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How Covid-19 Has Affected the Hand Hygiene Habits of Healthcare Majors and Non-Healthcare Majors

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Chapter I

Origin of the Problem

The rates of infections in hospitalized patients due to contact with bacteria during a visit or stay at a healthcare facility is increasing. The Center for Disease Control and Prevention (CDC) issued a survey that concluded approximately 1 in 31 hospitalized patients have one, if not multiple, healthcare-associated infections (Center for Disease Control and Prevention, 2018). This rate of infection is classified as a patient safety issue by The Joint Commission (Potter et al., 2017). Hand hygiene is one of the most important infection control methods. The most common way bacteria spreads is via contact with hands which have not been properly washed since coming in contact with a form of bacteria. It is important and hygiene be used in all aspects of life, not just in healthcare settings. Hand hygiene is one of the easiest and most effective ways to prevent the spread of infection (Potter et al., 2017).

Menehan (2020) states that hands have the ability to transport and host microorganisms and that proper hand hygiene should be prioritized. Microorganisms can be found in hosts such as humans, water, food, animals, and insects. When a person comes in contact with a host, microorganisms transfer to the person's skin. Once the microorganisms transfer to a person's hands, the organisms can spread to any surface the person touches, including other humans. Performing hand hygiene minimizes the spread of microorganisms by humans (Menehan, 2020).

Hand hygiene is arguably the most important step in preventing the spread of infections. Without hand hygiene, bacteria can easily spread person to person. The absence of hand hygiene creates an increased risk of spreading disease within homes and communities. The risk of spreading disease decreases significantly with the act of performing hand hygiene regularly.

Observations

With the Covid-19 pandemic, the student researcher has observed the frequency of hand hygiene amongst students increase. Students are using hand sanitizer stations placed in high traffic areas around the college campus. The number of hand sanitizer stations on campus has increased. The student researcher has observed students use the sanitizer stations when they walk by them on campus.

The Covid-19 pandemic has also had an effect on hand hygiene within healthcare facilities. The student researcher has observed healthcare workers perform hand hygiene when exiting patient care areas. The student researcher has also observed healthcare employees and visitors in the facility use sanitizing stations placed in high traffic areas around the hospital or clinic.

Nursing Theory

Florence Nightingale's Environment Theory highlights the importance of good hygiene in preventing the spread of infection. Hand hygiene is one primary way that Nightingale states prevents the spread of infection between people. While providing nursing care during a war,

Nightingale observed a correlation between poor environmental conditions and individuals who died. The environmental theory also discusses the importance of a sanitary environment to provide care in. Performing proper hand hygiene is a major way that a nurse and other healthcare workers work to provide an ideal environment for patient care (Petiprin, 2020).

Nightingale emphasizes the importance of well-ventilated areas for patient care in her environmental theory. Illness is more easily spread in poorly ventilated areas. It is also easier for bacteria to grow in wounds when the care area is not properly ventilated. In addition to proper ventilation, Nightingale also believes clean linens are important for patients. Nightingale believed patients who spent long periods of time in bed deposit bacteria in the sheets which prevents the patient's condition from improving. The environmental theory shows the correlation of the cleanliness of patient care areas and positive outcomes for patients (Karim, 2015).

Significance of the Problem

People are regularly affected by common bacteria and other forms of infection. The best way to combat these infections is to regularly perform proper hand hygiene. Individuals who do not perform hand hygiene on a regular basis are shown to have a higher rate of infection with viral illnesses. One study shows that "handwashing after use of the restroom in most populations averages about 60% or less, even in health care settings" (Taylor et al., 2010). Individuals who understand the benefits of proper hand hygiene are more likely to perform hand hygiene regularly (Taylor et al., 2010).

"Handwashing removes microorganisms from the hands and prevents their transfer through different media, such as foods, beverages, and inanimate objects" (Sharma et al., 2021). Hand hygiene protects oneself and others from infection. Frequent handwashing is a cheap and simple method to prevent the spread of communicable diseases. The current Covid-19 pandemic has reinforced the importance of regularly performing hand hygiene. Healthcare students receive education on the importance of hand hygiene in preventing the spread of infection. Hand hygiene education should be provided to non-healthcare students as well. Missing this education causes non-healthcare students to not understand how crucial hand hygiene is, especially during a pandemic. While non-healthcare students may not enter a clinical setting, it is still important for these students to protect themselves and others from preventable infections (Sharma et al., 2021).

Problem Statement

Has Covid-19 influenced the hand hygiene habits of healthcare majors differently than non-healthcare majors?

Purpose Statement

The purpose of this study is to identify if Covid-19 affected the hand hygiene habits of healthcare majors differently than non-healthcare majors.

Research Hypothesis

There is a statistically significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors.

Null Hypothesis

There is no statistically significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors.

Important Terms

For the purpose of this study, the following terms were defined:

Hand Hygiene.

Any act of cleansing hands that reduces the risk of being infected by potentially harmful microorganisms using soap and water or an alcohol-based hand cleanser.

Hand Hygiene Habits.

Use of hand hygiene as measured by the hand hygiene assessment survey.

Healthcare Majors.

University students receiving an education in nursing, kinesiology, or speech-language pathology.

Non-Healthcare Majors.

University students receiving an education in a field other than nursing, kinesiology, or speech-language pathology.

Assumptions

1. Hand hygiene is used to prevent the spread of pathogens.
2. All participants have been educated on proper hand hygiene techniques.
3. Participants will respond to the survey truthfully.
4. Participants will answer the survey based on their personal hand hygiene habits.
5. The survey will accurately measure the use of hand hygiene in the participants.

Chapter II

Review of Literature

The student researcher has reviewed the following literature involving hand hygiene. A total of ten studies have been reviewed and placed in three categories pertaining to hand hygiene in healthcare settings, hand hygiene of college students, and hand hygiene during the COVID-19 pandemic.

Hand Hygiene in Healthcare

Haverstick et al. (2017) performed a quantitative research study that gathered data from 172 patients in a cardiothoracic post-surgical unit over a span of 19 months. The purpose of the study performed by Haverstick et al. was to improve the education and hand hygiene practices of patients. Haverstick et al. began by providing each patient with their own personal bottle of hand sanitizer. The patients were educated on hand hygiene practices by nurses. Haverstick et al. administered a survey to the participants at various points throughout the study.

At monthly intervals during the study, vancomycin-resistant enterococci and methicillin-resistant *Staphylococcus aureus* were monitored. At the conclusion of the study, Haverstick et al. reported that methicillin-resistant *Staphylococcus aureus* decreased by 63% and vancomycin-resistant enterococci decreased by 70% over the 19-month span. Haverstick et al. concluded that hand hygiene practices in the observed unit were influenced by the education that the patients received regarding hand hygiene.

An observational study by McDonald et al. (2020) attempted to discover if home health nurses abide by hand hygiene guidelines. Two checklists were utilized to collect data from

participants. The participants consisted of a mix of 50 registered nurses and licensed practical nurses employed by a nonprofit certified home health agency. Each nurse was observed a total of eight times (McDonald et al., 2020).

McDonald et al. observed 2,014 opportunities to perform hand hygiene. The nurses observed in the study performed hand hygiene the most after coming in contact with bodily fluids and the least after touching the patient. Hand hygiene frequency was increased when the patient was at an increased risk of infection and when the nurse felt that the environment was unclean (McDonald et al., 2020).

Sands and Auger (2020) performed a study to determine factors that influence hand hygiene behaviors in United States nurses. A sample of 540 acute care nurses with at least one year of experience were used. Sands and Auger used a self-administered, anonymous survey to gather the data. The factors addressed in the survey were professional role, social normalcies, physical modifications to the work environment, professional status, and social affiliation.

Sands and Auger (2020) report that 68% of the participants spent 80% of their workday providing direct patient care. The nurses reported that hand hygiene was emphasized while they were training, both in school and upon hire. Sands and Auger report that nurses were more likely to perform hand hygiene when leaving a room than when entering a room. Sands and Auger propose that hand hygiene performance is most influenced by the openness of management, perceived performance of peers, increased staff and patient interactions, and the patient load of the nurse.

Qasmi et al. (2018) examined hand hygiene, knowledge, and attitudes of medical students. A self-administered survey was used to gather data. The study included 450 medical students in their third to fifth years. The questionnaire showed 56.8% of the participants reported compliance with hand hygiene guidelines. Students enrolled in public universities showed better hand hygiene knowledge and compliance than participants enrolled in private universities. Participants who showed higher hand hygiene knowledge reported better hand hygiene attitudes and practices (Qasmi et al., 2018).

Boyce et al. (2017) studied the use of alcohol-based hand rubs (ABHR) by nurses. An electronic compliance monitoring system (ECM) was used to review how often nurses used ABHR per hour in each shift. Boyce et al. reviewed 3,487 articles published on PubMed between 1970 and 2015 containing the terms “handwashing, hand hygiene, hand hygiene compliance, and alcohol-based hand rubs.” Boyce et al. concludes that the highest use of ABHR was reported to be in medical intensive care units with nurses using ABHR a maximum of 141 times per shift in 95% of shifts.

Hand Hygiene in College Students

A study conducted by Taylor et al. (2010) evaluates the hand hygiene practices and the awareness of the benefits of performing hand hygiene in college students. Taylor et al. randomly selected 100 students from a university located in the southeastern United States. Of the students, 50 were males and the other 50 were females. Half of the selected students majored in a science related field while the other 50 majored in a non-science related field. Taylor et al. predicted that female students would have more knowledge regarding hand hygiene and would be more likely to perform hand hygiene. It was also predicted that students majoring in a science related field would be more knowledgeable of the benefits of hand hygiene.

Taylor et al. selected ten popular bathrooms on campus and observed the selected students for one hour in between classes. Upon leaving the restroom, the students were given a

survey to measure the knowledge of hand hygiene and how often the students were sick. Taylor et al. discovered that 70% of the students performed hand hygiene in the restroom. The study concluded that females are more likely to perform hand hygiene than males and that science majors were more likely to perform hand hygiene than non-science majors (Taylor et al., 2010).

A study conducted by Martin et al. (2020) compares the hand hygiene knowledge of healthcare students and their attitude regarding hand hygiene and identifies the hand hygiene intentions of the students before and after contact with patients. Martin et al. performed an observational, cross-sectional, and multicentered study that looks at second and third-year public health majors at four different universities. Participation in the study was voluntary. A convenient sample was utilized. In this study, 960 students were given a questionnaire to be answered during class. A presentation about the purpose of the study and the department conducting the study was given to the students. No questions were answered after the presentations. The return of a completed survey was considered to be consent for participation (Martin et al., 2020).

Of the selected students, 657 were medical students and 303 were nursing students were surveyed by Martin et al. 731 of the participants were female. The hand hygiene knowledge of the students was considered to be acceptable based on their survey answers. The questionnaire results suggested that hand hygiene is not valued adequately. Half of the students said they would perform hand hygiene more often if it was important to their patient care and 44% of the students responded that they would perform hand hygiene more if there was more peer pressure around hand hygiene compliance. Martin et al. conclude that the number of students who reported performing hand hygiene before contact with a patient is significantly lower than those who reported performing hand hygiene after contact with a patient.

Hand Hygiene During the COVID-19 Pandemic

A study conducted by Sharma et al. (2021) gathered data from 713 students who attended a university in the southern United States. The study uses a multi-theory model to obtain data on handwashing behavior of college students during the COVID-19 pandemic. Sharma et al. compares long-term behaviors to short-term behaviors and how frequently the participants perform hand hygiene. A survey was used to attempt to collect the most accurate data on if students followed the hand hygiene recommendations set forth by the Centers for Disease Control and Prevention during the COVID-19 pandemic.

The participants of the study performed by Sharma et al. were required to be registered college students 18 years of age or older, have internet capabilities, be able to communicate in English, and sign an authorized consent form. The survey prevented the same internet protocol address from being used multiple times to ensure accuracy and fairness. Sharma et al. conclude that a significantly larger number of students did not follow the recommended guidelines than the number of students who did follow the recommendations.

Moore et al. (2021) use a quantitative study to examine the hand hygiene performance of healthcare workers during the COVID-19 pandemic to determine if the pandemic changed hand hygiene behaviors. To determine if the pandemic led to behavior changes, the time of school closures was chosen to be the point in time relating to the behavioral changes. Moore et al. utilized the Purell Smart Link Activity Monitoring automated system to collect data. The monitoring system was placed near 74 adult patient doorways in seven hospitals and 10 pediatric patient doorways in two children's hospitals to detect movement in and out of the door. Each entry and exit were considered to be one opportunity to perform hand hygiene.

Moore et al. record 35,362,136 hand hygiene opportunities but only 18,457,669 dispense events. Hand hygiene rates increase from 48.52% before school closures to 58.05% after school closures. However, both the weekly hand hygiene opportunities and the dispense events decrease after the school closures occur. Moore et al. conclude that the pandemic did not improve hand hygiene habits.

Guidry et al. (2021) examine the effects of demographic and psychosocial factors on the likelihood of a person to use COVID-19 preventative methods. A survey was administered to 500 adults in the United States. The survey focused on social distancing, hand hygiene with soap and water for a minimum of 20 seconds, avoiding contact with the face, avoiding contact with sick individuals, staying home when feeling sick, covering coughs and sneezes with an elbow, and avoiding large gatherings as COVID-19 preventative measures (Guidry et al., 2021).

Guidry et al. found that 56.8% of participants responded that they were extremely likely to avoid touching their face. 74.2% of the participants claim to be extremely likely to wash their hands for at least 20 seconds with soap and water. The results show that women showed significantly higher intentions of adhering to the COVID-19 preventative measures than their male counterparts (Guidry et al., 2021).

Conclusion

Hand hygiene is shown to reduce the prevalence of infection in all settings. The reviewed literature found factors such as the COVID-19, time available, proper education on the spread of infection, and peer pressure influence hand hygiene practices. The research identifies barriers and levers to hand hygiene compliance. While there were no conflicting findings, studies that considered gender as a factor all found that females were more likely to perform hand hygiene regularly than males. However, further education and research regarding is necessary due to a persisting lack of hand hygiene compliance.

Chapter III

Research Design

In this study, the student researcher utilized a cross-sectional, quantitative, comparative design to evaluate the hypothesis. The focus of the design was to identify if there was a difference in how Covid-19 affected hand hygiene habits in healthcare majors and non-healthcare majors. Evaluated areas included after going to the restroom, before eating, when hands are visibly soiled, and other various situations. The participants were also asked to identify if they believed that Covid-19 affected their hand hygiene habits. If they selected that Covid-19 had affected their hand hygiene habits, they were asked what areas were affected. The categories provided for the participants to choose from included materials used, frequency, and length of time. The design utilized a quantifiable survey. The survey utilized a Likert scale format to score the participants' responses. The survey was appropriate to test the research hypothesis. The design was cross sectional due to the participants only needing to respond to the survey one time. A comparative design was utilized by assessing the participants' majors and then comparing their daily practices.

Variables

The independent variable in this study was the majors of the participants. The dependent variable was the hand hygiene habits of the participants. The control variables were the Hand

Hygiene Questionnaire and the language used when administering the survey to participants. Extraneous variables included the participants' knowledge of hand hygiene, activity that occurred during the data collection period, the personal beliefs each participant held regarding when hand hygiene should be performed, and personal history of illness and practices in self and family.

Selection of Subjects and Setting

The student researcher obtained permission to survey the target population of university students at least 18 years of age. Participants were either healthcare majors or non-healthcare majors. The accessible population was students enrolled in a small liberal arts university in the southeastern region of the United States. The university contained both demographic groups. The survey was issued to 19 healthcare majors and 35 non-healthcare majors. The criteria each participant had to meet were enrollment in the university and at least 18 years of age. A convenient sample of students at the university cafeteria was utilized. The accessible population may not represent the target population because the student body was 80% female (Geuder, 2017).

Data Collection Instruments

The data collection tool "Hand Hygiene Questionnaire" (Appendix A) utilized in this study was created by the student researcher and approved by a panel of experts. The data collection tool contained demographic and content questions. The student researcher wanted to know if the participants were at least 18 years of age, a healthcare major or not, male or female, and if they felt that the Covid-19 pandemic affected their hand hygiene habits. The survey utilized a 5-point Likert scale. Questions in the content portion of the survey obtained information about basic hand hygiene habits. The answer choices to be selected by participants included "never," "rarely," "sometimes," "often," and "always." Each answer choice was assigned a numerical value. "Never" was assigned a value of one, "rarely" was given a value of two, and so forth.

Statistical Analysis

The data collected in this study was analyzed by the use of descriptive statistics and a *t* test. Demographic answers were necessary to categorize each subject into one of the two sub-groups. The *t*-test was necessary to compare the responses between healthcare majors and non-healthcare majors. The *t*-test indicates that there is no statistical difference in how Covid-19 has affected the hand hygiene habits of the two sub-groups. A 95% confidence interval will be used in this research study.

Data Collection Procedures

The student researcher obtained permission from the Institutional Review Board (IRB) (Appendix B) of the university. The student researcher then obtained permission from the oversight person(s) of the public location utilized at the university (Appendix C). After all necessary consent was received, the student researcher worked with university faculty to identify a convenient time to collect data. Once IRB consent was obtained and permission from the location's oversight person(s) was given, the student researcher scheduled multiple days and various time frames on the given days to administer the survey. During the administration of the

survey, the student researcher utilized the same dialogue for each participant (Appendix D). The student researcher set up a table in the public space to administer surveys. Potential subjects were approached and asked to participate in the study. Consent was given by participants by the submission of a completed survey. Participants were provided privacy while taking the survey by being allowed to step away to a separate table which had privacy screens. The participants turned their survey into a designated envelope supervised by the student researcher. The student researcher left the public space once all data was collected.

Limitations of the Study

The student researcher identified multiple limitations within the research study. One limitation identified was the possibility participants may have felt pressured by their peers to select particular responses on the survey. Another limitation was the Hand Hygiene Questionnaire may not have accurately measured participants' daily hand hygiene habits. A third limitation was time constraints, which may have resulted in inaccurate data collection. The next limitation identified was the small sample size available due to only administering the survey on one small college campus. The last limitation was the possibility of the participants having a deficit in the knowledge of proper hand hygiene methods and when to perform hand hygiene. The identified limitations may have skewed the results of the research study.

Chapter IV

Original Hypothesis

This research study was conducted to determine if there is a difference in how Covid-19 affected the hand hygiene practices of healthcare majors and non-healthcare majors. The research hypothesis utilized stated there will be a statistically significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors. The null hypothesis stated there will be no statistically significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors. Based on the data analysis, the student researcher failed to reject the null hypothesis.

Other Research Study Findings

The student researcher reviewed ten previous studies that were conducted to study hand hygiene. One study was consistent with the research conducted by the student research, but not with the findings. Taylor et al. (2018) went to frequently used restrooms on a college campus and observed the hand hygiene practices of science majors versus non-science majors. The study concluded science majors have better hand hygiene habits than non-science majors. In contrast, the study conducted by this student researcher used a survey to gather data and concludes non-healthcare majors have better hand hygiene habits than healthcare majors, but Covid-19 did not affect the habits of the two subgroups.

Contradictory Findings

Based on the student researcher's data collection, no contradictory findings were identified.

Limitations

The student researcher identified a few limitations during the data collection period. The data collection period was limited due to time constraints, which also led to a small sample size. There was an unequal distribution of subgroups that resulted in more non-healthcare participants than healthcare participants. Another limitation was that the data collection was limited to one geographical location. The final limitation was the truthfulness of the survey responses provided. Each of these limitations may have impacted the results of the study.

Alterations from Proposal and Serendipitous Findings

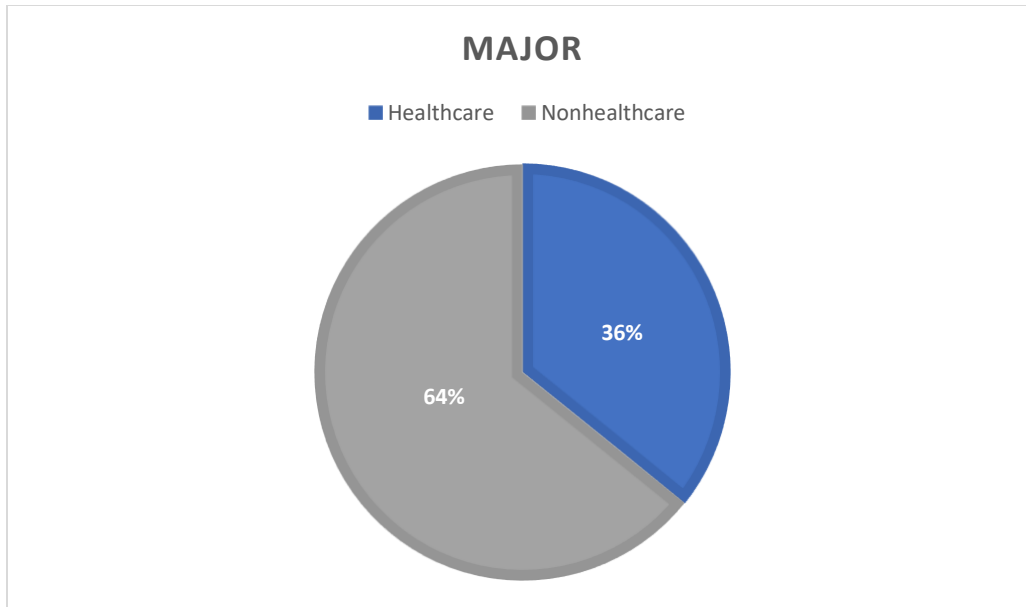
No alterations from the original research proposal were made and no serendipitous findings identified upon data analysis.

Statistical Analysis

Statistical testing was required to formulate findings of the study. The Hand Hygiene Questionnaire utilized to survey the participants of hand hygiene based on their usual routine was created by the student researcher. The survey contained two demographic questions, two Covid-19 impact questions, one question regarding the effectiveness of hand sanitizer versus soap and water, and seven questions on the frequency of hand hygiene performance. The student researcher obtained a total of 53 responses to the survey during the designated collection time in the university cafeteria. All surveys were fully completed, and no survey responses were discarded. The first demographic question asked if the respondent was male, female, or preferred not to respond. The second demographic question asked if the respondent was a healthcare major or non-healthcare major. In total, 19 surveys from healthcare major students and 34 surveys from non-healthcare major students were obtained. This concludes that 64.2% of respondents were non-healthcare majors and 35.8% were healthcare majors (Figure 1).

Figure 1

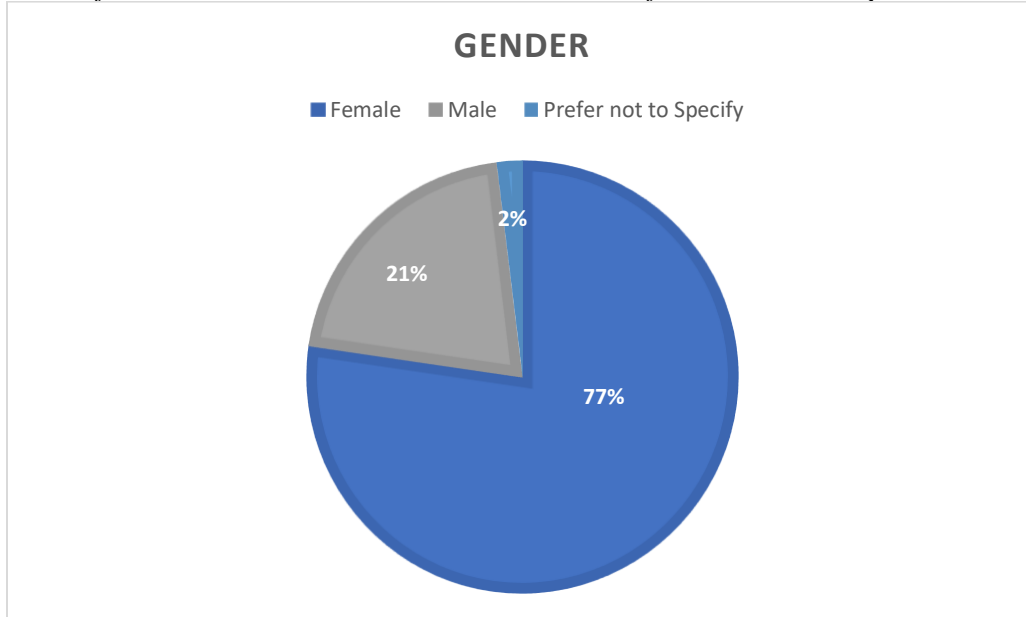
Ratio of Healthcare Major Students and Non-Healthcare Major Students



It was found that out of the total 53 students 20.8% were male, 77.4% were female, and 1.9% preferred not to respond (Figure 2).

Figure 2

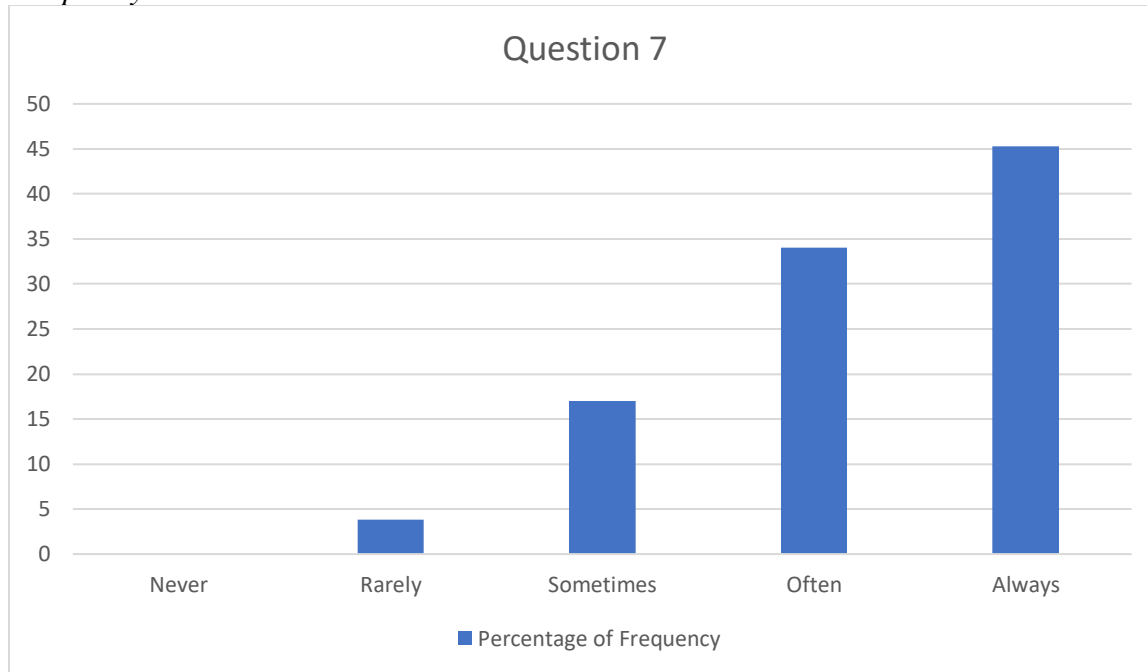
Ratio of Students Who Were Male, Female, or Preferred Not to Respond



The final seven questions of the survey were scored based on the frequency of hand washing behaviors by the respondent. The more frequently the respondent practiced hand hygiene, the higher the score received. A range of one to five points was awarded for each question. The average total score for both subgroups was 27.887 with a possible minimum score of 16 and maximum score of 35. The average score for healthcare majors was 25.579 and the average score for non-healthcare majors was 29.177. The average score for each individual hand

hygiene practice question was also calculated. Question 7 asked if hands are washed for at least 20 seconds every time. The majority always wash their hands for a minimum of 20 seconds with a percentage of 45.3, as shown in Table 1.

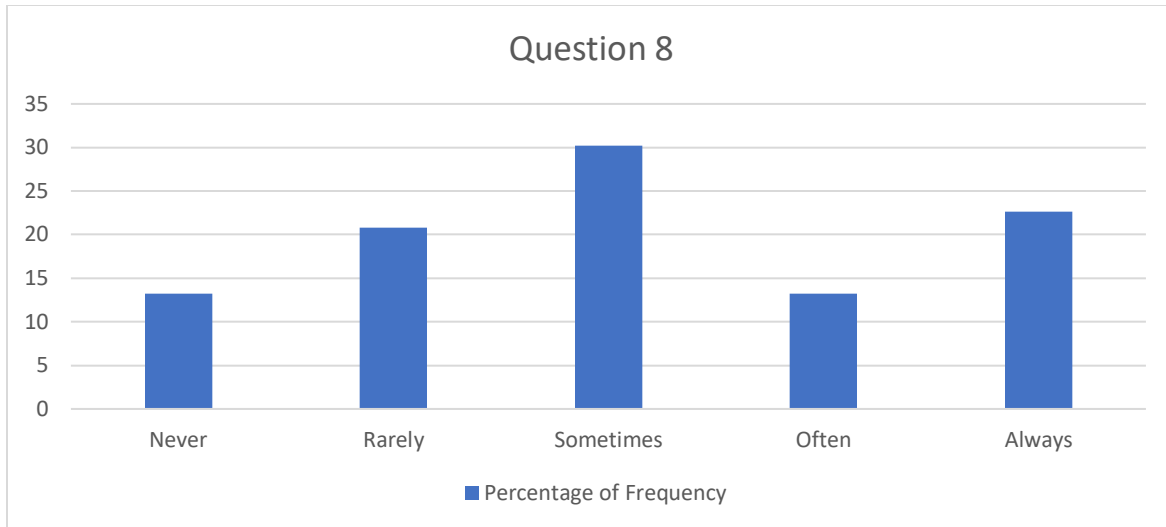
Table 1
Frequency Hands Are Washed 20 Seconds



Question 8 asked if hand hygiene is performed when waking up in the morning (Table 2). The most frequent response was sometimes with a percentage of 30.2.

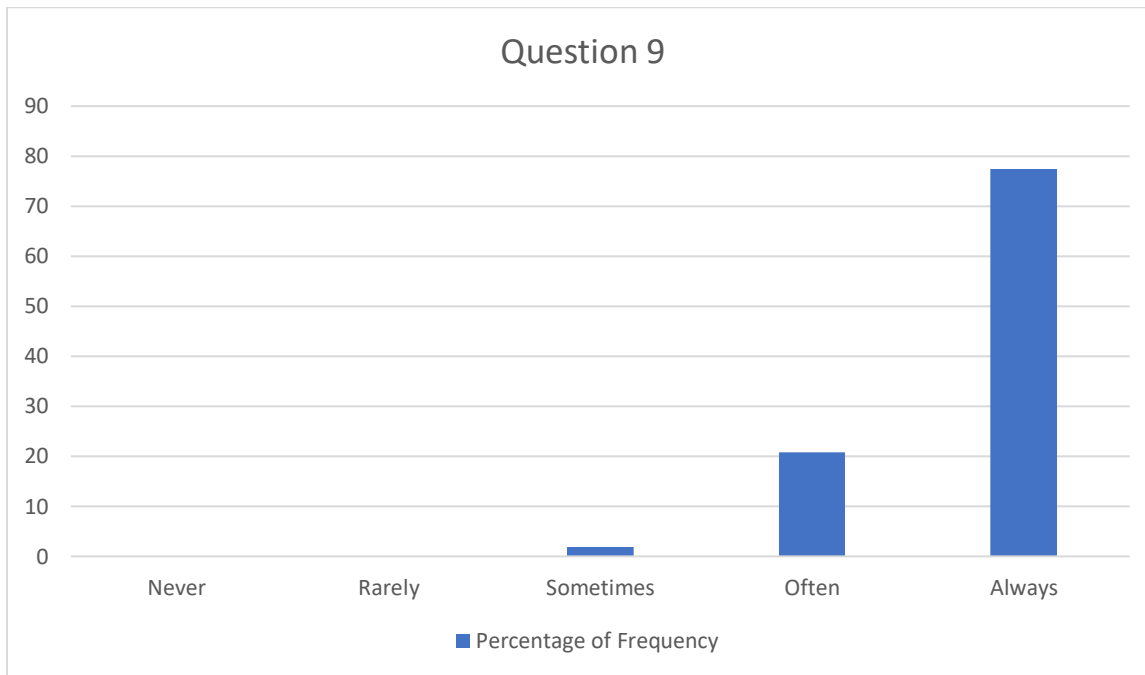
Table 2
Frequency Hands Are Washed After Waking

How Covid-19 Has Affected Hand Hygiene Habits



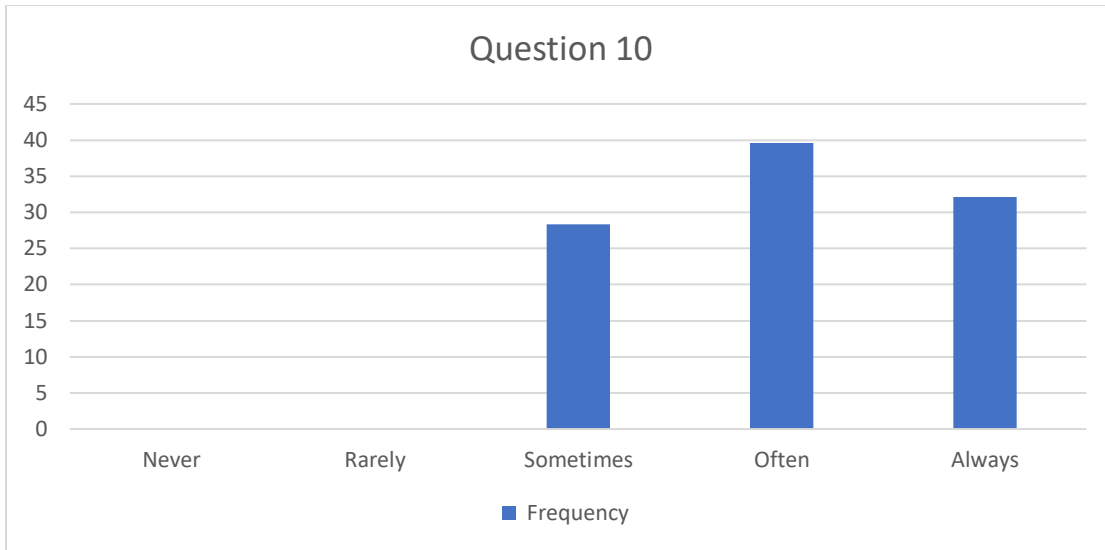
Question 9 asked if hand hygiene is performed when exiting the restroom. It was found 77.4% always wash their hands before exiting the restroom, as seen in Table 3.

Table 3
Frequency of Hand Hygiene in Restroom



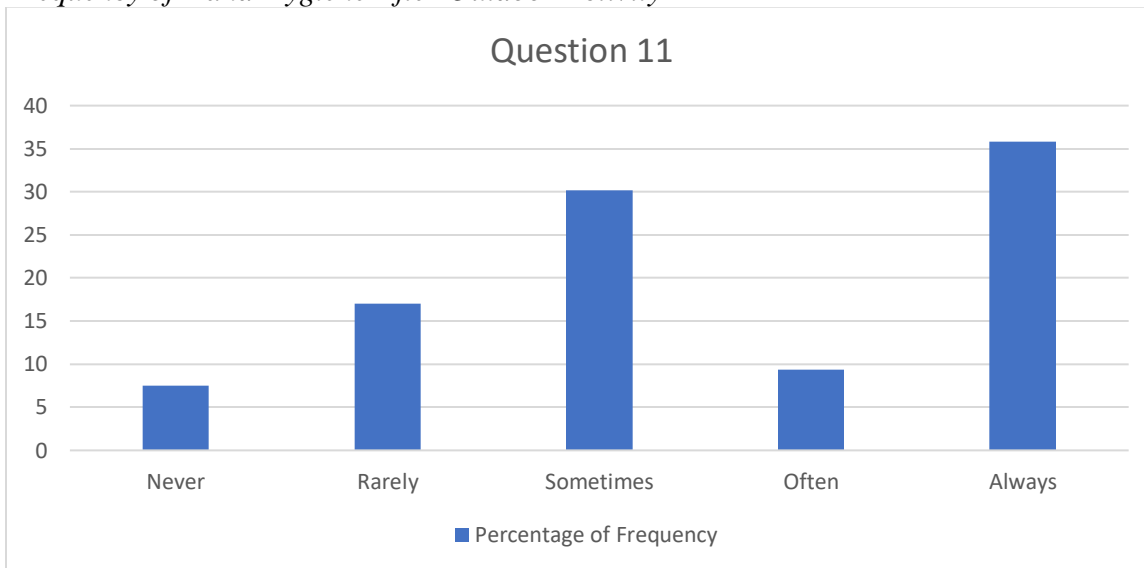
Question 10 asked if hand hygiene is performed before eating (Table 4). The most common frequency reported was often with a percentage of 39.6.

Table 4
Frequency of Hand Hygiene Before Eating



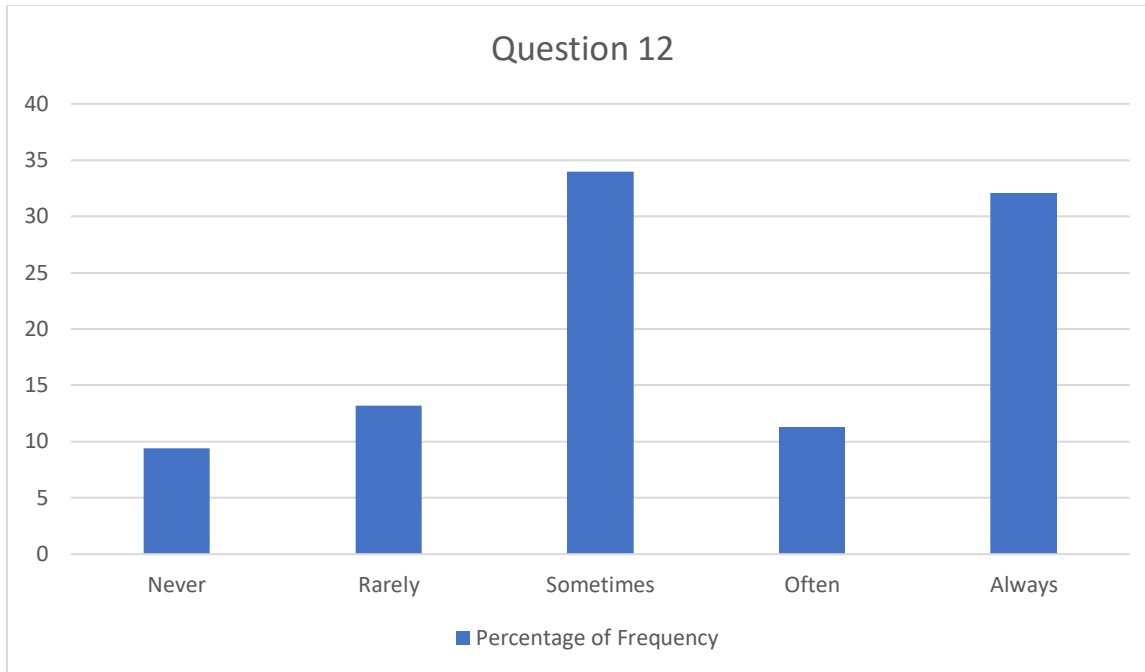
Question 11 asked if hand hygiene is performed when coming inside from an outdoor activity (Table 5). Always was the most frequent answer with an average score percentage of 35.8.

Table 5
Frequency of Hand Hygiene After Outdoor Activity



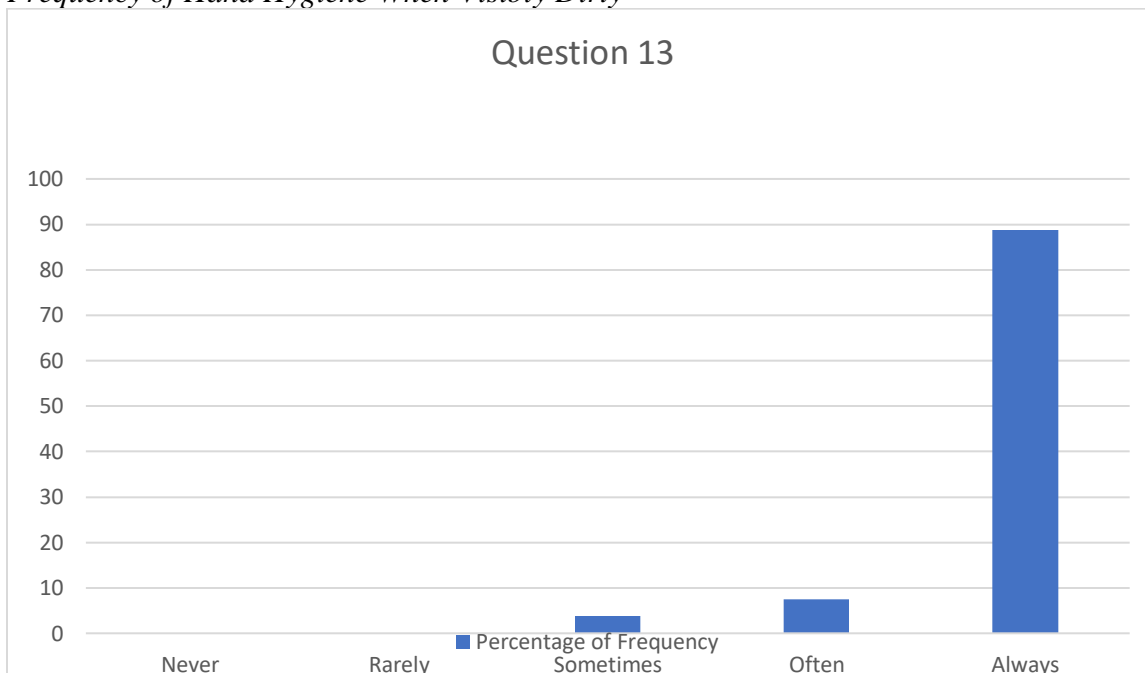
Question 12 asked if hand hygiene is done when getting home from school or work, as shown in Table 6. The surveys showed 35.8% of respondents always wash their hands after these activities.

Table 6
Frequency of Hand Hygiene After School or Work



Finally, question 13 asked if hand hygiene is performed when hands are visibly soiled (Table 7). This question reported an average percentage score of always with 88.7%.

Table 7
Frequency of Hand Hygiene When Visibly Dirty



Additionally, 3.8% of respondents believed both hand sanitizer and soap and water were most effective in preventing the spread of pathogens. Another 17.0% reported hand sanitizer was most effective, and 79.2% reported soap and water was most effective. From the 53 respondents, 58.49% stated Covid-19 has impacted their hand hygiene habits and 41.51% stated Covid-19 has not.

Once the data collection process was completed, the student researcher analyzed each survey. A *t*-test was utilized to determine the significance of the results. The *t*-test revealed no statistically significant difference in how Covid-19 affected the hand hygiene practices of healthcare majors and non-healthcare majors. The *P* value was determined to be 0.949, *df* was 51, and the *t*-value was 0.064. As a result, the student researcher failed to reject the null hypothesis.

Chapter V

Summary

The purpose of this study was to determine if there was a statistically significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors. The student researcher hypothesized there is a statistically significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors. The student researcher sampled 53 students at a public university who were 18 years of age or older with the Hand Hygiene Questionnaire survey tool. Of the total 53 students, 19 were healthcare majors and 34 were non-healthcare majors. The null hypothesis stated there is no statistically significant difference between how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors. The statistical analysis test used to test the student researcher's hypothesis was the *t*-test. Upon analysis, there was no statistically significant difference in how healthcare majors and non-healthcare majors reported Covid-19 affected their hand hygiene habits; therefore, the student researcher failed to reject the null hypothesis.

Conclusions

Overall, there was no significant difference in how Covid-19 affected the hand hygiene habits of healthcare majors versus non-healthcare majors, as evidenced by the responses to the Hand Hygiene Questionnaire. The most revealing questions on the questionnaire were the Covid-19 impact questions. Of the participants, 58.49% reported that Covid -19 has affected their hand hygiene habits, while 41.51% reported the opposite.

The student researcher's thought as to why the null hypothesis was not rejected is that every person has been impacted by Covid-19 in some way. Non-healthcare majors may be more cognizant of their hand hygiene habits because of the Covid-19 pandemic. Meanwhile, healthcare majors may feel desensitized to what their hands come in contact with because of how frequently they are exposed to environments in healthcare that are not considered to be clean.

Implications

While this study mainly focused on how Covid-19 affected the hand hygiene habits of healthcare majors and non-healthcare majors, the study revealed several implications for hand hygiene practices. These implications include the profession of nursing and healthcare, current evidence-based practice, and concepts of nursing actions. Hand hygiene is lacking in regard to nursing actions and the nursing profession in general. It is suggested that hand hygiene compliance in the nursing profession should be increased. Education about the effects of poor hand hygiene compliance can increase awareness of low compliance. Another way to increase compliance includes peer observation.

Evidence based practice implications of this study include that hospitals should implement observers to increase the amount of handwashing the healthcare workers participate

in. The reason behind this implication is if an anonymous observer were to be present, the healthcare workers would be more aware of their hand washing behaviors. Another implication is increasing hand hygiene compliance decreases the risk of infection, therefore protecting patients from additional infections acquired in the healthcare setting. These infections caused by poor hand hygiene compliance cost the hospital significant amounts of money. In addition, these infections increase the amount of antibiotics administered. When the administration of antibiotics is increased, antibiotic resistant strains of infections are increased as a result as well.

Recommendations

The student researcher has found recommendations for future studies. Data collection methods can be improved by increasing the sample size, lengthening the amount of time allowed to collect data, and broadening the locations where data is collected. Increasing the locations where data is collected would also increase the sample size available. An increased sample size would allow for more accurate data and increase the amount of data points obtained. Extending the amount of time for collecting data will also help increase the sample size. The survey used was dependent on the sample being truthful. A final recommendation is to observe the healthcare and non-healthcare majors during the act of handwashing to increase the validity of the study.

Theoretical Application

The results of the study indicate that more education on the importance of hand hygiene compliance is needed for students in the field of healthcare. Nightingale's Environmental theory emphasizes the importance of providing a clean environment when giving care, which includes proper hand hygiene of care providers. The low survey scores of the healthcare students highlight the importance of Nightingale's theory in today's healthcare education. Without proper hand hygiene, care providers are not creating an ideal care environment which, in turn, increases the risk for infection in clients overall.

References

Boyce, J., Polgreen, P., Monsalve, M., Macinga, D., & Arbogast, J. (2017). Frequency of use of alcohol-based hand rubs by nurses: a systematic review. *Infection Control & Hospital Epidemiology*, 38, 2. <https://eds-b-eb.scohost-com.libprxy.muw.edu/eds/detail/detail?vid=5&sid=6bb79653-ed1a-489a-8bd5->

- 835d3b86bae3%40sessionmgr102&bdata=JnNpdGU9ZWRzLWxpdmUmc2NvcGU9c2l0ZQ%3d%3d#AN=27817756&db=cmedm.
- Cambil-Martin, J., Fernandez-Prada, M., Gonzalez-Cabrera, J., Rodriguez-Lopez, C., Almaraz-Gomez, A., Lana-Perez, A., & Bueno-Cavanillas, A. (2020). Comparison of knowledge, attitudes and hand hygiene behavioral intention in medical and nursing students. *Journal of Preventive Medicine and Hygiene*, 61(1), E9–E14. <https://doi.org/10.15167/2421-4248/jpmh2020.61.1.741>.
- Centers for Disease Control and Prevention. (2018). HAI data. *Centers for Disease Control and Prevention*. https://www.cdc.gov/hai/data/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fsurveillance%2Findex.html.
- Geuder, M. (2017, September 8). W reports second-highest enrollment since 1998. *MUW*. <https://www.muw.edu/ur/news/4731-w-reports-second-highest-enrollment-since-1999#:~:text=The%20W%20maintains%20a%2014,and%2020%20percent%20are%20male>.
- Guidry, J. P. D., O'Donnell, N. H., Austin, L. L., Coman, I. A., Adams, J., & Perrin, P. B. (2021). Stay socially distant and wash your hands: using the health belief model to determine intent for COVID-19 preventive behaviors at the beginning of the pandemic. *Health Education & Behavior*, 48(4), 424–433. <https://doi-org.libprxy.muw.edu/10.1177/10901981211019920>.
- Gupta, M. K., & Lipner, S. R. (2021). Hand hygiene in preventing COVID-19 transmission. <https://cdn.mdedge.com/files/s3fs-public/Gupta%202020%20CT105005233.pdf>.
- Haverstick, S., Goodrich, C., Freeman, R., James, S., Kullar, R., Ahrens, M., (2017). Patients' hand washing and reducing hospital-acquired infection. *Critical care nurse*, 37(3), e1–e8. <https://doi-org.libprxy.muw.edu/10.4037/ccn2017694>.
- Karim, H. N. (2015). Clinical application of Nightingale theory. *International Journal of Innovative Research & Development*. https://www.researchgate.net/profile/Hina-Karim/publication/298789948_Karim_H_N_2015_Clinical_Application_of_Nightingale_Theory_International_Journal_of_Innovative_Research_and_Development_411/links/56ebd1de08aed740cbb5f94f/Karim-H-N-2015-Clinical-Applica.
- McDonald, M. V., Brickner, C., Russell, D., Dowding, D., Larson, E. L., Trifilio, M., Bick, I. Y., Sridharan, S., Song, J., Adams, V., Woo, K., & Shang, J. (2021, May). Observation of hand hygiene practices in home health care. *Journal of the American Medical Directors Association*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7490582/>.
- Menehan, K. (2020). This is how hand sanitizers help stop the spread of viruses & bacteria. *Massage Magazine*, 290, 28–30. <https://eds-b-ebsohost-com.libprxy.muw.edu/eds/pdfviewer/pdfviewer?vid=4&sid=d5e3ac6d-875a-4873-b875-2e4c3a6a005e%40pdc-v-sessmgr01>.
- Moore, L. D., Robbins, G., Quinn, J., & Arbogast, J. W. (2021, January). The impact of covid-19 pandemic on hand hygiene performance in hospitals. *American Journal of Infection Control*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7434409/>.
- Petiprin, A. (2020). Nightingale's environment theory. *Nursing Theory*. <https://nursing-theory.org/theories-and-models/nightingale-environment-theory.php>.
- Potter, P. A., Perry, A. G., Stockert, P. A., & Hall, A. (2017). *Fundamentals of nursing* (9th ed., pp. 375-460). St. Louis, MO: Elsevier Mosby.

- Qasmi, S. A., Shah, S. M. M., Wakil, H. Y. I., & Pirzada, S. (2018). Guiding hand hygiene interventions among future healthcare workers: Implications of knowledge, attitudes, and social influences. *American Journal of Infection Control*, *46*(9), 1026–1031. <https://doi.org/10.1016/j.ajic.2018.02.019>.
- Richards, S. & Balderrama, D. (2017). Hand hygiene: performing antiseptic handwashing. *CINAHL Nursing Guide*. <https://login.libprxy.muw.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=nup&AN=T909128&site=eds-live&scope=site>.
- Sands, M., & Aunger R. (2020). Determinants of hand hygiene compliance among nurses in US hospitals: A formative research study. *PLOS ONE*, *15*(4), 1-29. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0230573>.
- Sharma, M., Batra, K., Davis, R. E., & Wilkerson, A. H. (2021). Explaining handwashing behavior in a sample of college students during COVID-19 pandemic using the multi-theory model (MTM) of health behavior change: a single institutional cross-sectional survey. *Healthcare*, *9*(1), 55. <https://doi.org/10.3390/healthcare9010055>.
- Taylor, J. K., Basco, R., Zaied, A., & Ward, C. (2010). Hand hygiene knowledge of college students. *American Society for Clinical Laboratory Science*, *23*(2), 89–93. <https://doi.org/10.29074/ascls.23.2.89>.

How Covid-19 Has Affected Hand Hygiene Habits

APPENDIX A Hand Hygiene Questionnaire

Dear participant,

I am a senior nursing student and am asking you to complete this questionnaire as part of a research study. Your participation in this survey is voluntary, and you may withdraw at any time until submission of the survey. Your participation, or lack thereof, will not affect your academic standing. Your answers are completely anonymous, and the survey should take no more than five minutes. Please answer honestly, do not put any identifying information, and complete the survey once.

Please select the appropriate box:

1. I affirm I am at least 18 years of age and attend this university. Yes _____ No _____
2. Do you identify as... _____ male _____ female _____ Prefer not to Specify
3. Are you currently enrolled in the ASN nursing program, BSN nursing program, kinesiology program, or speech-language pathology program?
Yes _____ No _____
4. Has the Covid-19 pandemic affected your hand hygiene habits?
Yes _____ No _____
5. In what areas has Covid-19 affected your hand hygiene habits? (Select ALL that apply)
Materials used _____ Frequency _____ Length of time _____
6. Which method do you think is MOST effective in preventing the spread of pathogens? Washing hands with soap and water _____
Cleansing hands with an alcohol-based hand sanitizer _____
7. Please select the appropriate box below regarding your most frequent habits.

	Never	Rarely	Sometimes	Often	Always
I wash my hands with soap and water for at least 20 seconds every time I perform hand hygiene.					
I wash my hands when I wake up in the morning.					
I wash my hands when exiting the restroom.					
I wash my hands before eating.					
I wash my hands when coming in from an outdoor activity.					
I wash my hands when getting home from school/work.					
I wash my hands when they become visibly soiled.					

Thank you for your time! Please place your survey in the brown envelope.

APPENDIX B

Dear Mr. Scott Hager,

I am currently enrolled as a senior student in the baccalaureate nursing program here at Mississippi University for Women. I am conducting a study as part of the requirements of my research class. Our study will focus on how Covid-19 has affected hand hygiene between the different majors. I am asking your permission to allow us to set up in the lobby of the cafeteria between the times of 11:00 a.m. to 1:00 p.m. on (date).

Students' participation in our observations will be completely voluntary. I will utilize the Hand Hygiene Questionnaire, which is a survey we created to make our observations. There will be no identifying information on the tool, and all data will remain confidential.

Your consent to allow the students to participate in this study will give me a better understanding about students' hand hygiene practice between the different majors. This information will allow us to see if there are any ways to improve hand hygiene practices in an attempt to protect against different bacteria and viruses.

Thank you for your time and considerations and allowing us to implement our study in the cafeteria. Please select the appropriate response below, provide your signature, and send a scan of this form to Anna Kate McDaniel at amcedaniel1@myapps.muw.edu.

_____ Yes, I give my permission for the student researchers to conduct this survey.

_____ No, I do not give my permission for the student researchers to conduct this survey.

Scott Hager, General Manager

Date

Sincerely,

Anna Kate McDaniel

APPENDIX C
IRB Exemption Letter

To: Dr. Osbirn, Dr. McCoy, & Anna Kate McDaniel

From: Irene Pintado, IRB Chair *I.P*

Date: 11/30/2021

Project: How COVID-19 has affected the hand hygiene habits of healthcare majors vs. non-healthcare majors

The Mississippi University for Women IRB committee has determined that your project, How COVID-19 has affected the hand hygiene habits of healthcare majors vs. non-healthcare majors, is exempt under 45 CFR 46.101 (b)(4). The research uses survey procedure and information obtained is recorded in such a manner that the identity of the research participants cannot be readily ascertained.

If any changes are made to the study, the Committee must be notified. If the project is still running twelve months after the date of this memo, please be advised that we will need an update for our files.

Good luck with your work!

APPENDIX D

Researcher's Dialogue

Hello! I am a nursing student and would greatly appreciate it if you would take about five minutes to complete this survey about your hand hygiene practices. Your answers will be completely anonymous.