Increasing the Knowledge of the Importance of Hand Hygiene Practices in Rural India

Ashley Grace Pursifull

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Increasing the Knowledge of the Importance of Hand Hygiene Practices in Rural India

by

Ashley Grace Pursifull

An Honors Capstone

submitted in partial fulfillment of the requirements

for the Honors Diploma

to

The Honors College

of

The University of Alabama in Huntsville

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Date 4/24/20
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Dedication

I want to dedicate this paper to my parents who have always encouraged me to travel the world, my best friend who shares in my adventures (Luke, my husband), my companions that accompanied me to India, and to the people of India.
Abstract

There is a deficit in hand hygiene education in rural India. Different studies have been conducted on ways to improve hand hygiene practices in rural India. Some studies were done with a focus on increasing knowledge through educational lecture, while others focus on behavioral components to increasing the practice of hand hygiene. After researching the evidence, a hand hygiene cube was constructed with the goal to improve education on hand hygiene practices for volunteers who are traveling to India. Nine volunteers were educated with a video presentation demonstrating on how to present the hand hygiene cube. Then, while they were in India, they presented the hand hygiene cube and filled out a survey on the use of the cube and the effectiveness of their teaching. Results included an overall increase of the knowledge of hand hygiene practices, based upon the survey done by the participants who presented or observed a presentation on the hand hygiene cube in rural India.
Introduction

Globally, two billion people do not have access to safely managed drinking water (World Health Organization [WHO], 2017). The WHO described safely managed drinking water as, “water from an improved water source that is located on premises, available when needed and free from fecal and priority chemical contamination” (2017, p. 8). Among the population of two billion, 300 million people live in the rural villages of India. Sixty-five percent of India’s rural population lacks a basic drinking water service. Basic drinking water service is characterized by water from a design that has the capacity to produce safe water and can be reached within 30 minutes round trip (WHO, 2017). With inadequate access to clean drinking water, there are limited ways to practice appropriate hand hygiene. Hand hygiene promotion is essential to decrease the spread of infection and disease. WHO defines hand hygiene as washing with a basin of soap and water or alcohol hand rub (2017). The purpose of this literature review is to determine if health education interventions are needed to increase the level of knowledge on the importance of hand hygiene promotion in rural India, specifically in individuals older than nineteen years of age. After reviewing this literature review, it was discovered there is still a need for hand hygiene education. A hand hygiene cube was created to enhance the education on hand hygiene. The purpose of this study was to examine the use and effectiveness of the hand hygiene cube as volunteers above the age of nineteen years old presented it in rural India.

Expanding upon the literature review, recent systematic studies examined the effect of health education interventions (e.g., group level talks, discussions, and demonstrations) and the level of knowledge of hand hygiene practices in rural India (Veerapu, Subramaniyan, Praveenkumar, & Arun, 2016). Other studies focused on recognizing the need for more hand hygiene education due to the lack of proper practices (Kuberan et al., 2015). Two studies focused
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on the importance of the promotion of using soap in handwashing (Biran et al., 2014; Rajaranan et al., 2014). Along with the promotion of soap, both articles also focused on behavioral changes that promoted hand hygiene, similarly to Seimetz, Kumar, & Moslet’s study in 2016. The purpose of these studies was to increase the knowledge and behavior of handwashing to decrease the spread of disease. Diarrheal diseases were the cause of 751,000 children’s deaths and pneumonia was the cause 1.07 million children’s deaths in a global review in 2010 (Rajaranan et al., 2014). Handwashing with soap can decrease the number of diarrheal infections by half, acute respiratory infections by 6-44%, (Rajaranan et al., 2014). Behavior change theories, such as the Change Theory, explain why some health education interventions may be more impactful than others (Trunnell & White, 2005). The Change Theory explores the causative actions behind how a person begins to prepare for a change, takes the action to change, and maintains the change (Trunnell & White, 2005). An investigation into the evidence found on hand hygiene promotion interventions in rural India with a focus on behavior change theories can elicit beneficial instructions to how nurses and health care providers communicate and educate patients from a multi-cultural dimension. In addition, exploring the rural India population looks beyond the United States health care system and creates a broader perspective for encouraging the improvement of health care on a global scale.

**Background**

In perspective of this conception of global health promotion, a cross-sectional study in rural Chennai, India, was conducted to analyze the knowledge, attitudes, and practices of water and sanitation hygiene (Kuberan et al., 2015). Study participants were 18 years old and older and 100 households were selected randomly. Data on handwashing practices, along with sociodemographic information, water facility, and water treatment and storage practices, were
obtained with a modified questionnaire. The findings support the urgency of handwashing interventions because the safe water supply is essential to proper hand hygiene practices. After observing the knowledge, attitude, and practices of water sanitation and hygiene, there is a clear need for further health education interventions.

With the purpose of investigating hand hygiene interventions, Seimetz and colleagues (2016) sought to improve the knowledge and practices of handwashing through a campaign called The Great WASH Yatra (TGWY). TGWY applied interventions that focused on hand hygiene education through amusement and games, such as dancing, singing, sports, and popular culture. Another aspect of the campaign examined if differences existed between those that participated in the handwashing games and those who did not. No significant difference in knowledge in the two cases was found. Therefore, the study concluded that further emphasis should be made on the significant behavioral determinants that affect handwashing (Seimetz et al., 2016). Other researchers also emphasize the need for more education on hand hygiene and have examined the effectiveness of health education interventions in rural India. One community-based study highlighted the need for hand hygiene promotion interventions in Kuppam, Andhra, Pradesh, South India (Veerapu et al., 2016). Overall, the health interventions on hand hygiene enhanced the knowledge, attitude, and practices of hand hygiene in Kuppam, Andhra Pradesh in rural India.

In 2011, two similar randomized controlled studies were initiated by obtaining a baseline knowledge of handwashing practices in Andhra Pradesh in southern India (Biran et al., 2014; Rajaranan et al., 2014). In contrast with previous studies mentioned, the interventions that Rajaranan and Biran (and their study teams) implemented were focused on behavioral change rather than health messages. Both studies sought to increase handwashing practice by connecting
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handwashing to emotional/psychological awards of good parenting and a successful status, by increasing the perception of the consequences of not washing their hands, and by creating a culture of handwashing as normative behavior. In conclusion, both studies observed that behavioral intervention was beneficial in promoting change in the perception and practices of handwashing. Furthermore, the researchers observed that the majority of the participants were already aware of the health benefits of handwashing, but that there is a need for deeper motivation to apply the knowledge which was promoted by a sense of reward for compliance (certificate, positive reinforcement) and a consequence for noncompliance (disease) (Biran et al., 2014; Rajaranan et al., 2014).

Review of the Evidence

The evidence found in this literature review on increasing the knowledge of hand hygiene practices in rural India was rendered by searching key words (e.g. hygiene, handwashing, education, India, interventions) in the University of Alabama in Huntsville’s Primo Pathfinder that incorporates hundreds of databases, such as PubMed and CINAHL. Primo Pathfinder utilizes thousands of journals and articles. Examples of journal databases that were incorporated were ProQuest and Gale. Additionally, studies were found in the references of these articles. An overview of this literature review is presented in a Review of Evidence Table (See Appendix F). A SWOT analysis was done to recognize the strengths, weaknesses, opportunities, and threats relating to increasing the knowledge of health hygiene in rural India (See Appendix G).

Researchers in Chennai, India, performed a randomized cross-sectional study of 100 participants to study the knowledge, attitude, and practices related to drinking water and sanitation facilities among rural India. Interventions included a modified questionnaire (Kubera...
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et al., 2015). The results of the study displayed that seventy-one percent of participants agreed that health status can be affected by the quality of water, forty-five percent of the participants were not following any practices of water treatment, twenty-five percent of participants did not have access to toilets inside their homes, and thirty-two percent felt that hands should be washed after using the restroom. The strengths of the study are that the researchers included the intervention of education on sanitation, water treatment, and handwashing practices. The limits to the study were the smaller sample size and that it was limited to one geographical location (Kuberan et al., 2015).

In a qualitative survey done in northern India researchers aimed to assess the effectiveness of TGWY handwashing awareness raising campaign (Seimetz et al., 2016). This campaign used the positive power of cricket, fun games and Bollywood celebrities to promote handwashing. The sample included 687 participants older than sixteen. The interventions included structured interviews using a pre-coded and pre-tested questionnaire. The results concluded that the campaign had a medium effect on the participants’ knowledge on the positives of handwashing, based on risks, attitudes, norms, abilities, self-regulation (Mosler’s RANAS model of behavior change). One of the strengths of this study is that it claims to be the first study to evaluate a large-scale handwashing campaign by seeking to understand the behavioral determinants (Seimetz et al., 2016). The limits to this study were a limited number of participants in a game and not being able to determine the effect for each individual intervention.

A multi-stage random sampling community-based interventional study in Pradesh, India, sought to study the level of knowledge, attitudes, and practices on sanitary latrine, footwear, and handwashing among rural people after an educational intervention (Veerapu et al., 2016). Researchers took a random sample of 300 individuals over the age of fifteen from villages with
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over two hundred households in Gram Panchayats. The intervention included a 30-45-minute lecture on disease transmission and the importance of hand hygiene. Individuals participated in interactive learning with flip charts, pictures, and health messages. The knowledge that handwashing with soap decreases the transmission of disease increased from 41% to 91.6%. The practice of handwashing before cooking food increased from 29.7% to 81.3%, before food intake 45% to 87.3%, after toilet use 54% to 95.3% and with the presence of soap 32.7% to 69.8% (Veerapu et al., 2016). The results portrayed an increase in the overall knowledge, attitudes, and practices of hand hygiene in post-test 1 and post-test 2 (P1 < 0.0001, P2 < 0.0001). The strengths of the study are a small p-value and the use of a multistage random sample technique to reduce bias and error. The limit to this study was the small-time gap in post-test 1 and post-test 2 surveys, resulting in a small difference between the test results (Veerapu et al., 2016).

In a cluster-randomized trial of 14 villages in Pradesh, India, researchers aimed to test whether a measurable village-level intervention based on emotional drivers of behavior, rather than knowledge, could improve handwashing behavior in rural India (Biran et al., 2014; Rajaranan et al., 2014). The interventions were a semi-structured interview questionnaire and community and school-based events including animated film, skits, and public pledging ceremonies. This study showed there was an increase in handwashing due to emotional drivers. The results of Rajaranan’s study revealed that 95% of respondents in the intervention villages reported that handwashing after defecation and before eating are important occasions compared to 12 to 29% in the control villages. Biran’s results supported Rajaranan’s findings with different specific statistical data. For example, the neglect of no handwashing decreased from 79% to 57% and further decreased to 37%. The strengths were the randomization, the inquiry into the understanding of the drivers, and the design process to analyze the insights. The limits of this
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experiment were that the researchers were not able to distinguish between the different components of the interventions, such as if nurture, status, or affiliation was the most important emotional driver (Biran et al., 2014; Rajaranan et al., 2014).

**Theoretical Framework**

According to the evidence found, the need for behavior change compared to knowledge is a reoccurring theme when examining handwashing practices. Several studies suggest there is a need for more inquiry into behavioral determinants that affect hand hygiene, rather than health promotion lectures (Trunnell & White, 2005). One theory that applies this information is the Stage of Change theory explained by Prochaska in 1994. Stages of Change theory (SOC) portrays a systematic yet psychological process of the application of thinking to doing. This is critical when it comes to interventions to promote appropriate handwashing because the goal is to provide knowledge that inspires the client to action and maintenance of proper handwashing techniques (Trunnell & White, 2005).

Stages of Change Model are as follows: pre-contemplation, contemplation, preparation, action, maintenance, and termination (Trunnell & White, 2005). As part of the first stage, pre-contemplation, participants, such as those living in rural India, must be willing to recognize the issue. They are presented with the consequences and rationales behind the issue of inappropriate handwashing. For example, the absence of handwashing can cause diarrheal diseases, which are one of the leading causes of infectious deaths in children younger than 5 years old in India (Rajaranan et al., 2014). These facts may lead to contemplation, in which the participant recognizes that change needs to occur but is hesitant or unable to initiate the change. In regard to rural India, being unable to change is often due to the lack of clean water to improve
handwashing techniques. If those barriers are removed, the participant can move into preparation. In the preparation stage, plans are implemented to promote handwashing practices (e.g. buying soap to prepare for adequate handwashing). The next stage is action, during which the participant takes the first step to implement the handwashing. In this stage, cues, rewards, and reminders, such as a poster or pledge, prompt the client to practice handwashing.

Maintenance occurs after action. This could be encouraged by a reward, such as a certificate or honor that positively reinforces the client to continue to wash their hands. Although termination is the final stage it is not an appropriate stage for handwashing because handwashing should be maintained always (Trunnell & White, 2005).

Methodology

Participants

Nine volunteer workers who were going on a trip to rural India that were older than 19 years of age volunteered to participate in this study. Participants who were willing and signed a consent form (Appendix D) were trained in using an educational cube on best hand hygiene practices. They watched a 5-minute video demonstrating how to use the cube and practiced using and explaining the cube. The verbal and video script and initial contact with the participants are located in Appendix A.

Materials

An informational cube was used to demonstrate the hand hygiene education (Appendix B). The questionnaires used were a survey on the use of the hand hygiene cube (Appendix C) and a demographics survey was completed (Appendix E). The hand hygiene cube survey was
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based on the Likert scale. It was taken by the participants, based on the response of the teaching, the effectiveness of the knowledge presented, and the usability of the resource.

**Design**

This design is a quantitative research design based on a survey through the Likert scale. Participants were chosen through convenience sampling. There is recognition in the bias and errors that can occur in convenience sampling.

**Procedures**

Participants that were willing were trained on presenting an educational cube on hand hygiene practices through a demonstration video and in-person discussion. The participants then were given a cube to take with them when they went on their trip to rural India. While in the homes of individuals, they presented their hand washing cube. The number of homes they presented the cube varied based on the participants and their opportunities and conversations. Towards the end of their trip, they were given a survey evaluating the response from the hand hygiene teaching, the effectiveness of the cube, and the usability of the tool. Next, this data was gathered and complied to be a next stepping point to increasing hand hygiene practices in rural India.

**Results**

The demographics of this study involved nine participants between the ages of 25 to above 65. The participants classified themselves as White, Asian, and Pacific Islander. There were five females and four males. Participants were a mix of Non-Hispanic or Latino and Hispanic or Latino. The participants presented or watched a presentation of the hand hygiene
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cube in rural India and filled out a survey about the use and effectiveness of the hand hygiene cube. The statements that were asked are described in Appendix C using a Likert scale and the results of the study are presented in Table 1. The missing data point under participant nine showed on the data was a result of no answer being given on that statement. The participants circled either a one, two, three, or four. One corresponded with strongly disagree. Two represented disagree. Three equaled agreeing to the statement. Four was equivalent to strongly agreeing. In Chart 1 the average response from all participates on that statement was recorded and displayed on a bar graph. The most reoccurring answer was strongly agree. The average response of the answers given was between agree and strongly agree which was represented by the number 3.54. These results cannot confirm or deny that the presentation of the hand hygiene cube increased the knowledge of hand hygiene because this is through the perception of the participants presenting the cube and not the individuals themselves learning. The results portrayed that every participant agreed to these three statements. The first statement read, “As I was presenting the hand hygiene cube, the individuals were attentive and listening. Each participant agreed or strongly agreed to that statement, for an average of 3.78 on the Likert scale. The second statement was, “I think the individuals gained knowledge on the importance of hand hygiene practices.” Likewise, each participant agreed or strongly agreed to that statement, for an average of 3.78 on the Likert scale. Lastly, the statement described that “There was evidence that the individuals were motivated to improve hand hygiene practices.” Each participant agreed or strongly agreed to that statement, for an average of 3.78 on the Likert scale. The lowest scoring statement was “I gained knowledge of hand hygiene practices I did not know before.” Some participants agreed with this statement and others disagreed, with an average of 3 on the Likert scale. In conclusion, there was limited data but the data that was recovered revealed that the
participants agreed that the individuals in rural India were engaged in the presentation, gained knowledge, and were motivated to practice good hand hygiene. Further research must be done to confirm that the hand hygiene cube increased the knowledge of hand hygiene practices in rural India.

**Limitations**

Limitations in this study during the formation of the hand hygiene cube included funding and shipment of the cubes. More participants could have been involved in the study if the hand hygiene cubes would have arrived sooner. The number of participants was a limitation to this study. Nine participants are not enough to draw conclusions about the population of rural India. The principle investigator had to wait on funding in order to order the cubes. Other limitations during the study included the principal investigator not being able to observe the participants demonstrating the hand hygiene cube in rural India. The participants were the ones presented the hand hygiene cube, rather than the individuals whom the hand hygiene cube was presented to. Some of the participants observed the individuals presenting the cube rather than presenting it themselves. Some of the participants circled and scratched through their answers on the survey, making it difficult to see their answers. Due to the results being in a survey form through convenience sampling, bias is more likely to occur. Another limitation was participant nine did not record a response for the statement, “During the presentation individuals were engaged and asked thought questions.” This no-response could have changed the data results.

**Discussion**

After researching the practices of hand hygiene rural India, evidence suggests there is a need for improving hand hygiene. The goal of the hand hygiene cube was to increase the
knowledge of hand hygiene practices in rural India. From the results of the nine participants that presented the hand hygiene cube, there were results that explained how the individuals in rural India gained knowledge and were motivated to improve hand hygiene practices. The data presented was recorded from the participants that presented or observed a presentation of the hand hygiene cube. This data cannot confirm or deny the increased knowledge of the individuals statistically. Further research should be done with the hand hygiene cube with the individuals in which the hand hygiene cube was presented to. The knowledge of the individuals should be observed before the hand hygiene cube demonstration and then afterwards to compare the effectiveness of the cube. Also, evidence supports there should be more than just knowledge given, but implications and reminders for a behavior change.

Implications for Practice

Nurses are health educators among hospitals, schools, clinics, and communities. Health education on the importance of handwashing is critical to reducing the spread of infectious diseases (Biran et al., 2014; Rajaranan et al., 2014). Protocols and evidence-based guidelines describe best practices for hand hygiene. WHO’s handwashing protocol presents the best practice of handwashing to be for 20-30 seconds with a variety of scrubbing techniques (2009). These techniques include scrubbing the top, bottom, in-between fingers, wrists, and nails. Although this protocol was developed in 2009, this is protocol is still utilized as the best practice and is essential when observing the review of evidence on a global scale. Furthermore, this protocol emphasizes the importance of handwashing in developing countries like India (See Appendix H). Following protocols and evidence-based guidelines on hand hygiene and educating patients on these protocols will improve overall patient health and decrease the spread of disease.
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(WHO, 2009). Barriers in implementing this protocol include language and cultural barriers, lack of resources, and ineffective interventions.

Studies such as, Biran and colleagues’ (2014) randomized control trial, suggest that there is a greater need for interventions that affect behavioral components to handwashing rather than knowledge-based lectures. Nurses play a key role in the encouragement of behavior change among individuals. For example, nurses and other health care professionals implicate the use of praise/reward when individuals showed appropriate handwashing techniques, and this leads to an increase in handwashing in their facility. Another example would be appealing to an individual’s fear, such as fear of disease to encourage the use of handwashing. More research should be conducted to determine which emotional trigger is most effective for encouraging the use of handwashing (Biran et al., 2014; Rajaranan et al., 2014).

Conclusion

Adequate handwashing practices are fundamental to reducing the risk of infectious disease transmission, not only in India, but globally. Handwashing with soap can save over 600,000 lives a year by decreasing the number of diarrheal and respiratory infections (Rajaranan et al., 2014). Patient education on the benefits and consequences of handwashing is the first step. The hand hygiene cube can be a resource used to present good hand hygiene practices. More evidence is needed to examine the hand hygiene cube’s effectiveness on increasing hand hygiene practices in rural India. Worldwide, evidence suggests there has been an increase in the knowledge on hand hygiene practices (Veerapu et al., 2016). After recognizing the need, further interventions must be done to implement behavioral changes within a community. Within the nursing field, appropriate education of hand hygiene is essential to reducing the transmission of
diseases. Furthermore, learning the application behind conceptualizing the need for behavioral changes over a health management lecture is the beginning of a critical thinking mindset. Taking into consideration behavioral determinants opens the mind to psychological aspects that can often be overlooked. Handwashing interventions have been effective in increasing the level of knowledge on hand hygiene promotion in rural India, but there is a need for future research to further investigate the behavioral determinants that impact the psychological aspects of handwashing.

Dissemination of Scholarly Work

The dissemination plan was as follows. As a way to communicate this research study to administrators, peers, and professionals the principal investigator planned on presenting in the Research Horizons Day and Research Week. This event was planned for March 16-20, 2020. Abstract or poster submissions were due January 31, 2020 and 12 pm. This was the plan, but this did not take place. The crisis of COVID-19 occurred and canceled all future opportunities to disseminate the scholarly work face-to-face. This is the link to the presentation of the hand hygiene cube on YouTube https://www.youtube.com/watch?v=ZzRtBkQiUuE. There may be future opportunities for the dissemination of scholarly work, but none have taken place at this time.
References


Table 1

<table>
<thead>
<tr>
<th>Statement</th>
<th>Average</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was educated well on how to use the hand hygiene cube.</td>
<td>3.666667</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I felt confident in teaching hand hygiene using the hand hygiene cube.</td>
<td>3.666667</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I gained knowledge of hand hygiene practices that I did not know before.</td>
<td>3.333333</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>As I was presenting the hand hygiene cube, the individuals were attentive and listening.</td>
<td>3.777778</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>During the presentation individuals were engaged and asked thoughtful questions.</td>
<td>3.125</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I think the individuals gained knowledge on the importance of hand hygiene practices.</td>
<td>3.777778</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I think the individuals saw the need for good hand hygiene in their country, specifically.</td>
<td>3.555556</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>There was evidence that the individuals were motivated to improve their hand hygiene practices.</td>
<td>3.777778</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
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</tr>
</tbody>
</table>

Chart 1

Hand Hygiene Cube Use

- I was educated well on how to use the hand hygiene cube.
- I felt confident in teaching hand hygiene using the hand hygiene cube.
- I gained knowledge of hand hygiene practices that I did not know before.
- As I was presenting the hand hygiene cube, the individuals were attentive and listening.
- During the presentation individuals were engaged and asked thoughtful questions.
- I think the individuals gained knowledge on the importance of hand hygiene practices.
- I think the individuals saw the need for good hand hygiene in their country, specifically.
- There was evidence that the individuals were motivated to improve their hand hygiene practices.
Appendix A

Initial Contact Scripts

Hello Mrs. Mary!

I am doing a research project for my UAH honors class that deals with improving hand washing practices in rural India. I plan on making an informational cube, like the malaria one! I was wondering if it would be possible to take a couple on a trip to India in January. Then I would just give you a quick survey on the effectiveness of the product. Your opinion of ease of use and how it could be better would be very valuable to me. I understand that you are a busy professional, but I’m hoping this informational cube will make a part of the work you do in India more efficient and effective.

Thank you,

Ashley Pursifull

Response:

Absolutely. We are going in November too if it's ready then!

Just arrived home from India!
Verbal Script for Recruitment

The PI, Ashley Pursifull, will say:

“Hello! I am excited for you as you get ready for your trip to India. My name is Ashley Pursifull Whaley. I am an Honors Nursing Student at UAH. I am researching ways to increase hand hygiene education in rural India. There is a great need for this education. The lack of access to clean water and health education accounts for India haven’t one of the highest infectious rates, according to the World Health Organization. I have designed a hand hygiene educational cube to help educate on the practice of hand washing and on the importance. My study would involve participants gaining education in how to present the cube, presenting the cube in rural India, and filling out a survey on how effective the presentation was and how the tool could be better. I will give you the information on how to present the cube through a video that you had have access to if you needed extra time to learn. Would you be willing to participate in my study? If so, I have a form you will need to sign, giving me permission to include you in this study.”
Video Script

“Here is an example of how to present the hand hygiene cube: Infectious diseases can spread in many ways, through the air, through droplets, and through contact. The number one way to prevent infectious diseases is proper hand hygiene. India has one of the highest rates for outbreaks of infectious diseases. This map displays the results of that study. It is according to color, and India is one of the darkest colors. It is important to have adequate supplies for handwashing. Clean water and soap or hand sanitizer are important to obtain. The first step in proper hand hygiene is to soak your hands in warm water. Step 2 is to squirt soap on your wet hands. Step 3 is very important. Step 3 involves 20 seconds of scrubbing the fronts of hands, backs of hands, wrists, and underneath the nails. Step 4 is rinsing your hands under the warm water, getting all the soap off of your hands. Lastly, step 5 is drying your hands completely. These steps will ensure proper hand hygiene and can reduce the spread of infectious diseases. Did you learn something from this demonstration?”
Appendix B

Pictures of Cube
Increasing the Knowledge of Hand Hygiene Practices
Increasing the Knowledge of Hand Hygiene Practices

1. Wash hands with soap and water for at least 20 seconds.

2. Use hand sanitizer if soap and water are not available.
Increasing the Knowledge of Hand Hygiene Practices

3.

4.
### Increasing the Knowledge of Hand Hygiene Practices

#### Appendix C

**Survey**

Use of the Hand Hygiene Cube

Please respond to each statement by circling one number per row.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was educated well on how to use the hand hygiene cube.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I felt confident in teaching hand hygiene using the hand hygiene cube.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I gained knowledge of hand hygiene practices that I did not know before.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As I was presenting the hand hygiene cube, the individuals were attentive and listening.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During the presentation individuals were engaged and asked thoughtful questions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think the individuals gained knowledge on the importance of hand hygiene practices.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think the individuals saw the need for good hand hygiene in their country, specifically.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There was evidence that the individuals were motivated to improve their hand hygiene practices.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please provide any suggestions for additions to the hand hygiene cube.
Please provide any suggestions for deletions to the hand hygiene cube.
Appendix D

Consent Form

Consent Form: Increasing the Knowledge of Hand Hygiene Practice in Rural India

You are invited to participate in a research study about hand hygiene knowledge and practices in rural India. This study is designed to help us to better understand how increasing the knowledge of hand hygiene practices can improve practices and therefore, decrease the spread of infectious diseases in rural India.

The primary investigator is Ashley Pursifull, from the University of Alabama in Huntsville.

PROCEDURE TO BE FOLLOWED IN THE STUDY: Participation in this study is completely voluntary. Once written consent is given; you will be asked to watch a video explaining how to demonstrate the hand hygiene cube. Then, while in India you will present the cube and fill out a survey of effectiveness and usability of the cube. This session will take 10 minutes to explain and 5 minutes to demonstrate while in India, and 5 minutes to fill out the survey. Overall the session will take 20 minutes.

DISCOMFORTS AND RISKS FROM PARTICIPATING IN THIS STUDY: There are no expected risks associated with your participation. There may be discomforts with presenting with a translator in rural India.

EXPECTED BENEFITS: Results from this study can benefit society by experiencing new cultures and educating individuals on handwashing. They will also gain the knowledge on hand hygiene themselves. After obtaining the results on the benefits of this educational tool, there could be further use of it in educating hand hygiene in any country, therefore, reducing the number one way infections spread. Please see the section below for incentives and compensation for participation in this study.

INCENTIVES AND COMPENSATION FOR PARTICIPATION: There are no incentives or compensations for this research study.
CONFIDENTIALITY OF RESULTS: Participant numbers will be used to record your data, and these numbers will be made available only to those researchers directly involved with this study, thereby ensuring strict confidentiality. This consent form will be destroyed after 3 years. The data from your session will only be released to those individuals who are directly involved in the research and only using your participant number.

FREEDOM TO WITHDRAW: You are free to withdraw from the study at any time. You will not be penalized because of withdrawal in any form. Investigators reserve the right to remove any participant from the session without regard to the participant’s consent.

CONTACT INFORMATION: If you have any questions, please ask them now. If you have questions later on, you may contact the Principal Investigator Ashley Pursifull, in Athens, AL, at 256-617-0098 or at agp0011@uah.edu. If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact the Office of the IRB (IRB) at 256.824.6992 or email the IRB chair Dr. Ann Bianchi at irb@uah.edu.

If you agree to participate in our research please sign and date below. If you are under the age of 18, please provide your parent or legal guardian’s signature indicating consent.

This study was approved by the Institutional Review Board at UAH and will expire in one year from <date of IRB approval>.

________________________________________________________________________
Name (Please Print)                                        Signature           Date

________________________________________________________________________
Parent/Guardian Signature (if younger than 18)
Appendix E

Demographic Questionnaire

Please provide the following information as part of your participation in Increasing the Knowledge of the Importance of Hand Hygiene Practice in Rural India study. These answers will remain confidential. It should take approximately 2 minutes to complete this questionnaire.

Please mark your gender.

Male ____
Female _____

Please select the category that includes your age.

__ Under 19
__ 19-24
__ 25-34
__ 35-44
__ 45-54
__ 55-64
__ 65 or Above

Please mark your race.

__ African American/Black
__ American Indian/Alaskan Native
__ Asian
___ Caucasian/White

___ Pacific Islander

___ Multiracial

___ Other, please indicate. ____________________

Please mark your ethnicity.

___ Hispanic or Latino

___ Not Hispanic or Latino
### Appendix F

**Review of Evidence Table**

<table>
<thead>
<tr>
<th>Study Author/year/title</th>
<th>Objective Aim/Purpose</th>
<th>Research design/Sample/Setting</th>
<th>Intervention (competencies &amp; methods)</th>
<th>Instruments &amp; data collection methods</th>
<th>Study findings/results</th>
<th>Strengths</th>
<th>Limitations</th>
<th>Implications and recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author:</strong> Biran et al. <strong>Year:</strong> 2014 <strong>Title:</strong> Effect of a behaviour-change intervention on handwashing with soap in India (SuperAnna): a cluster-randomized trial</td>
<td>Tested whether a scalable village-level intervention based on emotional drivers of behavior, rather than knowledge, could improve handwashing behavior in rural India.</td>
<td><strong>Design &amp; Sample:</strong> Cluster-randomized trial/sample of 14 clusters (villages) with 25 households per cluster n=348 households</td>
<td>14 villages (clusters) were selected, stratified by population size (&lt;1200 vs &gt;1200), and randomly assigned in a 1:1 ratio to intervention or control (no intervention). Clusters were enrolled by the study manager. Random allocation was done by the study statistician using a semi-structured interview, questionnaire; The intervention included community and school-based events incorporating an animated film, skits, and public pledging ceremonies.</td>
<td>This study shows that substantial increases in handwashing with soap can be achieved using a scalable intervention based on emotional drivers.</td>
<td>Attention paid to understanding the drivers of handwashing behavior and a design process that allowed full use of these insights.</td>
<td>We are not able to distinguish the effects of the different components of the intervention, for example, whether disgust, nurture, status, or affiliation was the most important driver of behavior change. Neither can we say for whether the observed increase in handwashing with soap is sufficient to reduce infection remains unclear. The promising effect of this intervention on school-aged children suggests that hygiene promotion might need to be planned long term, with the full potential perhaps only realized once schoolchild...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Increasing the Knowledge of Hand Hygiene Practices

and Sept 10, 2012. Eligible villages had a population of 700–2000 people, a state-run primary school for children aged 8–13 years, and a preschool for children younger than 5 years.

random number generator.

how long the effects of the campaign will last. ren become parents.
<table>
<thead>
<tr>
<th>Kuberan et al., 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Water and sanitation hygiene knowledge, attitude, and practices among household members living in rural setting of India</td>
</tr>
</tbody>
</table>

**Design:** Cross-sectional study

**Sample:** n=100 >18 years old

**Setting:** Thandalam village, Chennai, India

A modified questionnaire was prepared from the existing validated tools. It consisted of followin content. 100 households were selected randomly and one member from each household was enrolled as participant.

Forty-five percent of the participants were not followin any methods of water treatme nt and among them half of the participants felt that water available to them was clean and did not require any additio nal treatment. Twenty-five percent of the participants surveyed did not have access to

The study does identify the need for intervention program to educate the population regardin g sanitation, water treatmen t methods, and handwas hing practices.

First it include d smaller sample size and the study design was cross-sectiona l. Further the study was limited to one geograp hical location; hence, the results of the study should not be generali zed.

The study stressed the need of sanitary education. There is also a need for developing cost effective water testing devices to record seasonal variations in water quality in rural areas.
<table>
<thead>
<tr>
<th>Rajaraman et al., 2014</th>
<th>This study carried out a process evaluation to assess the implementation of the intervention and the evidence that it had changed the perceived benefits and social norms associated with handwashing with soap.</th>
</tr>
</thead>
</table>
| **Title:** Implementing effective hygiene promotion: Lessons from the process evaluation of an intervention to promote handwashing with soap in rural India | **Design:** Randomized control trial; qualitative data  
**Sample:** 7 villages, n=354  
**Setting:** Andhra Pradesh, India  
**SuperAMA** intervention is a community-based intervention that creates a culture of handwashing as normative behavior. The study used semi-structured interviews and | **Toilets inside their household.** |
|  |  |  
|  | **We found that the intervention was largely acceptable to the target population, maintained high fidelity (after some starting problems), and resulted in a high level of exposure to most common** |
|  |  | **The process evaluation showed that the intervention achieved good fidelity, acceptability and reach across men and women of varied social and economic status, and a shorter, equally effective version of the intervention.**  
**A limitation of this study is our inability to separate the individual contributions made by different activities to the overall effect of the intervention, or to assess the impact of the intervention in a different cultural setting and environment would need to be preceded by pilot research to confirm the acceptability and feasibility of key elements across population groups.** |
Increasing the Knowledge of Hand Hygiene Practices

<table>
<thead>
<tr>
<th>Questionnaires</th>
<th>Control</th>
<th>Intervention</th>
<th>Recall of intervention activities</th>
<th>Recall of reason for HWWS</th>
<th>Recall of HWWS as a social norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 households</td>
<td>100</td>
<td>100</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
</tr>
</tbody>
</table>

There was a high recall of intervention activities. Subjects in intervention villages were more likely than those in control villages to cite reasons for HWWS that were in line with intervention messaging and to believe that HWWS was a social norm. Intervention could be delivered at an estimated cost of about $1,097 per village.

Changes in exposure to intervention activities were assessed on an estimated cost of about $1,097 per village.
<table>
<thead>
<tr>
<th>Seimetz, E., Kumar, S., &amp; Moslet, H. J. 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Effects of an awareness raising campaign on intention and behavioral determinants for handwashing</td>
</tr>
<tr>
<td><strong>Design:</strong> Qualitative data: surveys</td>
</tr>
<tr>
<td><strong>Sample:</strong> &gt; 16 years of age n=687</td>
</tr>
<tr>
<td><strong>Setting:</strong> Rural parts of northern India</td>
</tr>
</tbody>
</table>

This study assesses the effectiveness of The Great WASH Yatra (TGWY) handwashing awareness raising campaign in India on changing visitors’ intention to wash hands with soap after using the toilet and the underlying behavioral determinants.

TGWY engaged visitors in a fun and playful way using the positive power of cricket, fun, games and Bollywood celebrities to promote life-saving handwashing behavior in rural parts of northern India. A campaig n visit had a medium effect on the visitors’ knowledge about the benefits of washing hands and a small to medium effect on their certainty that washing hands with soap and water after using the toilet protects them and their family from diarrhea. To the best of knowledge, this is the first study to evaluate a large-scale handwashing campaign by assessing its immediate effect on participants’ intention to wash hands and the underlying behavioral determinants.

Data were collected over a 5-week period, from October 14 through 19 November 2012, within five stations of TGWY by means of structured interviews using a standardized, pre-coded and pre-tested questionnaire administered in paper-and-pencil. Due to the limited number of respondents who had participated in a particular game, it was not possible to study the effect for each individual activity.

Successful interventions will have to address the relevant behavioral determinant s for handwashing, including perceived and actual barriers that might hinder handwashing performance.
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Promotion of sanitation and hygiene in a rural area of South India: A community-based study</td>
</tr>
<tr>
<td>The objectives of the study were to find out the level of knowledge, attitudes, and practices (KAPs) on sanitary latrine, footwear, and handwashing among rural people and to assess the improvement in KAP after health education intervention.</td>
</tr>
<tr>
<td><strong>Design:</strong> Multistage random sampling, community-based interventional study</td>
</tr>
<tr>
<td>Each health education session was a group level interactive lecture for 30–45 min using flip charts containing pictures and health messages. Each group consisted of about 5–10 study subjects and other persons in the locality. The dynamics of disease transmission was explained, and the importance of personal hygiene was stressed.</td>
</tr>
<tr>
<td><strong>Sample:</strong> n=300 &gt;15 years old</td>
</tr>
<tr>
<td>All Gram Panchayats in Kuppam Mandal were selected. One Gram Panchayat was selected. There were five villages in Gram Panchayat. Out of five, three villages each having more than two hundred households was selected by simple random sampling. In each village, randomly households were selected until the number of subjects in post test-1 and post test-2 (P1 &lt; 0.0001, P2 &lt; 0.0001), respectively.</td>
</tr>
<tr>
<td><strong>Setting:</strong> Kuppam, Andhra, Pradesh, South India</td>
</tr>
<tr>
<td>After the intervention, there was a significant improvement in the overall KAPs among the subjects in post test-1 and post test-2 (P1 &lt; 0.0001, P2 &lt; 0.0001), respectively.</td>
</tr>
<tr>
<td>The design of the study, a multistage random sample, is a strength to the study because it decreases error and bias in the sampling process. Also, the significance of the p value being very small increases the strength of the study.</td>
</tr>
<tr>
<td>This study is limited as post test-1 and post test-2 surveys were conducted with a gap of a few months because of time constraint and so there was not much difference between post test-1 and post test-2 results.</td>
</tr>
<tr>
<td>Health education made the people to realize their unfelt needs. There should be regular follow-up visits and repetition of health education to bring and sustain the positive healthy behavior in the community. The questionnaire needs to be further standardized.</td>
</tr>
</tbody>
</table>
Increasing the Knowledge of Hand Hygiene Practices

| ce of sanitatio n and hygiene was emphasized | of households hundred was reached. Then, one person from the selected household aged 15 years and above was selected randomly and interview ed. |   |   |   |
## Appendix G

**SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Decrease transmission of diseases</td>
<td>• Lack of education</td>
</tr>
<tr>
<td>• Improving education on hand hygiene practices</td>
<td>• Lack of resources</td>
</tr>
<tr>
<td>• Increasing overall quality of life</td>
<td>• Lack of availability of health care providers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Incorporating behavioral changes across communities</td>
<td>• Financial needs</td>
</tr>
<tr>
<td>• Experiencing unique health practices</td>
<td>• Accessibility to area that are in need of this education</td>
</tr>
<tr>
<td>• Improving cleanliness</td>
<td>• Access to translators</td>
</tr>
<tr>
<td></td>
<td>• Language barriers</td>
</tr>
<tr>
<td></td>
<td>• Cultural barriers</td>
</tr>
</tbody>
</table>

Figure 1. SWOT Analysis. A SWOT analysis is a useful method that can help identify the strengths, weaknesses, opportunities, and threats relating to your shared purpose or an aspect of care that you want to improve.
Appendix H

Evidence Based Protocol/Guideline

Hand Hygiene Technique with Alcohol-Based Formulation

1. **Duration of the entire procedure:** 20-30 seconds

2. **Apply a palmful of the product in a cupped hand, covering all surfaces;**

3. **Rub hands palm to palm;**

4. **Right palm over left dorsum with interfaced fingers and vice versa;**

5. **Palm to palms with fingers interlaced;**

6. **Backs of fingers to opposing palms with fingers interlocked;**

7. **Rotational rubbing of left thumb clasped in right palm and vice versa;**

8. **Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;**

9. **Once dry, your hands are safe.*
Hand Hygiene Technique with Soap and Water

**Duration of the entire procedure:** 40-60 seconds

1. Wet hands with water;
2. Apply enough soap to cover all hand surfaces;
3. Rub hands palm to palm;
4. Right palm over left dorsum with interlaced fingers and vice versa;
5. Palm to palm with fingers interlaced;
6. Backs of fingers to opposing palms with fingers interlocked;
7. Rotational rubbing of left thumb clasped in right palm and vice versa;
8. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
9. Rinse hands with water;
10. Dry hands thoroughly with a single use towel;
11. Use towel to turn off faucet;

Your hands are now safe.
Increasing the Knowledge of Hand Hygiene Practices

WHO GUIDELINES ON HAND HYGIENE IN HEALTH CARE

3. The burden of health care-associated infection

This section summarizes the epidemiological data and relevant issues related to the global burden of health care-associated infection (HCAI) and emphasizes the importance of preventing HCAI by giving priority to the promotion of hand hygiene best practices in health care. When available, national or multisite data used to be preferred to single hospital surveys, and only studies or reports published in English were considered. This overview of available data on HCAI is therefore not to be considered exhaustive, but rather as an informative, evidence-based introduction to the topic of hand hygiene in health care.

HCAI is a major problem for patient safety and its surveillance and prevention must be a first priority for settings and institutions committed to making health care safer. The impact of HCAI implies prolonged hospital stay (long-term disability), increased resistance of microorganisms to antimicrobials, massive additional financial burden, high costs for patients and their families, and excess deaths. Although the risk of acquiring HCAI is universal and pervades every health-care facility and system around the world, the global burden is unknown because of the difficulty of gathering reliable diagnostic data. Overall estimates indicate that more than 1.4 million patients worldwide in developed and developing countries are affected at any time. Although data on the burden of diseases worldwide that are published in WHO’s World Health Reports inform HCWs, policymakers, and the public of the most important diseases in terms of mortality and morbidity, HCAI does not appear on the list of the 100 diseases evaluated. The most likely reason is that the diagnosis of HCAI is complex, relying on multiple criteria and not on a single laboratory test. In addition, although national surveillance systems exist in many industrialized countries, e.g., the National Nosocomial Infections Surveillance System in the United States of America (USA) [http://www.cdc.gov/nosocomial/gniss.html], they often use different diagnostic criteria and methods, which render international comparisons difficult due to benchmarking obstacles. In developing countries, such systems are seldom in place. Therefore, in many settings, from hospitals to ambulatory and long-term care, HCAI appears to be a hidden, cross-cutting concern that no institution or country can claim to have solved as yet.

For the purpose of this review on the HCAI burden worldwide, countries are ranked as “developed” and “developing” according to the World Bank classification based on their estimated per capita income [http://siteresources.worldbank.org/DATASTATISTICS/Resources/CLASSIFIC].

3.1 Health care-associated infection in developed countries

In developed countries, HCAI concerns 5–15% of hospitalized patients and can affect 9–37% of those admitted to intensive care units (ICUs). Recent studies conducted in Europe reported hospital-wide prevalence rates of patients affected by HCAI ranging from 4.8% to 9.3%. According to data provided by the Hospital in Europe Link for Infection Control through Surveillance (HELICS) [http://helics.unibe.ch/Helics.html], approximately 6 million HCAIs are estimated to occur in acute care hospitals in Europe annually, representing around 25 million extra days of hospital stay and a corresponding economic burden of €13–24 billion. In general, attributable mortality due to HCAI in Europe is estimated to be 1% (50,000 deaths per year), but HCAI contributes to death in at least 2.7% of cases (935,000 deaths per year). The estimated HCAI incidence rate in the USA was 4.2% in 2002, corresponding to 9.3 infections per 1000 patient-days and 1.7 million affected patients; approximately 99,000 deaths were attributed to HCAI. The annual economic impact of HCAI in the USA was approximately US$6.5 billion in 2004.

In the USA, similar to the position in other industrialized countries, the most frequent type of infection hospital-wide is urinary tract infection (UTI) (59%), followed by surgical site infection (SSI) (20%), bloodstream infection (BSI), and pneumonia (both 11%). It is noteworthy, however, that some infection types such as SSI and ventilator-associated pneumonia have a more severe impact than others in terms of mortality and extra-costs. For instance, the mortality rate directly attributable to BSIs in ICU patients has been estimated to be 16–40% and proportionally of the length of stay 7.5–25 days. Furthermore, nosocomial BSIs account for 250,000 episodes every year in the USA, and it has been shown to reduce inpatient stays by the overall cost of HCAI. In ICU settings, particularly the use of various invasive devices (e.g., central venous catheter, mechanical ventilation or urinary catheter) is one of the most important risk factors for acquiring HCAI. Device-associated infection rates per 1000 device-days detected through the NNIS System in the USA are summarized in Table 3.1.

In surveillance studies conducted in developed countries, HCAI diagnoses rely mostly on microbiological and/or laboratory criteria. In large-scale studies conducted in the USA, the pathogens most frequently detected in HCAI are reported by infection site both hospital-wide and in ICUs.

Furthermore, in high-income countries with modern and sophisticated health-care provision, many factors have been shown to be associated with the risk of acquiring an HCAI. These factors can be related to the infectious agent (e.g., uraemia, capacity to survive in the environment, antimicrobial
Increasing the Knowledge of Hand Hygiene Practices

3.2 Burden of health care-associated infection in developing countries

While HCAI surveillance is already a challenging task in highly resourced settings, it may often appear an unrealistic goal in everyday care in developing countries. In addition to the usual difficulties to define the diagnosis of HCAI, must be added the paucity and unreliability of laboratory data, lack of standardized information from medical records, and scarce access to radiological facilities. Limited data on HCAI from these settings are available from the literature. This is well demonstrated by an electronic search of the period 1998–2008, which allowed the retrieval of around 200 scientific papers published in English and approximately 100 in other languages. Overall, no more than 85 of these papers featured rigorous, high-quality, methodological characteristics.

The magnitude of the problem is particularly relevant in settings where basic infection control measures are virtually nonexistent. This is the result of the combination of numerous unfavorable factors such as understaffing, poor hygiene and sanitation, lack or shortage of basic equipment, and inadequate structures and overcrowding, almost all of which can be attributed to limited human resources. In addition to these specific factors, an unfavorable social background and a population largely affected by malnutrition and other types of infections and/or diseases contribute to increase the risk of HCAI in developing countries. Under these conditions, thousands of infections – in particular due to hospital B and C viruses and human immunodeficiency virus (HIV) transmission – are still acquired from patients, but also from HCWs through unsafe use of needles, medical devices, and contaminated soaps, inadequate surgical procedures, and deficiencies in biomedical waste management.

When referring to endemic HCAI, many studies conducted in developing countries report hospital-wide rates higher than in developed countries. Nevertheless, it is important to note that most of these studies concern single hospitals and therefore may not be representative of the problem across the whole country. For example, in one-day prevalence surveys recently carried out in single hospitals in Albania, Morocco, Tunisia, and the United Republic of Tanzania, HCAI prevalence rates were 19.1%, 17.8%, 17.6%, and 14.8%, respectively. Given the difficulties to comply with the USA Centers for Disease Control and Prevention (CDC) definitions of nosocomial infection, this most frequently surveyed type of infection is SSI, which is the easiest to define according to clinical criteria. The risk for patients to develop SSI in developing countries is significantly higher than in developed countries (e.g., 30.3% in a pediatric hospital in Nigeria, 23% in general surgery in a hospital in the United Republic of Tanzania, and 19% in a maternity unit in Kenya). The burden of HCAI is also much more severe in high-risk populations such as adults housed in ICUs and neonates, with general infection rates, particularly device-associated.
Increasing the Knowledge of the Importance of Hand Hygiene Practice in Rural India

Ashley Whaley, Nursing, Ellise D. Adams, Nursing

**Overview**

When analyzing the needs of rural India, there are significant barriers in the education of the importance of hand hygiene practices in rural India. The intervention implemented was a hand hygiene informational cube to educate on the importance of adequate hand washing and effective mechanisms.

**Explanation**

Nurses play a key role in encouraging behavior change and best hand hygiene practices among clients and within communities.

**Hand Hygiene Cube Use**

- There was evidence that the individuals were motivated to improve their hand hygiene practices.
- I think the individuals saw the need for good hand hygiene in their country, specifically.
- I think the individuals gained knowledge on the importance of hand hygiene practices.
- During the presentation individuals were engaged and asked thoughtful questions.
- As I was presenting the hand hygiene cube, the individuals were attentive and listening.
- I gained knowledge of hand hygiene practices that I did not know before.
- I felt confident in teaching hand hygiene using the hand hygiene cube.
- I was educated well on how to use the hand hygiene cube.

**Impact**

- Handwashing with soap can save over 600,000 lives a year by decreasing the number of diarrheal and respiratory infections (1).
- Diarrheal diseases were the cause of 212,000 child deaths and pneumonia was the cause of 397,000 deaths in India in 2010 (1).
- Handwashing with soap can decrease the number of diarrheal infections by half, acute respiratory infections by 6-44% (1).

**References**


**Acknowledgements**

Thank you to Dr. Ellise Adams, Dr. Ann Bianchi, and Dr. Thuy Lynch for helping me with my research process. Thank you to Beth Wilson and Dave Cook for helping me with funding and preparation for my research project.
Appendix J

IRB Approval Letter

Date: 31 December 2019

PI: Ashley Pursifell

PI Department: College of Nursing

The University of Alabama in Huntsville

Dear Ashley,

The UAH Institutional Review Board of Human Subjects Committee has reviewed your proposal titled: *Increasing the Knowledge of the Importance of Hand Hygiene Practice in Rural India* and found it meets the necessary criteria for approval. Your proposal seems to be in compliance with these institutions Federal Wide Assurance (FWA) 00019998 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46).

Please note that this approval is good for one year from the date on this letter. If data collection continues past this period, you are responsible for processing a renewal application a minimum of 60 days prior to the expiration date.

No changes are to be made to the approved protocol without prior review and approval from the UAH IRB. All changes (e.g. a change in procedure, number of subjects, personnel, study locations, new recruitment materials, study instruments, etc) must be prospectively reviewed and approved by the IRB before they are implemented. You should report any unanticipated problems involving risks to the participants or others to the IRB Chair.

If you have any questions regarding the IRB’s decision, please contact me.
Increasing the Knowledge of Hand Hygiene Practices

Sincerely,

Ann L. Bianchi
IRB Chair
Associate Professor, College of Nursing

Expeditied: form 2

☐ Clinical studies of drugs and medical devices only when condition (a) or (b) is met. (a) Research on drugs for which an investigational new drug application (21 CFR Part 312) is not required. (Note: Research on marketed drugs that significantly increases the risks or decreases the acceptability of the risks associated with the use of the product is not eligible for expedited review. (b) Research on medical devices for which (i) an investigational device exemption application (21 CFR Part 812) is not required; or (ii) the medical device is cleared/approved for marketing and the medical device is being used in accordance with its cleared/approved labeling.

☐ Collection of blood samples by finger stick, heel stick, ear stick, or venipuncture as follows: (a) from healthy, nonpregnant adults who weigh at least 110 pounds. For these subjects, the amounts drawn may not exceed 550 ml in an 8 week period and collection may not occur more frequently than 2 times per week; or (b) from other adults and children, considering the age, weight, and health of the subjects, the collection procedure, the amount of blood to be collected, and the frequency with which it will be collected. For these subjects, the amount drawn may not exceed the lesser of 50 ml or 3 ml per kg in an 8 week period and collection may not occur more frequently than 2 times per week.

☐ Prospective collection of biological specimens for research purposes by noninvasive means. Examples: (a) hair and nail clippings in a nondisfiguring manner; (b) deciduous teeth at time of exfoliation or if routine patient care indicates a need for extraction; (c) permanent teeth if routine patient care indicates a need for extraction; (d) excreta and external secretions (including sweat); (e) uncannulated saliva collected either in an unstimulated fashion or stimulated by chewing gumbase or wax or by applying a dilute citric solution to the tongue; (f) placenta removed at delivery; (g) amniotic fluid obtained at the time of rupture of the membrane prior to or during labor; (h) supra- and subgingival dental plaque and calculus, provided the collection procedure is not more invasive than routine prophylactic scaling of the teeth and the process is accomplished in accordance with accepted prophylactic techniques; (i) mucosal and skin cells collected by buccal
scraping or swab, skin swab, or mouth washings; (j) sputum collected after saline mist nebulization.

Collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications).

Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

Collection of data from voice, video, digital, or image recordings made for research purposes.

Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

**Exempt form 3:**

Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (a) research on regular and special education instructional strategies, or (b) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods. The research is not FDA regulated and does not involve prisoners as participants.

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interviews, or observation of public behavior in which information is obtained in a manner that human subjects cannot be identified directly or through identifiers linked to the subjects and any disclosure of the human subject’s responses outside the research would NOT place the subjects at risk of criminal or civil liability or be damaging to the subject’s financial standing, employability, or reputation. The research is not FDA regulated and does not involve prisoners as participants.

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement) survey procedures, interview procedures, or observation of public behavior if (a) the human subjects are elected or appointed public officials or candidates for public office, or (b) Federal
statute(s) require(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter. The research is not FDA regulated and does not involve prisoners as participants.

Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. The research is not FDA regulated and does not involve prisoners as participants.

Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs;(iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs. The protocol will be conducted pursuant to specific federal statutory authority; has no statutory requirement for IRB review; does not involve significant physical invasions or intrusions upon the privacy interests of the participant; has authorization or concurrent by the funding agency and does not involve prisoners as participants.

Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture. The research does not involve prisoners as participants.

Surveys, interviews, or observation of public behavior involving children cannot be exempt.