90.91% knew that the statement stating the MRSA is rarely transmitted via the hands of healthcare workers was incorrect. Most of the respondents (93.33%) correctly identified that gloves should be worn when examining a patient with MRSA. A majority of the nurses (84.44%) were also able to recognize that MRSA bacteremia requires treatment even if asymptomatic. Only 42.22% of nurses were able to recognize that MRSA nasal carriers should not be treated with nasal antiseptics. Almost half of the respondents (48.84%) incorrectly believed that alcohol hand gel was not as effective as hand washing in reducing MRSA transmission. Of the respondents, 44.44% correctly responded that MRSA nasal carriers should be treated with nasal antibiotics. Only 44.44% nurses correctly stated that a patient with MRSA infection or colonization should be discharged home promptly if medically fit for discharge. A majority of the nurses (69.77%) were able to correctly identify that a patient with a MRSA infection or colonization can be transferred to another hospital or nursing home for good clinical reasons. A vast majority (91.11%) were also able to identify that a MRSA wound infection still requires treatment even if asymptomatic. Only 33.33% of the nurses were able to identify that MRSA skin carriage should be treated with topical or oral antibiotics, and only 35.56 knew that MRSA bacteremia should not be treated with Tazocin, with 51.16% of the nurses selecting that they were unsure. A majority of the respondents (90.70%) were able to identify that MRSA wound infection should be treated with intravenous or oral antibiotics depending on the clinical picture. More than half of the respondents (57.14%) correctly stated that MRSA skin carriage should be managed with

antiseptic solution (chlorhexidine) for body wash. A minority (30.23%) of the respondents correctly stated that MRSA bacteremia should be treated with oral rifampicin (rifampin) if the infection is mild, with 48.84% marking that they were unsure. Only 37.78 of the nurses correctly stated that a patient with MRSA infection or colonization can be discharged home before eradication.

Table 2

Knowledge

Question	Correct Answer	True	False	Unsure
MRSA is a Gram-positive coccus.	True	68.89%	15.56%	15.56%
Hand hygiene is not effective in preventing MRSA spread.	False	2.22%	93.33%	4.44%
MRSA is rarely transmitted via the hands of healthcare workers.	False	6.82%	90.91%	2.27%
Gloves should be worn when examining patients with MRSA.	True	93.33%	4.44%	2.22%
MRSA bacteraemia does not require treatment if asymptomatic.	False	4.44%	84.44%	11.11%
MRSA nasal carriers should be treated with nasal antiseptics.	False	33.33%	42.22%	24.44%
Alcohol hand gel is as effective as hand washing in reducing MRSA transmission.	True	42.22%	48.89%	8.89%
MRSA nasal carriage should be treated with nasal antibiotics.	True	44.44%	44.44%	11.11%
A patient with MRSA infection or colonization should be discharged home promptly if medically fit for discharge.	True	44.44%	46.67%	8.89%
A patient with MRSA infection/colonization can be transferred to another hospital or nursing home for good clinical reasons.	True	68.89%	24.44%	6.67%
MRSA wound infection requires no treatment if asymptomatic.	False	4.44%	91.11%	4.44%
MRSA skin carriage should be treated with topical or oral antibiotics.	False	55.56%	33.33%	11.11%

MRSA bacteraemia should be treated with Tazocin.	False	13.33%	35.56%	51.11%
MRSA wound infection should be treated with intravenous or oral antibiotics depending on the clinical picture.	True	91.11%	6.67%	2.22%
MRSA skin carriage should be managed with antiseptic solution (chlorhexidene) for body wash.	True	56.82%	18.18%	25.00%
MRSA bacteraemia should be treated with oral rifampicin (rifampin) if mild infection.	False	20.00%	31.11%	48.89%
A patient with MRSA infection or colonization should not be discharged home before infection/colonization eradication.	False	44.44%	37.78%	17.78%

Attitude

The second category of questions asked nurses of their opinions and attitudes toward MRSA. When asked if they believed that MRSA was a national problem, 37.78% of the nurses highly agreed, 44.44% agreed, 6.67% were neutral, 6.98% disagreed, and 4.44% highly disagreed. When asked if MRSA was a problem in their specific place of work, 26.67% highly agreed, 40.00% agreed, 24.44% were neutral, 8.89% disagreed, no nurses stated that they highly disagreed with this statement. Of the nurses, 11.11% highly agreed with the statement that people colonized with MRSA are a danger to everyone they come into contact with, while 22.22% agreed, 24.44% were neutral, 35.56% disagreed, and 6.67% highly disagreed with this statement. When responding to the statement that a post-operative patient with an open wound infected with MRSA is a burden to hospital staff caring for them, 6.67% of nurses highly agreed, 8.89% agreed, 13.33% were neutral, 57.78% disagreed, and 13.33% highly disagreed. When asked if they believed that patients colonized with MRSA probably have poor hygiene, 8.89% of the respondents agreed, 8.89% of them were neutral, 44.44% disagreed, and 20.00% highly disagreed. Less than half of nurses (20.00%) highly disagreed that a patient with a MRSA

infected wound should be nursed in a side ward, while 40.00% disagreed, 17.78 were neutral, 20.00% agreed, and 2.22% highly agreed. The majority of respondents (51.11%) disagreed that the hospital staff should spend as letter time as possible with patient with MRSA infection. 26.67% highly disagreed, 6.67% were neutral, 11.11% agreed, and 4.44% highly agreed. When responding to the statement that a patient with a MRSA infection does not make their jobs any more difficult, 6.67% highly disagreed, 24.44% disagreed, 22.22% were neutral, 35.56% agreed, and 11.11% highly agreed. A majority of the respondents (48.89) disagreed that one patient in their care with a MRSA infected wound takes up more of the nurses' time to the detriment of their other patients. To this same statement, 17.78% highly disagreed, 20.00% were neutral, 13.33% agreed, and no nurses highly agreed. When asked if a patient being cared for in a side room due to MRSA infection should be allowed to use the bath/showed on the ward, 11.11% highly disagreed, 48.89% disagreed, 26.67% were neutral, 11.11% agreed, and 2.22% highly agreed. A majority of nurses (64.44%) disagreed that a patient with a MRSA infected wound should not be allowed visitors, while 26.67% highly disagreed, 4.44% were neutral, 4.44% agreed, and none highly agreed. Finally, when asked if they have received meaningful education regarding MRSA, 6.67% of nurses highly disagreed, 6.67% disagreed, 26.67% were neutral, 48.89% agreed, and 11.1% highly agreed.

Table 3

Attitude

Question	Highly Disagree	Disagree	Neutral	Agree	Highly Agree
MRSA is a national problem.	4.44%	6.67%	6.67%	44.44%	37.78%
MRSA is a problem in this hospital.	0.00%	8.89%	24.44%	40.00%	26.67%

People colonized with MRSA are a danger to everyone they come into contact with.	6.67%	35.56%	24.44%	22.22%	11.11%
A post-operative patient with an open wound infected with MRSA is a burden to hospital staff caring for them.	13.33%	57.78%	13.33%	8.89%	6.67%
Patients colonized with MRSA probably have poor personal hygiene.	37.78%	44.44%	8.89%	8.89%	0.00%
A patient with a MRSA infected wound should be nursed in a side ward.	20.00%	40.00%	17.78%	20.00%	2.22%
Hospital staff should spend as little time as possible with patients with MRSA infection.	26.67%	51.11%	6.67%	11.11%	4.44%
A patient with a MRSA infected wound does not make my job any more difficult.	6.67%	24.44%	22.22%	35.56%	11.11%
One patient in my care with a MRSA infected wound takes up more of my time to the detriment of my other patients.	17.78%	48.89%	20.00%	13.33%	0.00%
A patient being cared for in a side room due to MRSA infection should be allowed to use the bath/shower on the ward.	11.11%	48.89%	26.67%	11.11%	2.22%
A patient with a MRSA infected wound should not be allowed visitors.	26.67%	64.44%	4.44%	4.44%	0.00%
I have received meaningful education regarding MRSA.	6.67%	6.67%	26.67%	48.89%	11.11%

Self-Compliance

The third and final section of the questionnaire included questions about compliance in which the nurses' answered for themselves and their peers. When answering for themselves, a majority of nurses (71.11%) stated that they always wear gloves when entering a MRSA

isolation room. 20.00% responded that they wear gloves very often, 4.44% responded sometimes, 2.22% responded rarely, and 2.22% responded never. Almost half of the nurses (46.67%) responded that they always wear a gown when entering a MRSA isolation room, 20.00% responded very often, 15.56% responded sometimes, 8.89% responded rarely, and 8.89% responded never. When asked if they perform hand hygiene before and after touching a patient with a MRSA infection, 44.44% responded always, 31.11% responded very often, 13.33% responded sometimes, 8.89% responded rarely, and 2.22% responded never.

Table 4

Self-Compliance

Question	Never	Rarely	Sometimes	Very Often	Always
I wear gloves when entering a MRSA isolation room.	2.22%	2.22%	4.44%	20.00%	71.11%
I wear a gown when entering a MRSA isolation room.	8.89%	8.89%	15.56%	20.00%	46.67%
I perform hand hygiene before and after touching a patient with a MRSA infection.	2.22%	6.67%	0.00%	6.67%	84.44%

Peer Compliance

The third category of questions also included statements that required respondents to reflect on their peers' compliance to MRSA protocols. More than half of the nurses (62.22%) responded that their peers always wear gloves when entering a MRSA isolation room, 35.56% responded very often, none responded sometimes, 2.22% responded rarely, and none responded never. When asked if their peers wear a gown when entering a MRSA isolation room, 44.44% responded always, 31.11% responded very often, 13.33% responded sometimes, 8.89%

responded rarely, and 2.22% responded never. A majority of the nurses (66.67%) responded that their peers always perform hand hygiene before and after touching a patient with a MRSA infection. Almost a fourth (24.44%) responded very often, none responded sometimes, 4.44% responded rarely, and 4.44% responded never.

Table 5

Peer Compliance

Question	Never	Rarely	Sometimes	Very Often	Always
My peers wear gloves when entering a MRSA isolation room.	0.00%	2.22%	0.00%	35.56%	62.22%
My peers wear gowns when entering a MRSA isolation room.	2.22%	8.89%	13.33%	31.11%	44.44%
My peers perform hand hygiene before and after touching a patient with a MRSA infection.	4.44%	4.44%	0.00%	24.44%	66.67%

Chapter 5: Discussion

Areas of Strength and Knowledge Deficits

The purpose of this study was to gain an in-depth insight into how knowledgeable nurses are about MRSA, how they feel about and treat patients that have a MRSA infection, and how well they adhere to protocols that reduce the spread of MRSA. Overall, nurses had average knowledge of MRSA and its properties. Of 17 questions, a majority of the nurses answered correctly on 9 questions. Almost all of the nurses were able to identify that healthcare workers are often the ones that spread MRSA from patient to patient, so the wearing of gloves when examining patients with MRSA and hand hygiene are necessary. Although a majority of nurses answered these questions correctly, it is notable that some still answered those questions incorrectly. All nurses should know that gloves need to be worn when examining patients with MRSA and that MRSA is frequently transmitted via the hands of healthcare workers. While only five nurses answered this incorrectly, that number is still unacceptable. Nurses seemed to struggle the most with questions about treatment. Of the nine questions about treatment of MRSA, a majority of nurses incorrectly answered five of them. Nurses were unable to answer questions correctly about specific types of treatment, such as treating MRSA bacteremia with oral rifampicin. These findings correspond to the findings of the literature review; nurses' knowledge of antibiotic treatment of MRSA is lacking. Although nurses are not responsible for prescribing antibiotic treatment of MRSA, it is still essential that they understand the reasons they are giving specific medications so that expected outcomes can be evaluated. Misuse of antibiotics contributes to antibiotic resistance, so the knowledge deficit here should be addressed.

Attitude Towards Patients with MRSA

Nurses' attitudes toward patients with MRSA were overall more positive than those summarized in the literature review. Nurses in this study were less likely to feel that patients with MRSA were a burden to them, probably had poor personal hygiene, or took up more of their time to the detriment of other patients. A majority of the nurses agreed that a patient with MRSA should be allowed visitors. In contrast to Seibert's study, the nurses in this study both agreed that MRSA is a problem nationally and within their hospital. These nurses were able to recognize that MRSA is not only causing deaths nationally, but that it also directly applies to them and their daily practice. Nurses in this study also differed from those in the literature review because 60% of them agreed or highly agreed that they have received meaningful education regarding MRSA. This education may account for the increased knowledge levels and higher levels of compliance. Similar to the study performed by Phillips, almost half of the nurses in this study agreed that having a patient with MRSA makes their job more difficult. Aside from this question, most of the nurses did not show negative bias toward patients with MRSA.

Compliance to MRSA Protocols

Overall, a majority of nurses were compliant to MRSA protocols and judged their peers as being compliant as well. A majority stated that both they and their peers always wear gloves when entering a MRSA isolation room, which is in compliance with standard precautions. Another, smaller percent said neither they nor their peers wear gloves very often. It would be ideal to have these nurses comply always, but what is more concerning is the small percentage that stated they or their peers sometimes, rarely, or never wear gloves when entering a MRSA compliance room. This behavior contributes to the spread of MRSA, as MRSA is frequently spread via the hands of healthcare workers (Seaton & Montazeri, 2006). Of hand washing, wearing a gown, and wearing gloves, the nurses were least compliant to wearing a gown when

entering a MRSA isolation room. While a majority of nurses stated that they and their peers wore a gown always or very often, 33.34% stated they sometimes, rarely, or never wear a gown when entering a MRSA room and 24.44% stated that of their peers. When entering a MRSA isolation room, nurses should wear a gown to prevent contracting MRSA on clothing or arms. This data suggests that there is a need to review the importance of gowning along with gloving, because hands are not the only way the MRSA can be spread via the healthcare professional. This information may need to be stressed more in nurse education. A majority of nurses also stated that they and their peers always perform hand hygiene before and after touching patients with MRSA. Hand hygiene is one of the most effective ways to prevent MRSA spread; thus, every healthcare professional should wash their hands diligently before and after touching a patient with MRSA. Even washing the hands “very often” after touching a patient with MRSA is not enough, as it only takes one time to spread bacteria with contaminated hands. Although it is a small percentage, 8.89% of the nurses said they rarely or never perform hand hygiene before and after touching a patient with MRSA and 8.88% stated the same of their peers. Every healthcare professional, especially nurses, should know that hand hygiene after touching a patient with MRSA is essential to prevent the spread of infection.

These compliance results were similar to studies previously reviewed. It seems to be a common trend that a majority of nurses adhere to standard precautions; however, a minority do not adhere to proper policies. This study had better compliance results than Silva and Paudyal’s studies, which may indicate that teaching is becoming more affective. These better results may in part be attributed to the larger percentage of nurses that feel they have received meaningful MRSA education. In each of the compliance sections, the self-compliance category of “always”

had a higher percentage than the peer-compliance, suggesting that nurses generally believe that their own compliance is superior to that of their peers.

Limitations

There were some limitations to the study. The first limitation is that the nurses sampled all received their education in nursing from the same university. The convenience sample selected may not be an accurate representation of the nursing population as a whole. Those that responded to the survey were a majority of new nurses, with 76% of the respondents selecting that they had been in the workforce for 5 years or less. This also does not accurately represent the general population of nurses, as the population is comprised of nurses with varying years of experience. Another limitation of this study is the low response rate. A group of forty-five nurses is a very small percentage of the entire nursing population. In addition to these limitations, the true/false section may not have accurately depicted knowledge. While “unsure” was an option and nurses were asked not to guess, they had a 50% chance of getting the question right by guessing true or false, potentially skewing the data.

Further Areas of Study

This study examined specific areas in which nurses were lacking knowledge, as well as their attitude towards patients with MRSA and how well they comply with MRSA protocols. These three variables are dependent upon each other, and each could be further assessed to determine their relationship. The trend that nurses seem to have a weaker knowledge of antibiotic treatment could be further assessed, as knowledge deficit of antibiotics contributes to antibiotic resistance. While education is suggested to improve these areas, further studies could determine which types of education are most meaningful and effective. Strategies to improve attitude and compliance could be investigated as well.

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Appendix A

Adapted Questionnaire for Knowledge, Attitude, and Compliance
Compiled from Phillips, Seaton and Montezari, and Seibert

Knowledge

MRSA is a Gram-positive coccus	True	False
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Hand hygiene is not effective in preventing MRSA spread	True	False
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MRSA is rarely transmitted via the hands of healthcare workers	True	False
--	------	-------

Gloves should be worn when examining patients with MRSA	True	False
---	------	-------

MRSA bacteremia does not require treatment if asymptomatic	True	False
--	------	-------

MRSA nasal carriers should be treated with nasal antiseptics	True	False
--	------	-------

Alcohol hand gel is at least as effective as hand washing in reducing MRSA transmission	True	False
---	------	-------

MRSA nasal carriage should be treated with nasal antibiotics	True	False
--	------	-------

A patient with MRSA infection or colonization should be discharged home promptly if medically fit for discharge	True	False
---	------	-------

A patient with MRSA infection/colonization can be transferred to another hospital or nursing home for good clinical reasons	True	False
---	------	-------

MRSA wound infection requires no treatment if asymptomatic	True	False
--	------	-------

MRSA skin carriage should be treated with topical or oral antibiotics	True	False
---	------	-------

MRSA bacteremia should be treated with Tazocin	True	False
--	------	-------

MRSA wound infection should be treated with intravenous or oral antibiotics depending on the clinical picture	True	False
---	------	-------

MRSA skin carriage should be managed with antiseptic solution (chlorhexidene) for body wash	True	False
---	------	-------

MRSA bacteremia should be treated with oral rifampicin if mild infection	True	False
--	------	-------

A patient with MRSA infection or colonization should not be discharged home before infection/colonization eradication	True	False
---	------	-------

Attitude

People colonized with MRSA are a danger to everyone they come into contact with	1	2	3	4	5
A post-operative patient with an open wound infected with MRSA is a burden to hospital staff caring for them	1	2	3	4	5
Patients colonized with MRSA probably have poor personal hygiene	1	2	3	4	5
A patient with a MRSA infected wound should be nursed in a side ward	1	2	3	4	5
Hospital staff should spend as little time as possible with patients with MRSA infection	1	2	3	4	5
A patient with a MRSA infected wound does not make my job any more difficult	1	2	3	4	5
Patients infected with MRSA should receive the basic medical care they need, but not additional services such as physiotherapy	1	2	3	4	5
One patient in my care with a MRSA infected wound takes up more of my time to the detriment of my other patients	1	2	3	4	5
A patient being cared for in a side room due to MRSA infection should be allowed to use the bath/showers on the ward	1	2	3	4	5
A patient with a MRSA infected wound should not be allowed visitors	1	2	3	4	5

Compliance

I consistently wear gloves when entering a MRSA isolation room	Never	Sometimes	Always
My peers consistently wear gloves when entering a MRSA isolation room	Never	Sometimes	Always
I consistently wear a gown when entering a MRSA isolation room	Never	Sometimes	Always
My peers consistently wear gowns when entering a MRSA isolation room	Never	Sometimes	Always
I consistently perform hand hygiene before and after touching a patient with a MRSA infection	Never	Sometimes	Always
My peers consistently perform hand hygiene before and after touching a patient with a MRSA infection	Never	Sometimes	Always

Appendix B



THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD

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Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 16091202

PROJECT TITLE: Nurses' Knowledge, Attitude, and Compliance related to Methicillin Resistant *Staphylococcus aureus* in the Hospital Setting

PROJECT TYPE: New Project

RESEARCHER(S): Ellen Suss

COLLEGE/DIVISION: College of Nursing

DEPARTMENT: Collaborative Nursing Care

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Exempt Review Approval

PERIOD OF APPROVAL: 10/6/2016 to 10/05/2017

Lawrence A. Hosman, Ph.D.

Institutional Review Board

Appendix C

Dear Sir or Madam,

My name is Ellen Suss, and I am a senior Nursing Major at The University of Southern Mississippi. I am working towards graduating with honors and have begun the research for my honors thesis. My research is focused on Nurses' Knowledge, Attitude, and Compliance related to Methicillin Resistant Staphylococcus aureus (MRSA) in the hospital setting.

Thank you in advance for your interest in this study. By participating you are helping gain information about the relationship between nurses' knowledge, attitude, and compliance related to MRSA and how these variables can relate to nosocomial MRSA rates. In order to be eligible for this study you must be older than 18 years of age, be able to read the English language, and be a registered nurse who has experience working in a hospital setting.

Your participation in this survey is anonymous and voluntary. Your identity will remain unknown to the researcher and for the purposes of this study your survey will be identified based on ID number only and will not be associated with you as an individual.

All key personnel that have designed and will conduct this research have gone through education on human subjects research. There is no foreseeable risk to you during participation in this research study; however, even if you begin the survey you may withdraw from the study at any time prior to the actual submission of the survey.

This research has been reviewed by the USM Institutional Review Board and ensures the research projects follows federal regulation in regards to human subjects. For any questions regarding the rights as a participant contact the Chair of the Institutional Review Board at 601-266-5997. The IRB approval number for this study is 16091202.

Please answer the questions to the best of your ability. For any questions regarding the research contact me.

Thank you,

Ellen Suss

Ellen.suss@usm.edu

Please follow this link to access the survey:

https://usmuw.co1.qualtrics.com/SE/?SID=SV_0whmV8IurSMY2i1