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### Improving Frequency of Hand Hygiene Education from Providers to Patients

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**Improving Frequency of Hand Hygiene Education from Providers to Patients**

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NURS-653: Internship Quality Improvement Project

### **Abstract**

Hand hygiene compliance is one of the most simplest forms of preventing infection. This paper focuses on improving the frequency and standardizing hand hygiene education to patients delivered by health care professionals from a primary care clinic. The ambulatory suburban community clinic in Oakland primarily serves the underserved population. The target population are the following providers: Physicians, Physician Assistants, Nurse Practitioners, Registered Nurse, Licensed Practical Nurse, and Medical Assistants. A survey was adapted from evidence-based studies, WHO, and CDC to collect data on current hand hygiene education provided to patients from healthcare professionals. An additional survey was given to patients to assess baseline hand hygiene compliance and education that was provided by their health care providers. An educational tool was created for Physicians, Physician Assistants, Nurse Practitioners, Registered Nurse, Licensed Practical Nurse, Medical Assistants and Nursing Students to have available during patient calls to promote standardized hand hygiene education. Eighteen of 38 providers responded to surveys. Of those 18, 61.1% of health care providers stated hand hygiene education was not at all provided to their patients. The results called for standardizing hand hygiene education to be implemented using the educational tool four weeks to test effectiveness. Due to the competing demands of staff involvement during the COVID-19 transition, the clinical staff did not buy-in. For the implementation tool to take place, we recommended that future nursing students pilot the study by using the hand hygiene educational tool in person to test effectiveness. After the implementation of the educational tool during patient appointments, we would like to see an 20% increase of healthcare professionals providing hand hygiene education.

*Keywords:* Hand hygiene, hand washing, patient education

Handwashing practices in the patient care setting began as early as the 19th century beginning with proof that hand hygiene (HH) could decrease maternal mortality (Toney-Butler et al., 2020). Roughly four decades ago, the Center of Disease Control (CDC) developed guidelines on HH for hospitals to practice, which mostly focused on washing with soap and water. Along with soap and water, hand sanitizers that were alcohol-based solutions were considered alternatives when a sink in the hospitals was not available. In 2002, the CDC provided a revised guideline centralized on HH. One of the main differences between the 2002 revised guidelines and the versions from the 70s and 80's were the recommendations to use alcohol-based solutions to disinfect hands with each patient contact and the use of soap and water for hands that are visibly soiled. On May 5, 2009, the World Health Organization (WHO) developed their own guidelines on HH that are similar to that of the CDC's guidelines and focus mainly on guiding and educating healthcare staff (Mathur, 2011). Since the 19th century, HH has become more and more essential especially in the healthcare settings due to its proof through trial and error as well as research (Toney-Butler et al., 2020).

As previously mentioned, HH practice has become essential over the years and so should the method and frequency in which it is delivered. It is essential to identify if training health care providers in a community health clinic on HH education for patients, compared to no training, increases the frequency of delivering HH education to patients in a two-month period. This will provide additional evidence on the effectiveness of HH in preventing the spread of infectious diseases.

Despite recent evidence on how HH has impacted healthcare, there has been research and studies done that show that HH is not as valued by healthcare providers as it should be (Toney-

Butler et al., 2020). Healthcare professionals act as examples to the public when it comes to HH. Hence, it is essential for healthcare professionals to develop an understanding of the importance of HH so that they can educate the patient on its benefits with every visit (Toney-Butler et al., 2020). Healthcare professionals with the guidelines of the CDC and WHO, could have a great impact on the general population if they increased the frequency of HH education to patients.

According to the CDC, “hand hygiene is the single most important practice in the reduction of the transmission of infection” (Toney-Butler et al., 2020). According to a study done in India by Mathur in 2011, he discussed that the seriousness of HH is very low among the healthcare professionals in India. He discussed that there was an increase in hospital acquired infections. These healthcare professionals had no choice, but to re-educate themselves on the importance of HH in the prevention of infections. Mathur also pointed out that there is enough scientific evidence that supports that HH can alone notably reduce the risk of spreading infectious diseases (Mathur, 2011). Mathur suggested that HH is considered the most cost-effective way to reduce the transmission of diseases and the general public needs to be educated on its importance (Mathur, 2011). The take away from Mathur’s study, is that the health professionals need to see HH as a priority in their profession to protect themselves and others. The public sees health professionals as examples of healthy lifestyles. Health professionals can do this by demonstrating and educating during patient interactions continually with repetition. These types of measures demonstrate priority and competency of HH and can have a positive impact on every community's health.

Unlike the study done by Mathur in India, which was focused on improving HH among healthcare professionals, this project will focus on the healthcare professional’s ability to deliver education to patients at community health clinics. The motive of this quality improvement

project is to identify if training healthcare providers in a community health clinic on HH education for patients compared to no training, increases frequency of delivering patient HH education in a two-month period. The process begins with a survey on HH education conducted by healthcare providers. The process ends with post-survey to evaluate the effectiveness of the improvement project and patient education. The goal is to determine the effectiveness of the implementations of HH by giving a survey to the patients after the implementation of the project to determine their competency post-education by providers. As mentioned previously, HH is the most effective activity that everyone can participate in right now to reduce the spread of infectious diseases (Toney-Butler et al., 2020). The focus of the project is to improve frequency and education of HH, however, with the improvement of HH knowledge and practice, this would result in a decrease in infectious diseases among a low-income population.

A change theory will be implemented to obtain the best outcome for the quality improvement project. There are many change theories that could possibly be adapted to the type of quality improvement project discussed in this paper. One of the theories that may be very successfully implemented in this improvement project is Lewin's change theory. Lewin's Change Management Theory (Lewin, 1951), is a change theory that is not only used by healthcare workers, but it applies to a variety of fields. Lewin's theory proposes that diverse types of groups that have encountered any type of barrier or obstacle, can be influenced by positive forces, which in the end causes a positive change to occur. In order for this positive change to occur groups must participate in activities that focus on a specific change(s) using a three-step process that was developed by Lewin (Lewin, 1951). According to Lewin's theory that he published in 1951, he identified three major elements of his change theory. The first is unfreezing, which involves educating a group or creating an awareness of the need to change.

The next step requires work or the actual change to occur. What may be involved during this process is coaching and training by either the nurse manager or clinical nurse leader. And the last step of the model is refreezing, which involves evaluating effectiveness of change and adapting to the needs of the group to continue the change process (Lewin 1951). The goal is a successful positive change at the community health clinic by implementing Lewin's model

### **Aim Statement**

We aim to improve HH to prevent infectious transmission in the community clinic. The process begins the second week of September with a survey about HH education conducted on providers. The process ends with post-survey to evaluate the effectiveness of the improvement project and patient education. We expect an increase in patient education on HH and a decrease in infection rates among the general population. It is important to work on this now because HH will prevent transmission of infectious diseases.

We will be developing surveys for healthcare providers to participate and reachout to patients. The goal is to educate staff on how to educate patients on HH, to improve HH. We will then survey patients after implementation of the project to determine their competency of HH based off of the education given by their providers.

### **Context**

Hand hygiene plays a vital role in the transmission of infection in various health care settings. Handwashing and the use of hand sanitizer remains the most important measure to prevent nosocomial infections (Pittet et al., 2000). Hand hygiene plays a pivotal role in reducing infectious disease, however, compliance and education regarding this topic can be challenged in the healthcare industry. Due to the importance of this topic, evidence-based research was conducted to implement a tool to deliver effective HH education to an urban population in the

city of Oakland, California. The population in which the tool is implemented are low-income, diverse community members who seek healthcare needs through resources provided by the city of Oakland such as non-profitable and low-income clinics.

The community health clinic where the quality improvement project will take place is located in a rural neighborhood in Oakland, California serving a working-class community that is rapidly gentrifying. In the late 1970s, a group of University of California Berkeley students established the community clinic in inspiration to provide quality care to impoverished communities in the East Bay (2020). This unique clinic provides access to health care for a community that lacks basic health care needs. In the surrounding neighborhood, markets stand alone on corners promoting liquor and deli groceries rather than promoting healthy grocery stores such as Safeway and Wholefoods. In addition, encompassing the neighborhood contain corner vendors from the community members itself that work day in and day out to make a living. As a result of this, people in the community rely on these markets and local vendors as a source of dietetics for themselves and their families.

The neighborhood has become the incontestable center of Latino culture in the East Bay, and the cultural landscape has been influenced by a fast-growing segment of the population (Economic development and commercial corridor strategy, 2020). The community offers Latino-oriented goods and services, authentic Mexican and Central American cuisine, and cultural events such as Día de Los Muertos, which gather residents from various cities in the Bay Area to the community. Events such as El Día de Los Muertos, allows the members of the community to represent their cultural roots and to demonstrate to others the authenticity of the community. In addition to retail, restaurants and cultural events, this district is distinct for its social services, including health centers, and organizations that serve the greater community. The neighborhood



has adapted cultural customs from the Latin culture due to the dominant population of Latinos living in this neighborhood.

The Poverty Status in The Past 12 Months published in the U.S. Census Bureau (2018), states there is an estimate of 52,299 residents which consist of 50% female and 50% male. According to the United States census, there are a total of 50.2% Latinos, 9.7% white, 18.8% African American, and 17% Asian (The Poverty Status in The Past 12 Months, 2018). This diverse neighborhood has adapted many languages spoken, however, Spanish and English remain the dominant languages. In the past twelve months, the United States census reported an estimate of 28.4% people living under the poverty line (The Poverty Status in The Past 12 Months, 2018). From those reported living under the poverty line, 42.3% are under the age of 18 years old, 22.1% are between the ages of 35-64 years old, and 19.5% are over the age of 60 (The Poverty Status in The Past 12 Months, 2018). This information is reflective of the increased demand for healthcare services in this neighborhood.

The community health clinic delivers a variety of services to the diverse, low-income community members such as: family medicine, pediatrics, women's health, pharmacy, dental, vision and eye, laboratory, behavioral health, urgent care, community health, and health coaching (About, 2020). The services provided aid in increasing the community's overall health outcomes by providing the community with the resources needed to thrive in life. The community clinic provides its patients with the ability to receive direct medical care in Spanish, which is the predominant language in the community. In addition, the community provides its patients with low-income services such as Women, Infants, and Children is a federal assistance program (WIC) and legal services. Providing this community with accessibility of care aligns with the clinic's mission of improving quality of care to diverse communities in Oakland (About,

2020). Furthermore, these resources promote health equity by providing those with greater needs the equality to healthcare.

### **Microsystem Assessment**

The purpose of this project is for providers to improve frequency of HH education by 20% during patient visits. The population involved in this project consists of Latinos in an urban community in the city of Oakland. The professionals involved in the project consist of: Physicians, Physician assistants, Registered Nurses, Nurse Practitioners, Licensed Vocational/Practical Nurse, Medical Assistants, and Nursing students. The process began with calls in which nursing students had observed nurses ask close-ended questions to assess their patient's HH compliance. The patterns include; close-ended questions, unstabilized educational approach, and no reinforcement of importance of HH. In addition, an educational tool was created for providers to use to standardize HH education for their patient phone calls and in-person visits in the future.

### ***Fishbone Diagram***

The fishbone diagram, as seen in Appendix A, is an important tool used to identify and clarify the causes of an effect of interest, visual theory about potential causes and effects that can be used to guide work. In addition, the diagram focuses on a few top-of-mind areas, and it facilitates deeper thinking about possible causation (Nelson, Batalden, & Godfrey, 2007). The equipment listed in the fish diagram consist of; water and soap, hand sanitizer, telehealth monitors, telephone, and surveys. The process involves cancelled appointments, no established staff training, education inconsistency, lack of assessing knowledge, and the lack of accountability regarding education. The management includes; support, relationship, and sustainability. The environment is described as; limited time with patients, call and virtual visits,

HIPPA laws, distractions at home, language barriers, multifamily units, and non-personal. People are described as staff which involves various training experiences, and the lack of time to implement the tool. It is also described as patients which involves being unaware of the importance of HH, receiving different HH education, the respect for providers and lack of questions, and the lack of compliance with phone call appointments. By using this diagram, we were able to identify the causes and effects of interest that allowed guidance throughout this project.

### *SWOT Analysis*

The SWOT analysis tool, as seen in Appendix B, was used to identify the elements that can make a positive or negative influence in our quality project. The SWOT analysis tool helps to facilitate successful planning as well as implementation of the project by focusing on four key elements within the microsystem: strengths, weaknesses, opportunities and threats. Ultimately the SWOT analysis tool supports and prepares the team to be ready to approach collaborator supposition, trends, and developments in the microsystem (Harris et al., 2018).

Upon assessing for strengths at the community health clinic. We identified some important elements that would allow for our project to be successful. The strengths that were identified upon assessment were qualified and passionate providers, bilingual staff, a cost-effective project, accessibility to provide education to patient's, and the project could easily be transferable from telehealth to in-person education. Weaknesses that we found were staff being resistant to the project, lack of patient's cooperation, limited time for training and education among providers, inconsistency on how education was delivered, lack of resources, and a lack of commitment to follow through with providing education.

Some of the opportunities that we identified for this project include: increased telehealth reputation, increased staff participation, improved quality of education, reduced close-ended questions during education, improved communication, reduced the spread of infection, improved patient competency and involvement, and established standardized hand hygiene practice. The threats recognized for this project include having patients reinforce education could lengthen phone call visits, patient's unwillingness to cooperate, availability of providers and staff shortage, lack of access to phone, language barriers among patients, and hearing impairment. By utilizing this SWOT analysis tool, we assess the microsystem further in depth by analyzing its strengths, weaknesses, threats, and opportunities.

## **Methods**

### ***GANTT Chart***

The GANTT chart was used to assess, plan, implement, and evaluate the quality improvement project. The GANTT chart was divided by weeks to illustrate our progress (Nelson et al., 2007). See Appendix C to view the weekly progress of the quality improvement project. Based on this method, resources available and limitations, observations were made over the telephone with two different nurses, on different days, and on several phone call observations. We noticed there were differences in approaching education or information about HH provided to patients. This helped us identify a problem in how they were educating their clients on HH. It is vital that all patients receive sufficient and accurate education about HH in order to increase compliance and prevent spread of infection.

### **Plan-Do-Study-Act (PDSA)**

For the purpose of this quality improvement project, the PDSA cycle was used to implement the HH education project. See Appendix D that demonstrates the PDSA cycle to

follow and replicate. The PDSA will provide opportunities for intervention of the tool, evaluate effectiveness of the implementation, and make improvements for the next cycle.

### *Plan*

To increase the frequency of education of HH within a two-month period, we first conducted two pre-intervention surveys or questionnaires to collect data on both healthcare providers and patients. The questions designed for this implementation were selected and adapted from CDC, WHO, Stevenson and others (2009), and Zil-E-Ali and others (2009). To provide reliability and prevent bias, we did not ask for personal identifying information other than their health profession title and no identification was collected from patients.

### *Do*

One of the pre-intervention questionnaires consisted of 8 questions for the healthcare providers that consist of physicians, physician assistants, nurse practitioners, registered nurses, licensed vocational/practical nurses, and medical assistants. The questionnaire was converted electronically to be sent via email to the healthcare staff. See Appendix E for an example of the survey for staff written in English. The expected time to spend on the questionnaire is two minutes at the most. The second pre-intervention questionnaire was for patients in which nursing students called to ask and fill out for them. See Appendix F for an example of a survey for patients that were written in English for the purpose of this paper, and in Spanish for the Spanish speaking population. Similarly, the survey to patients was expected to take about two minutes. These questionnaires served as a baseline on how frequent providers educate their patients about HH education and to gather the perspective of patients who are or are not receiving HH education.

It took three weeks to obtain a baseline from the questionnaire from healthcare professionals and one week from patients. The implementation project was presented to the healthcare providers with the CDC guidelines and to see if they would want to educate their patients about HH based on the tool we created for the next four weeks (Healthcare providers, 2020). With approval, healthcare providers would have started implementation while three nursing students would have randomly listened in to phone calls to identify the key words from the CDC HH guidelines. Data from phone calls would have then be recorded on an excel sheet for later analysis. At the end of the fourth week of implementation, a post-intervention questionnaire (same one as pre-intervention) would have been sent and asked to be filled out from those who participated during the implementation of the project. In addition, patients who were seen the past two weeks would have been called with the post-intervention questionnaire, again the same as the pre-intervention questionnaire to compare.

### ***Study***

Results of pre-intervention surveys for both healthcare providers and patients were collected and analyzed. The pre-intervention questionnaires for providers were analyzed as a chart as demonstrated in Appendix G for healthcare providers and Appendix H for patients. If the healthcare providers would have agreed to implement our quality improvement project, the same surveys, as a post-questionnaire, would have been sent to compare with pre-intervention questionnaires.

### ***Act***

Following data analysis, evaluation of the educational tool would be implemented to determine its effectiveness and efficiency for both populations involved. Assuming the quality improvement project was effective and increased the frequency of HH education, the project will

be encouraged for physicians to participate and reevaluate in two months. Within the two-month period, it would be advised to hire an auditor outside of the organization to listen in to calls. If patients will be seen in person, the auditor will be asked to listen in person. If the HH educational tool was not effective, further evaluation would be required. The team would identify barriers, voice feedback, and/or express limitations that did not help the study or to identify areas of improvement, which would be considered the next cycle of two months. Still, an auditor would be recommended to oversee the project and gather data.

## **Results**

### **Response from Healthcare Professionals**

A survey was implemented to providers to assess the frequency and quality of HH education provided to patients, which results can be seen in Appendix I . There were a total of 38 participants for the provider surveys, from the 38 participants, there were a total of 18 responses. The results showed those who participated in the survey consisted of 22.2% of physicians, 27.8% Nurse Practitioners, 5.6% Physician Assistants, 11.1% Registered Nurses, and 5.6% of Licensed Practical Nurses and 27.8% medical assistants. Refer to Appendix E for the corresponding questions. The response to question one resulted in 5.6% always, 61.1% not at all, and 33.3% sometimes. Question two resulted in 82.4% not at all, and 17.8% sometimes. Question three results showed that 88.9% Not at all, and 11.1% sometimes, question four, 72.2% not at all, 16.7% sometimes, 5.6% not at all, and 5.6% always. Question five, 66.7% not at all, 33.3% sometimes. Question 6, 94.4% not at all and 5.6% sometimes. Question 7 resulted in 22.2% not at all, 33.3% most of the time, 5.6% always, and 38.9% always. Question 8 resulted in 83.3% yes, and 16.7% no.

### **Response from Patients**

Results from patient participation on a pre-intervention survey can be seen in Appendix J. After one week of calls, only 12 patients answered and participated in the survey to collect education data as a baseline. Seven patients said “always” and five patients said “not at all” that their healthcare provider educates them about HH and water for 40 to 60 seconds and to rub their hands for 20 to 30 seconds when using hand sanitizer. Seven said “always” that their healthcare provider educates them on how to wash their hands with soap, while one said “sometimes”, and four said “not at all”. Four patients said that their healthcare provider educates them how to dry their hands using a paper towel to close the faucet and open the door, while one said “sometimes”, one said “most of the time”, and six said “not at all”. Eight patients said they were “satisfied” with the education their healthcare providers give them on hand hygiene, while four said they are “not satisfied”.

### **Findings and Theoretical Outcomes**

Due to the unforeseeable circumstances, there was no buy-in to implement the tool created for this project. Subsequently, the following results are based on evidence-based research. Based on a similar study, we would have liked to see at least half of the participants respond to washing their hands five times per day (Miko et al., 2011). After receiving education regarding hand hygiene practices, we would have liked to see an increase in the use of soap by at least nearly half of the participants, which in this case, the participants consist of patients that would have received HH education from providers. The study performed among college students in New York reported their participants washing their hands for 15-29 seconds per wash (Miko et al., 2011). This variability is what we would have expected from our results after patients received educational facts from the CDC and WHO regarding hand hygiene. These results would



show that receiving education from providers regarding HH, can improve the overall compliance of HH among patients. The following results from the study performed at the college of New York would conclude our educational tool as being effective. An increase of the use of hand soap and hand sanitizer would conclude that teaching patients proper methods from the Center of Disease, and the World Health organization can be successful as these practices have shown to play a pivotal role in decreasing the spread of infectious diseases.

### **Discussion**

#### **Conclusion**

During this current COVID-19 crisis, the need to create awareness and educate communities on the importance of HH is more than ever. As mentioned in Mathurs 2011 study, it's important for us to go back to the basics of HH to decrease the spread of infectious diseases (Mathur, 2011). The basic guidelines on HH have been made available to the world by the CDC as well as the WHO. HH is considered the most simple and cost-effective method to help reduce the spread of disease, especially during a world pandemic. The guidelines and education are available on HH, but other priorities among healthcare professionals and clients could be interfering with this simple, yet effective task. During these challenging times, a simple reminder through re-introducing guidelines given by health organizations on HH to healthcare could help with the world's current challenge with the pandemic as well as other infectious diseases.

As a result of data that was gathered at a community health clinic located in Oakland California, we decided to focus on improving HH in that clinic, so that it would affect the communities surrounding. We found that the most effective method to improve HH compliance in the community was to educate healthcare providers on HH to increase the frequency and

standardization of HH education provided to patients based on the CDC and WHO guidelines. In the end we hoped that this would decrease the spread of infectious diseases.

We received results from our pre-survey for both patients and healthcare staff. The outcomes of the pre-survey showed that there was not a consistent delivery of HH from healthcare staff to patients during patient phone visits. This was enough evidence to develop a quality improvement project with a PDSA to improve the delivery of HH education to patients.

We started with developing a tool; inspired by the CDC, to use and a cost-effective plan to implement the tool. Based on our budget plan, the first month is the most expensive. Costing a little more than 800 dollars due mostly to time that management would spend receiving the information from us and management educating the rest of the staff members on our plan. The following months would cost less than 500 dollars. See Appendix K for the financial analysis of future implementation of the project. This money would be focused mainly on brochures, auditing and employing a unit champion to ensure our project is effectively being used .

The tool and the budget plan were presented to management and delivered to the clinic to use. However, due to some unforeseen barriers, such as time restraints being among the main concerns by the healthcare staff, the tool was not able to be put into effect at this time. This project still has the potential to assist in decreasing the spread of infectious diseases and creating a safer environment for communities if implemented. That is why we recommend that future students implement this HH educational tool in person.

### **Recommendations**

Some future recommendations to sustain the quality improvement project include implementing champions that can provide training regarding the project to incoming employees. In addition, we recommend implementing a non-medical provider, such as clerk, to be in charge

of auditing providers (physicians, nurse practitioners, physician assistants, nurses, licensed vocational nurses). Auditing providers would be a key component to assessing the compliance from the participants involved and to assess the quality of the tool implemented to this project. The auditing person would ideally include a person such as a nurse that commits to 1-2 paid hours per week to auditing providers.

In addition, we recommend that the project is continued and improved by future University of San Francisco nursing students. The potential for this project to be beneficial for this particular community and clinic is highlighted throughout the extensive evidence-based research. As a result, we recommend the collaboration from the University of San Francisco and the clinic to sustain and improve the quality improvement project.

Thus, we recommended that future nursing students pilot the study by using the HH educational tool in person to test effectiveness. After the implementation of the educational tool during patient appointments, we would like to see an increase in HH knowledge from patients. In addition, we would like to see an increase in compliance of HH from patients, after receiving proper HH education.

### **Barriers**

Due to the coronavirus-19 pandemic, the underserved community clinic is unable to see patients on a regular basis, therefore, we had to think of a quality improvement project that would be conducted virtually or via telehealth, where patients and staff could still benefit from. Currently, registered nurses and licensed vocational nurses are making calls to patients for follow up appointments and/or COVID testing results. Our observations were limited to listening into phone calls or looking into their EPIC system. When listening in to phone calls on two different nurses, we noticed there was insufficient and inconsistent HH information to patients. Since HH

is one of the most universal preventative methods used to prevent transmission of infection, our goal was to ensure the community is receiving the proper method on how and when to wash their hands. We focused our implementation to start with health care providers to educate the community so the community could continue those habits in and outside of their home.

Initially, we wanted the physicians to be the primary educators but having additional staff would provide physicians the support and be a smoother transition. When the idea was introduced with the primary educators to be Physicians, PA's, NP's, RN, and LVN, however, there was no buy-in, and it was suggested to include medical assistants. We anticipated that would happen. We did not include the MAs at first because we feared the Physicians, PA's, NP's, RN, and LVN would hand off this responsibility to the MA's, thus the MAs would be the primary educators in addition to their intake questions. We then added MAs to also implement initial HH education. Yet, there was still no buy-in.

While waiting for approval of who the primary hand hygiene educators would be, we experienced delayed communication, which also delayed in modifying or improving our project. First, we went through a third party to communicate with a nurse manager from primary care to receive feedback on our aim statement, those involved, presenting our ideas, and asking any questions to develop our quality improvement project. The delay in communication between our third party also affected our timeline. This would have been more time efficient had the three students had direct contact with the nurse manager to get direct feedback and make adjustments in a timely manner. We then requested to have one person be in direct contact with the nurse manager, which helped speed up the process. However, by that time, the team did not buy into our quality improvement project.

Unfortunately, during this unprecedented time, the primary health care providers have other priorities on top of providing care via telehealth. There could be additional training involved with technology changes, more time spent on telephone calls that delays other calls, meetings within their interdisciplinary teams, and others that we do not know of. Hand hygiene education using our tool is time consuming, which would buy time from the primary purpose of the call and/or delay other calls to other patients.

Our main focus is to have what is replicated in person over the phone, which is a physician washing their hands or talking about hand washing with the patient. Our purpose was to increase the frequency of HH and standardizing HH education to patients from physicians in a primary care clinic

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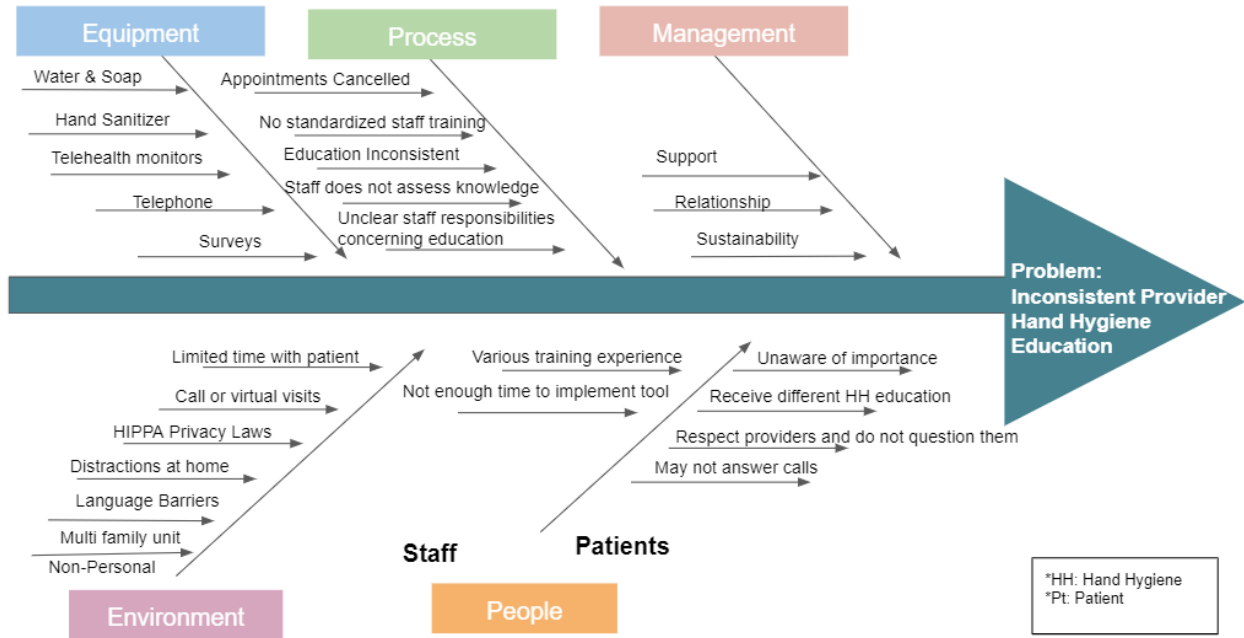
[https://www.who.int/gpsc/5may/tools/who\\_guidelines-handhygiene\\_summary.pdf](https://www.who.int/gpsc/5may/tools/who_guidelines-handhygiene_summary.pdf)

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Appendices

Appendix A: Fishbone Diagram

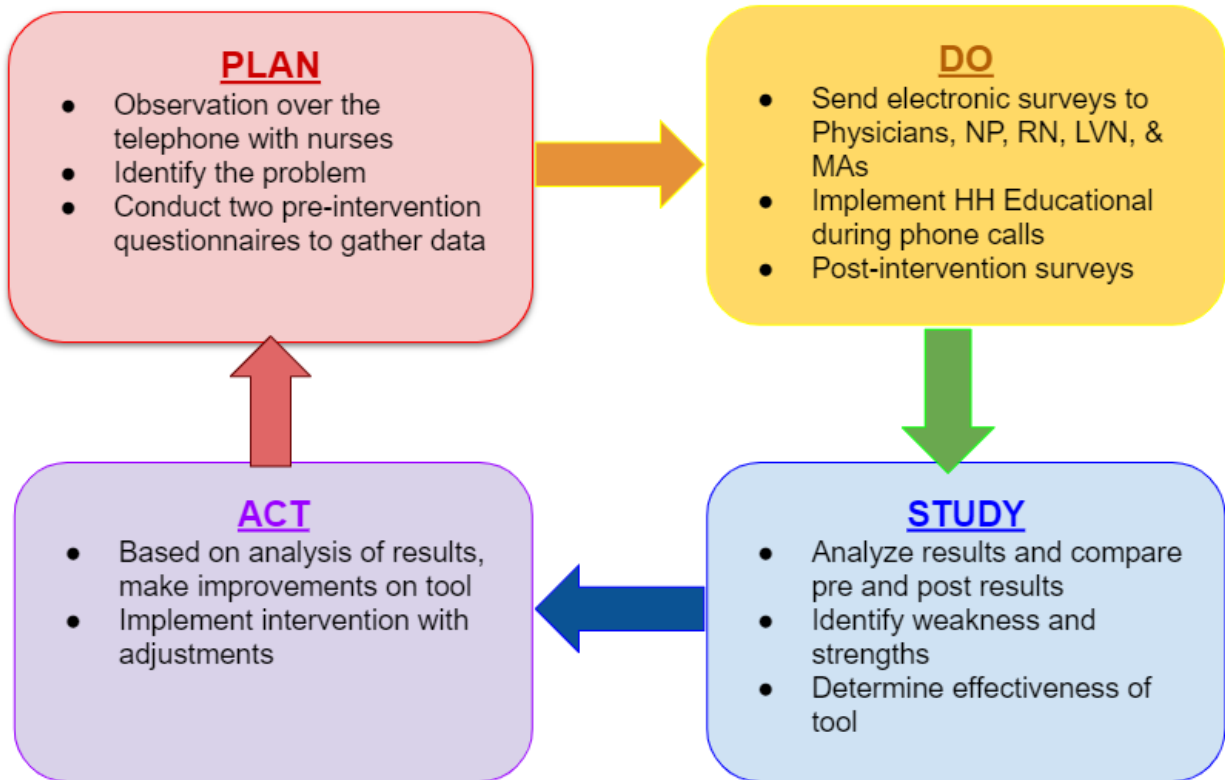




**Appendix C: SWOT Analysis**

<p style="text-align: center;"><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>• Qualified and passionate providers</li> <li>• Spanish speaking providers</li> <li>• Staff educated on hand hygiene</li> <li>• Cost effective</li> <li>• Accessibility to provide education</li> <li>• Improvement project can be transferable from telephone to in-person education</li> </ul>	<p style="text-align: center;"><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>• Staff resistance to implement project</li> <li>• Patient’s cooperation</li> <li>• Limited time for training and education among providers</li> <li>• Inconsistency in education</li> <li>• Lack of resources</li> <li>• Commitment to follow through with providing education</li> </ul>
<p style="text-align: center;"><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>• Increase telehealth reputation</li> <li>• Increase staff participation</li> <li>• Improve quality of education</li> <li>• Reduce closed-ended questions during education</li> <li>• Improve communication</li> <li>• Reduce spread of infection</li> <li>• Improve patient competency and involvement</li> <li>• Established standardized hand hygiene practice</li> </ul>	<p style="text-align: center;"><b>THREATS</b></p> <ul style="list-style-type: none"> <li>• Having patients reinforce education could lengthen phone call visits</li> <li>• Patients unwillingness to cooperate</li> <li>• Availability of providers / Staff shortage</li> <li>• Patient's not answering phone calls</li> <li>• Lack of access to phone</li> <li>• Language barrier among patients (Dialects)</li> <li>• Hearing impaired</li> </ul>

**Appendix D: PDSA Cycle**



\*NP: Nurse Practitioner, RN: Registered Nurse, LVN: Licensed Vocational Nurse, MA: Medical Assistants, HH: Hand Hygiene

**Appendix E: Pre-intervention Questionnaire Healthcare Providers****Pre-Intervention Surveys****Date:** \_\_\_\_\_**Please circle one:**

Physician, Physician Assistant, Nurse Practitioner, Registered Nurse, License Vocational/Practical Nurse, or Medical Assistant

Please answer the following questions based on the last six months.

1. Do you educate your patients to wash their hands with soap and water before eating and after using the restroom?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
2. Do you educate your patients to wash their hands with soap and water for 40-60 seconds?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
3. Do you educate your patients to dry their hands with a paper towel when available and use the paper towel to turn off the faucet and open the door?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
4. Do you educate your patients to use warm water when available?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
5. Do you educate your patients to rub their hands with alcohol-based hand sanitizers for at least 20-30 seconds?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
6. Do you ask your patients, how they prefer to wash their hands?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
7. Are you aware of the proper technique required for handwashing proposed by the World Health Organization?
  - a. Yes
  - b. No

8. Are you satisfied with your knowledge of hand hygiene?
  - a. Yes
  - b. No

**Appendix F: Pre-intervention Questionnaire Patients****Questionnaire: Patients**

The following questions are based on the last six months.

1. In each visit, has your provider educated you on washing your hands with soap and water before eating and after using the restroom?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
2. In each visit, does your provider educate on washing your hands with soap and water for 40-60 seconds?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
3. In each visit, does your provider educate you to dry your hands with a paper towel when available and use the paper towel to turn off the faucet and open the door with each visit?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
4. In each visit, does your provider teach you to rub your hands with alcohol-based hand sanitizers for at least 20-30 seconds?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all
5. Are you satisfied with the hand hygiene education given by your provider?
  - a. Always
  - b. Most of the time
  - c. Sometimes
  - d. Not at all

**Cuestionario: Pacientes**

Las siguientes preguntas están sobre los últimos seis meses.

1. ¿En cada visita, su proveedor/a le ha enseñado a lavarse las manos con jabón antes de comer y después de usar el baño?
  - a. Siempre
  - b. Algunas veces
  - c. La mayoría del tiempo
  - d. Ninguna de las veces
2. ¿En cada visita, su proveedor/a le ha enseñado que hay que lavarse las manos con jabón y agua de 40 a 60 segundos?

- a. Siempre
- b. Algunas veces
- c. La mayoría del tiempo
- d. Ninguna de las veces

3. ¿En cada visita, su proveedor/a le ha enseñado cómo secarse las manos con toalla de papel y usarla para cerrar la llave y abrir la puerta?

- a. Siempre
- b. Algunas veces
- c. La mayoría del tiempo
- d. Ninguna de las veces

4. ¿En cada visita, su proveedor/a le ha enseñado como frotarse las manos con alcohol y desinfectante por los menos de 20 a 30 segundos?

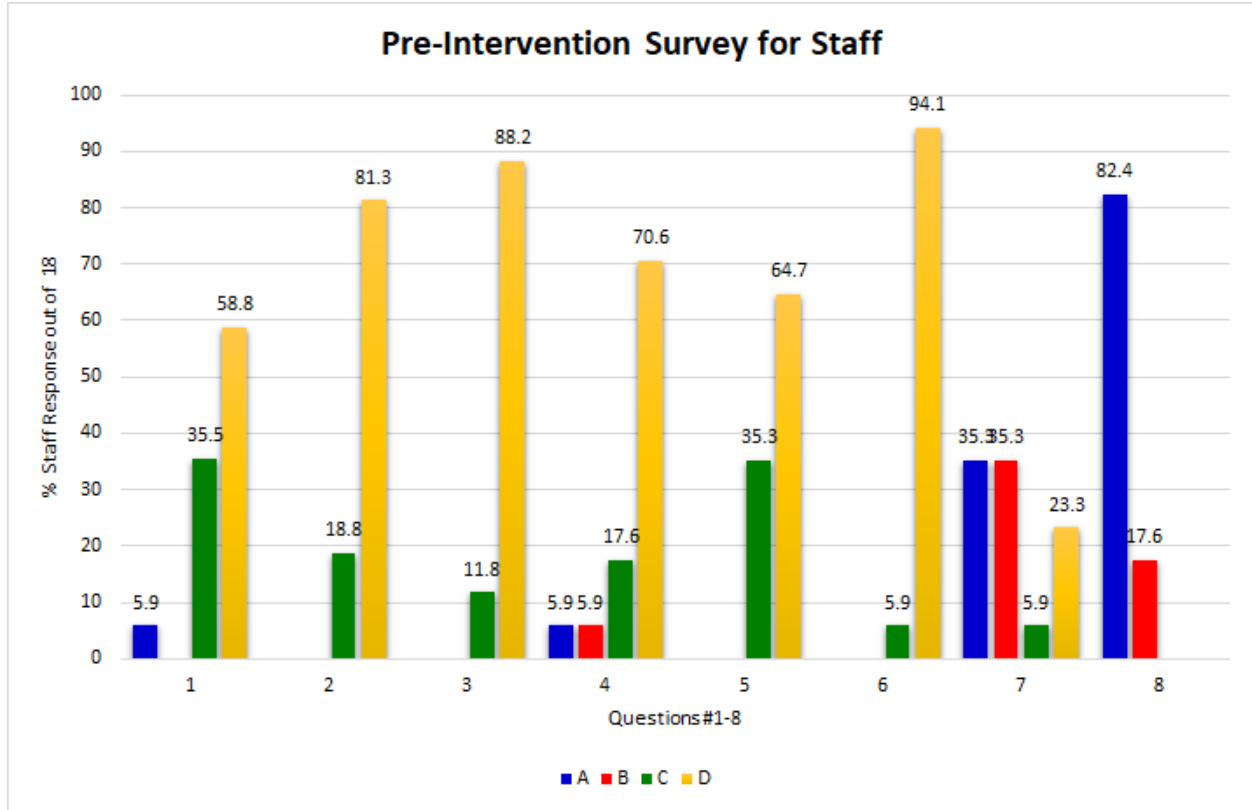
- a. Siempre
- b. Algunas veces
- c. La mayoría del tiempo
- d. Ninguna de las veces
- e.

5. ¿Está usted satisfecho/a con la educación que le ha dado su proveedor/a acerca de la higiene de sus manos?

- a. Satisfecho
- b. No satisfecho



**Appendix G: Pre-intervention Questionnaire for Healthcare professionals**

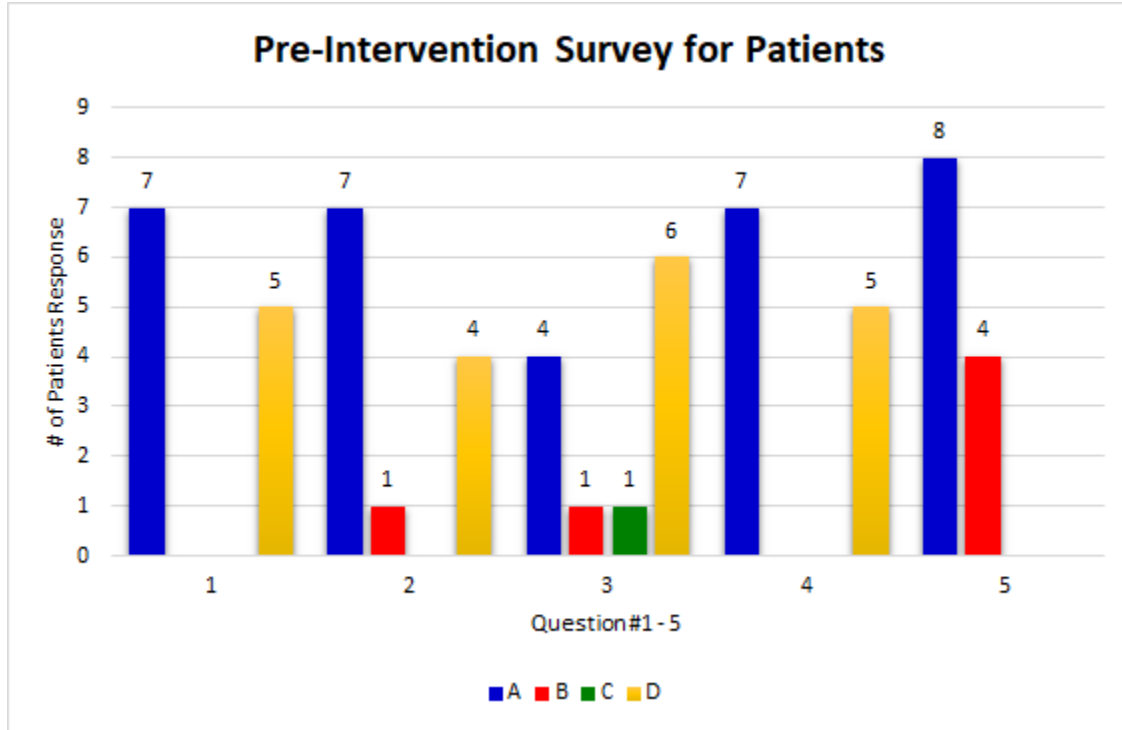


Notes: Please see below for the questions, and the corresponding answer to the colors on the chart

1. Do you educate your patients to wash their hands with soap and water before eating and after using the restroom?
2. Do you educate your patients to wash their hands with soap and water for 40-60 seconds?
3. Do you educate your patients to dry their hands with a paper towel when available and use the paper towel to turn off the faucet and open the door?
4. Do you educate your patients to use warm water when available?
5. Do you educate your patients to rub their hands with alcohol-based hand sanitizers for at least 20-30 seconds?
6. Do you ask your patients, how they prefer to wash their hands?
7. Are you aware of the proper technique required for handwashing proposed by the World Health Organization?
8. Are you satisfied with your knowledge of hand hygiene?

- A ) Blue: “Always”, Question #8: “yes”
- B ) Red: “Most of the time”, Question #8 “no”
- C ) Green: “Sometimes”
- D ) Yellow: “Not at all”

**Appendix H: Pre-intervention Questionnaire for Patients**



Notes: Please see below for the questions and the corresponding answer to the color. For the purpose of this section, the questions and answers are written in English. However, during the implementation, the questions were asked in Spanish.

1. In each visit, has your provider educated you on washing your hands with soap and water before eating and after using the restroom?
2. In each visit, does your provider educate on washing your hands with soap and water for 40-60 seconds?
3. In each visit, does your provider educate you to dry your hands with a paper towel when available and use the paper towel to turn off the faucet and open the door with each visit?
4. In each visit, does your provider teach you to rub your hands with alcohol-based hand sanitizers for at least 20-30 seconds?
5. Are you satisfied with the hand hygiene education given by your provider?

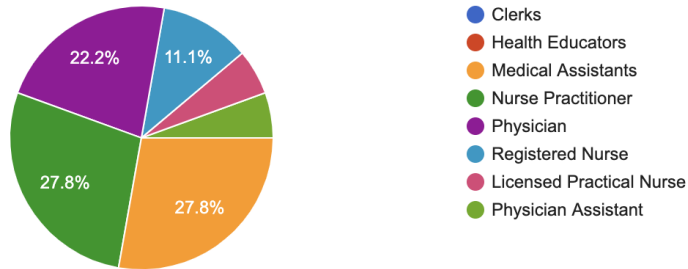
- A ) Blue: “Always”, Question #5: “Satisfied”
- B ) Red: “Most of the time”, Question #5 “Not satisfied”
- C ) Green: “Sometimes”
- D ) Yellow: “Not at all”

### Appendix I: Pre-intervention Questionnaire Healthcare Providers Results

#### Question 1:

What is your occupancy?

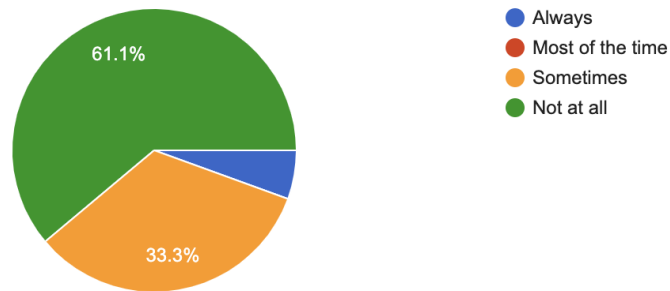
18 responses



#### Question 2:

Do you educate your patients to wash their hands with soap and water before eating and after using the restroom?

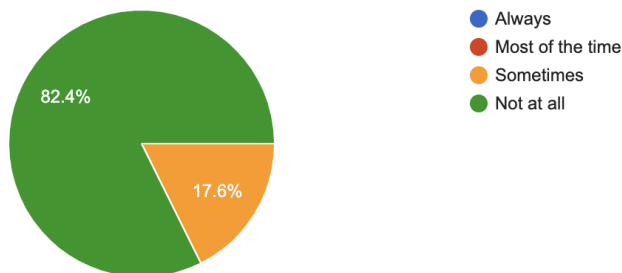
18 responses



#### Question 3:

Do you educate your patients to wash their hands with soap and water for 40-60 seconds?

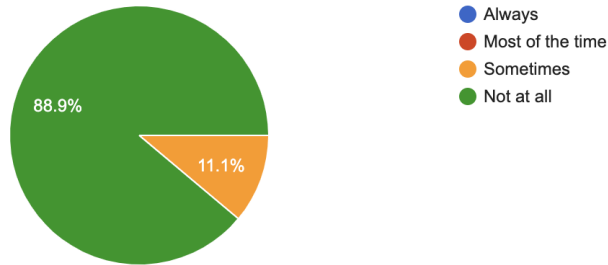
17 responses



Question 4:

Do you educate your patients to dry their hands with a paper towel when available and use the paper towel to turn off the faucet and open the door?

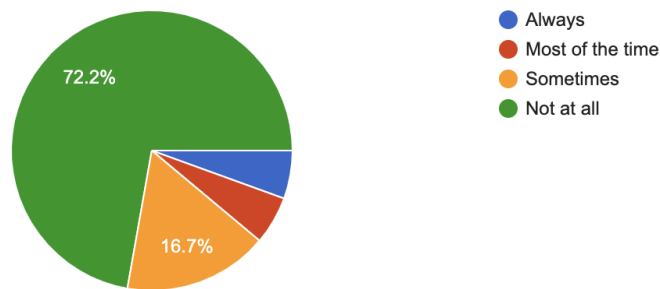
18 responses



Question 5:

Do you educate your patients to use warm water when available?

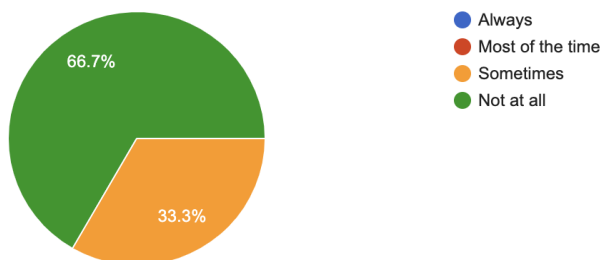
18 responses



Question 6:

Do you educate your patients to rub their hands with alcohol-based hand sanitizers for at least 20-30 seconds?

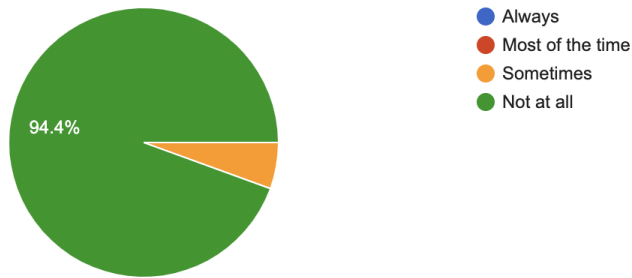
18 responses



Question 7:

Do you ask your patients, how they prefer to wash their hands?

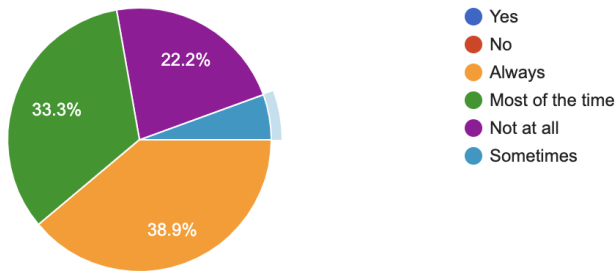
18 responses



Question 8:

Are you aware of the proper technique required for handwashing proposed by the World Health Organization?

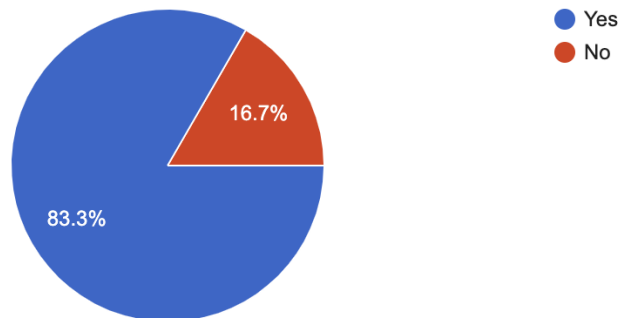
18 responses



Question 9:

Are you satisfied with your knowledge of hand hygiene?

18 responses



**Appendix J: Pre-intervention Questionnaire Patient Results**

			¿En cada visita, su proveedor/a le ha enseñado a lavarse las manos con jabón antes de comer y después de usar el baño?	¿En cada visita, su proveedor/a le ha enseñado que hay que lavarse las manos con jabón y agua de 40 a 60 segundos?	¿En cada visita, su proveedor/a le ha enseñado cómo secarse las manos con toalla de papel y usarla para cerrar la llave y abrir la puerta?	¿En cada visita, su proveedor/a le ha enseñado como frotarse las manos con alcohol y desinfectante por los menos de 20 a 30 segundos?	¿Está usted satisfecho/a con la educación que le ha dado su proveedor/a acerca de la higiene de sus manos?
Date	Patients initials		A. Siempre B. Algunas veces C. La mayoría del tiempo D. Ninguna de las veces	A. Siempre B. Algunas veces C. La mayoría del tiempo D. Ninguna de las veces	A. Siempre B. Algunas veces C. La mayoría del tiempo D. Ninguna de las veces	A. Siempre B. Algunas veces C. La mayoría del tiempo D. Ninguna de las veces	A. Satisfecho B. No satisfecho
EXAMPLE	J.G.		A	C	B	D	B
1	E.H.		A	A	A	A	A
2	10/12/20	M.A.	A	A	A	A	A
3	10/12/20	A. B. R.	D	D	D	D	B
4	10/12/20	M. C. S. L	A	A	A	A	A
5	10/12/20	C.R.	A	A	B	A	A
6	10/12/20	A.H	A	A	C	A	A
7	10/12/20	M.B.	D	A	A	D	A
8	10/12/20	C.W.	A	B	D	A	A
9	10/19/20	N.M.	D	D	D	D	B
10	10/19/20	M.S.	D	D	D	D	B
11	10/22/20	R.G.	D	D	D	D	B
12	10/22/20	J.C.	A	A	D	A	A

**Appendix K: Business plan**

	<b>Month 1 (Startup)</b>	<b>Month 2</b>
<b>Total Expense</b>	<b>\$848.00</b>	<b>\$493.00</b>
Pre survey(Online)	\$0.00	\$0.00
Post survey (Print)	\$20.00	\$0.00
Brochures 100/month	\$43.00	\$43.00
Unit poster	\$25.00	\$0.00
Unit Manager ( 8 hours)	\$480.00	\$0.00
Director ( 8 hours)	\$ 280.00	\$0.00
Staff training (Champions) 8 hrs/ month	\$0.00	\$400.00
Auditing personnel (RN)	\$0.00	\$50.00/month
<b>Total Saving</b>	<b>\$470.00</b>	<b>\$825.00</b>