

2-1-2010

## Participation in "Handwashing University" Promotes Proper Handwashing Techniques for Youth

Ginger Fenton

*Pennsylvania State University, gdc3@psu.edu*

Rama Radhakrishna

*Pennsylvania State University, brr100@psu.edu*

Catherine Nettles Cutter

*Pennsylvania State University, cnc3@psu.edu*



This work is licensed under a [Creative Commons Attribution-Noncommercial-Share Alike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/).

---

### Recommended Citation

Fenton, G., Radhakrishna, R., & Cutter, C. N. (2010). Participation in "Handwashing University" Promotes Proper Handwashing Techniques for Youth. *The Journal of Extension*, 48(1), Article 15.  
<https://tigerprints.clemson.edu/joe/vol48/iss1/15>

This Research in Brief is brought to you for free and open access by the Conferences at TigerPrints. It has been accepted for inclusion in The Journal of Extension by an authorized editor of TigerPrints. For more information, please contact [kokeefe@clemson.edu](mailto:kokeefe@clemson.edu).



**February 2010**  
**Volume 48 Number 1**  
**Article Number 1RIB7**

[Return to Current Issue](#)

# **Participation in "Handwashing University" Promotes Proper Handwashing Techniques for Youth**

**Ginger Fenton**

Graduate Assistant

Department of Veterinary and Biomedical Sciences

[gdc3@psu.edu](mailto:gdc3@psu.edu)

**Rama Radhakrishna**

Associate Professor

Department of Agricultural and Extension Education

[brr100@psu.edu](mailto:brr100@psu.edu)

**Catherine Nettles Cutter**

Associate Professor

Department of Food Science

[cnc3@psu.edu](mailto:cnc3@psu.edu)

The Pennsylvania State University

University Park, Pennsylvania

---

**Abstract:** A study was conducted to assess the effectiveness of the Handwashing University on teaching youth the benefits of proper handwashing. The Handwashing University is an interactive display with several successive stations through which participants move to learn necessary skills for proper handwashing. Upon completion of the Handwashing University, 87% of youth completing a program assessment survey indicated they felt handwashing was more important. The majority of youth surveyed (66.7%) indicated specific changes they would make in their handwashing behavior. Overall, results indicate participation in the Handwashing University prompts youth and their families to practice proper handwashing techniques.

---

## **Introduction**

Health and hygiene issues among youth are a major concern to parents, adults, school personnel, and youth themselves. One key issue within the health and hygiene context is proper washing of hands. Proper handwashing is vital because of the range of activities—playing, farming, cooking, cleaning—that youth, children, and adults pursue in day-to-day life. According to the Centers for Disease Control (CDC), handwashing is the single most important means of preventing the spread of disease.

A number of studies (Abbot, Byrd-Bredbenner, Wheatley, Cottone, & Clancy, 2008; Comer, Ibrahim, McMillan, Baker, & Patterson, 2009; WHO, 2006; & Pittet, 2001) have been conducted to create awareness

of the importance of proper handwashing in preventing outbreaks of food-borne disease and other illnesses among healthcare professionals, youth, and adults. Consensus from these studies suggests that youth and adults believe that handwashing is very important, but seldom follow recommended handwashing practices.

Extension personnel in many states across the U.S. have developed educational programs to address this critical issue. A "Handwashing University" program was developed by Penn State Cooperative Extension to create awareness and teach proper handwashing practices to youth, children, and adults. This handwashing program is a key component of the Food Safety and Quality initiative of the Cooperative Extension Plans of Work.

A study was conducted in Pennsylvania to assess the effectiveness of Handwashing University. The study targeted youth attending major agricultural events in Pennsylvania while they participated in a Handwashing University interactive display. In this program, participants move from station to station while learning the necessary skills for proper handwashing.

Proper handwashing is a very basic and simple concept and is vital for children to learn because they are a population susceptible to contracting illnesses from improper hygienic practices. Recent outbreaks of illness associated with foods, pleasure cruise ship operations, and day-care centers indicate that improper handwashing, or lack of handwashing, contributes to millions of cases of food borne illnesses and thousands of deaths each year. Gerba, Rose, and Haas (1996) cited young children as being especially susceptible to the risk of contracting an illness from food or water. Roberts (2001) concurs with this assessment, noting that young children are at risk for illness because the human immune system does not reach maturity until puberty.

As a result, children are not fully able to protect themselves against harmful bacteria and viruses. Several illness outbreaks due to *Escherichia coli* O157:H7 and *Campylobacter* spp. sickened and hospitalized children following their attendance at agricultural fairs or petting zoos (CDC 2001; CDC 1999; Crump et al., 2003). Cases of salmonellosis, including cases among children, have been linked to improper hygienic practices in association with the handling of chicks and ducks (CDC, 2000). In 2001, outbreaks of Norwalk-like virus occurred at two summer camps where adequate handwashing facilities were lacking (CDC, 2001). Studies of children have indicated that interventions to teach handwashing techniques, such as instruction on proper techniques and scheduled washing, lead to a reduction in gastrointestinal illnesses and infections (Master, Hess Longe, & Dickson, 1997; Day, St. Arnaud, & Monsma, 1993; Luby et al., 2004).

## Purpose and Objectives

The purpose of the evaluative study reported here was to assess the effectiveness of the Handwashing University on youth. Specifically, the study was aimed at:

1. Creating awareness among youth about the importance of handwashing;
2. Determining whether participants intended to change their current behavior/practices relative to handwashing; and
3. Determining relationships, if any, between select characteristics of participants and perceived use of proper handwashing techniques.

## Methods and Procedures

The Handwashing University display provides a way of encouraging and rewarding youth for their willingness to learn the skills necessary for proper handwashing. The Handwashing University interactive display includes a series of stations. They are as follows.

**Station 1:** The first station allows participants an opportunity to view their hands and fingernails up close using a microscope attached to a television (Scope-on-a-rope; <[www.schooltr.com](http://www.schooltr.com)>). At this station, participants see tiny dirt particles not visible to the naked eye that are projected onto a large screen, thereby providing a visual incentive for proper handwashing.

**Station 2:** At the second station, participants apply a lotion with fluorescent particles to their hands (Glitterbug™; Brevis Corp.) and view the particles on their hands under a black light. The fluorescent particles simulate the presence of germs and dirt on participants' hands.

**Station 3:** The next stop is the handwashing station stocked with warm water, soap, paper towels, and a waste receptacle. Participants are encouraged to wash their hands with soap and water to remove the fluorescent particles. Volunteers and posters offer step-by-step instructions while urging participants to wash vigorously with soap and warm water for 20 seconds.

**Station 4:** The fourth station allows participants to view their hands under another black light and to rate the effectiveness of the handwashing procedures. Volunteers point out areas where improvement is needed. Participants are encouraged to re-wash their hands, if necessary.

**Station 5:** Upon completion of the stations, participants receive a bright orange "Handwashing University Graduate" sticker, a personalized diploma, and a bar of soap. Over the past 3 years, the Handwashing University program has been presented at several agricultural events in the Northeast, including Ag Progress Days (2003, 2004, and 2005) and the Pennsylvania Farm Show (2004).

A short, simple, and easy-to-respond-to postcard was developed to assess the effectiveness of the interactive handwashing activity. Questions on the postcard addressed the importance of handwashing, current practices used, likelihood of changing handwashing practices as a result of participating in the Handwashing University, and demographic questions. While the survey was developed to be used at various agricultural events, the researchers were aware of the possibility that youth from both rural and urban settings may have been in attendance; therefore, that demographic question was included.

Adults were encouraged to accompany the child during the handwashing activity, which prompted the researchers to inquire as to whether the presence of an adult may influence the child's likelihood to change their behavior. Additional questions focused on the intent to change specific, selected behaviors that were emphasized at each of the stations of the Handwashing University. The survey was generated to gather feedback on the usefulness and merit of the Handwashing University and could be used by extension professionals as a brief evaluation tool when conducting such activities.

The questions were validated by a panel of experts consisting of faculty from Food Science and Agricultural and Extension Education departments at The Pennsylvania State University. Surveys were distributed over a 3-day period at various times by two of the researchers who alternately were posted just after the final station of the Handwashing University. Participants were randomly approached and asked to complete the survey. Upon completion of Handwashing University, participants were asked to complete the postcard evaluation and place it in a drop box located near the display. Descriptive and non-parametric techniques were used to analyze the data. The research protocol used for the study was approved by the Institutional Review Board of

Penn State University.

## Findings

Results indicate that participation in the Handwashing University display prompted youth to practice proper handwashing techniques. Eighty-seven percent (87%) of youth surveyed at the display indicated they felt handwashing was more important after participating in the activity. The majority of youth surveyed (66.7%) indicated specific changes they would make in their handwashing behavior such as scrubbing for at least 20 seconds or more (60%), use of warm water (44.5%), scrubbing nails and between fingers (51%), and use of soap (54%). Overall, findings suggest that participation in the Handwashing University prompts youth and their families to take appropriate action to practice proper handwashing techniques.

**Table 1.**  
Changes Youth Would Make in Their Handwashing Behavior

Intended Behavior Change:	Percentage Responding (n)
Use warm water	44.5% (35)
Scrub for at least 20 seconds	60% (47)
Scrub nails and between fingers	51% (40)
Use soap	54% (42)

The study revealed the existence of significant relationships among some characteristics and variables, including place of residence, age, and presence of an adult (usually parents) with youth and handwashing practices.

- Youth in rural areas (81%) are more likely than urban youth (76%) to change the way they washed their hands.
- Youth ages 8-18 are more likely (73%) to change the way they washed their hands than those youth who are under 8 years (50%).
- The presence of an adult during the handwashing activity is independent of behavior change.
- Regardless of being an adult or youth, participants indicated that they would adapt or enforce proper handwashing techniques.

## Discussions, Implications, and Conclusions

Overall, findings from the study reported here suggest that youth view proper handwashing techniques as a very important aspect of staying healthy. Although the study has shed some light on youth awareness and behaviors relative to proper handwashing, much remains to be done.

Findings of the study suggest that Extension can play an active and collaborative role to create awareness of proper handwashing among youth, children, and adults. From the programmatic context, Extension educators should collaborate with schools and health agencies at the county level to create awareness of this issue. They can work together to develop educational materials, conduct programs, share resources, and assess the impact of their efforts. Considering the foodborne illnesses and diseases associated with poor handwashing and subsequent health costs, the need for collaborative efforts in addressing this issue is imperative. Some possible strategies for Extension involvement include the following action items.

Extension educators should use health education classes as an avenue to create awareness in schools. The potential exists for Extension educators to work with community groups, youth groups, churches, and clubs to create awareness of the importance of handwashing. Furthermore, educational efforts similar to the Handwashing University program can be targeted to food processing industries and other groups that handle food and other products.

Suggestions for further research include:

1. Targeting the right age group of youth for an in-depth study to assess the effectiveness of Handwashing University;
2. Executing a more detailed questionnaire addressing youths' current handwashing practices and awareness of foodborne illnesses and other diseases;
3. Examining interactions between parents and adults to assess the role they play in formation of lasting proper handwashing habits; and
4. Conducting additional studies using follow-up measures to document behavior changes as a result of these types of activities.

Finally, we recommend that programs on handwashing and other health and hygiene issues be targeted to youth because habits formed at younger ages continue to have lasting impacts as young people become adults.

## References

Abbot, J. M., Byrd-Bredbenner, C., Wheatley, V., Cottone, E., & Clancy, M. (2008). Observed hand washing behaviors of young adults during food preparation. *Food Protection Trends*, 28(11), 912-916.

Centers for Disease Control. (2001). Norwalk-like virus outbreaks at two summer camps -Wisconsin, June 2001. *Morbidity and Mortality Weekly Report* 50(30):642-643.

Centers for Disease Control. (2001). Outbreaks of *Escherichia coli* O157:H7 infections among children associated with farm visits—Pennsylvania and Washington, 2000. *Morbidity and Mortality Weekly Report* 50(15):293-297.

Centers for Disease Control. (2000). Salmonellosis associated with chicks and ducklings—Michigan and Missouri, Spring 1999. *Morbidity and Mortality Weekly Report* 49(14):297-299.

Centers for Disease Control. (1999). Outbreak of *Escherichia coli* O157:H7 and *Campylobacter* among attendees of the Washington County Fair—New York, 1999. *Morbidity and Mortality Weekly Report* 48(36):803-804.

Comer, M. M., Ibrahim, M., McMillan, J. V., Baker, G. G., & Patterson, S.G. (2009). Reducing the spread of infectious disease through hand washing. *Journal of Extension* [On-line], 47(1) Article1RIB7. Available at: <http://www.joe.org/joe/2009february/rb7.php>

Crump, J. A., Braden, C. R., Dey, M. E., Hoekstra, R. M., Rickelman-Apisa, J. M., Baldwin, D. A., De Fijter, S. J., Nowicki, S.F., Koch, E. M., Bannerman, T. L., Smith, F. W., Sarisky, J. P., Hochberg, N., & Mead, P. S. (2003). Outbreaks of *Escherichia coli* O157 infections at multiple county agricultural fairs: a hazard of mixing cattle, concession stands and children. *Epidemiology and Infection*, 131:1055-1062.

Day, R. A., St. Arnaud, S., & Monsma, M. (1993). Effectiveness of a handwashing program. *Clinical Nursing Research*, 2(1):24-40.

Gerba, C. P, Rose, J. B., & Haas, C.N. (1996). Sensitive populations: who is at greatest risk? *International Journal of Food Microbiology*, 30:113-123.

Luby, S. P., Agboatwalla, M., Painter, J., Altaf, A., Billhimer, W. L., & Hoekstra, R. M. (2004). Effect of intensive handwashing promotion on childhood diarrhea in high-risk communities in Pakistan: a randomized controlled trial. *Journal of the American Medical Association*, 291(21):2547-2554.

Master, D., Hess Longe, S. H., & Dickson, H. (1997). Scheduled hand washing in an elementary school population. *Family Medicine*, 29(5):336-339.

Pittet, D. (2001). Compliance with hand disinfection and its impact on hospital-acquired infections. *Journal of Hospital Infection*, 48(Suppl. A), S40-S46.

Roberts, C. A. (2001). *The food safety information handbook*. Oryx Press: Westport, CT. pps. 21-22.

WHO. (2006). *Guidelines on hand hygiene in health care improving adherence to hand hygiene practice: A multidisciplinary approach*. WHO Press.

---

Copyright © by *Extension Journal, Inc.* ISSN 1077-5315. Articles appearing in the Journal become the property of the Journal. Single copies of articles may be reproduced in electronic or print form for use in educational or training activities. Inclusion of articles in other publications, electronic sources, or systematic large-scale distribution may be done only with prior electronic or written permission of the Journal Editorial Office, [joe-ed@joe.org](mailto:joe-ed@joe.org).

If you have difficulties viewing or printing this page, please contact JOE Technical Support.