

Keep Calm and Wash Your Hands!

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INTRODUCTION

- According to the CDC up to 80% of diseases/transmission can be prevented (CDC, 2016).
- Handwashing education can reduce the number of people with diarrhea-related illness by 31% and respiratory illness by 16-21%, as well as the incidence of antibiotic resistance (CDC, 2015).
- Attendance is a key factor in academic success. Effective hand hygiene has important implications for college campuses. White et al. (2003), found after installing hand sanitizer dispensers in certain dorms, there was a statistically significant reduction in URI (from 14.8% to 39.9%) with 43% less missed school days.
- A gender bias has been demonstrated in previous research studies (e.g. Judah et al. 2009; Borchgrevink et al. 2013).
- Even with the knowledge of the importance of handwashing, researchers have found only 31% of men and 65% of women washed their hands after using a public restroom (Judah et al., 2009).
- Chen et al. (2007) suggest that every one dollar spent on handwashing education could result in a \$ 23.70 benefit.
- Pittet, Sax, Hugonnet & Harbarth (2004) reported the cost of hand hygiene promotion is less than 1% of the costs associated with nosocomial infections.
- The purpose of this study was to educate campus members about the importance of effective hand hygiene and to promote handwashing efforts on campus.

METHOD

Participants

- Survey and handwashing challenge was open to all community college campus members.
- Participants randomly recruited.
- Incentive to enter a raffle to win one of the three Fitbits was provided.
- Total of 156 campus members participated (45% male, 54% female, and 1% other).
- The majority (77%) of students were from the 16-24 year age group; 14% in the 25-39 year age group; and 9% in the 40-69 age group.
- The majority (94%) of participants identified their role as a student, while 6% identified as a faculty or staff member.
- 34% of participants were from Health Sciences Division, followed by 33% from Liberal Arts, 23% from Business & Public Services, 7% Science, Technology, Engineering & Mathematics (STEM), and 1% Undeclared.

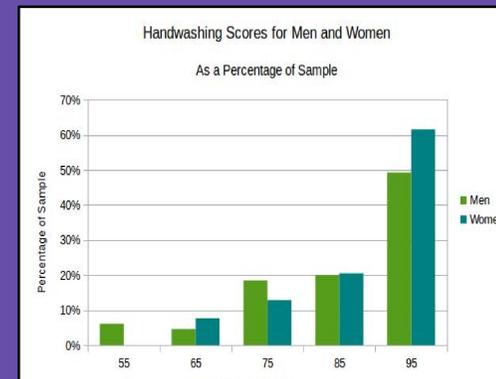
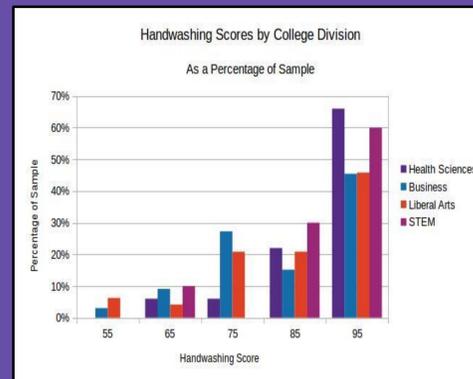
Survey

- Participants completed a short survey assessing hand hygiene knowledge:
 - How long is the acceptable amount of time to wash hands using soap and water?
 - How long should hands be rubbed together after applying hand sanitizer?
 - What percentage of alcohol should a hand sanitizer have to be effective?
- Using a Likert scale, participants rated their observations of self and others' hand-washing practices.
 - I wash my hands after using the restroom.
 - I see people on campus leave the restroom without washing their hands.
 - I carry hand sanitizer or wipes.

Handwashing Challenge

- Participants applied "Glo Germ," a lotion which simulates pathogens and fluoresces under a blacklight, prior to washing their hands.
- Hands were observed under the blacklight prior to and after hand hygiene was performed.
- Participants were instructed to wash their hands as they normally would.
- A grading system was developed to measure the percentage of handwashing effectiveness.
 - Fingers=6 points each; Backs of palms=10 points each; Front of palms=10 points each.
- Participants were informed of their handwashing score and educated about effective handwashing practices. They were also provided with hand sanitizer.

GRAPHS



RESULTS

- Only 18% correctly answered the appropriate length of time to wash hands. More males (20%) vs. females (17%) answered correctly.
- 87% of participants incorrectly answered the appropriate amount of alcohol that should be in hand sanitizer in order to be effective. More females (29%) vs. males (25%) answered correctly.
- The majority (70%) of participants correctly answered the length of time hands should be rubbed together when using hand sanitizer. More females (53%) vs. males (43%) answered correctly.
- 83% of participants reported "Strongly Agree" for using both soap and water after using the restroom.
- The majority (60%) reported "Strongly agree" or "Agree," while 36% reported "Strongly Disagree" or "Disagree" about whether they carry hand sanitizer. More females (38%) than males (9%) reported carrying hand sanitizer.
- 23% of participants reported they "Strongly Agree" that hand sanitizer is available on campus.
- 43% of participants reported they cough into their hands, but only 19% stated they wash their hands after they cough.
- The average score for grading effectiveness of participants' handwashing was 88% (20-100% range); 100% mode; and 94% median.
- While the same mode (100%) was found between genders for effectiveness of handwashing, differences were found for mean score, range, and median.
- Females in this study reported more consistent hand washing after use of a restroom, the use of soap and water, washing their hands prior to eating, and after they cough as compared to males.
- Compared to males, females in this study report higher observations of seeing others leave a restroom without washing their hands (27% vs. 20%), but also that they see more people wash their hands after use of the restroom (26% vs. 9%).

Handwashing Effectiveness Scores by Gender

Gender	Mean	Range	Median
Males	86%	20-100%	90%
Females	90%	62-100%	94%

Gender	I wash my hands after using the restroom.	I use both soap and water after using the restroom.	I see people wash their hands after using the restroom.	I see people leave the restroom without washing their hands.	I carry hand sanitizer.	I wash my hands prior to eating.	I wash my hands after I cough.
Males	78%	78%	9%	20%	9%	32%	16%
Females	86%	87%	26%	27%	38%	41%	23%

CONCLUSIONS

- The majority of participants were not aware of the correct length of time hands should be washed for effective hand hygiene. These findings are in line with those of Borchgrevink, Cha & Kim (2013) who found only 5% of their sample washed hands the recommended length of time.
- The majority of participants were not aware of the amount of alcohol needed for hand sanitizer to be effective, indicating further education for consumers of hand sanitizer is needed.
- However, they were aware of the length of time needed to rub hands together after applying hand sanitizer. As proper hand hygiene requires a set length of time in order to be effective (CDC, 2016), these results suggest simpler methods of teaching duration may be beneficial.
- Most participants reported they fail to witness others washing hands prior to leaving the restrooms. These findings are in line with those of Borchgrevink, Cha, & Kim (2013) who reported 10.3% of subjects did not wash their hands at all prior to leaving a restroom.
- Interestingly, 25% reported they were undecided about whether they saw others leave the restroom without washing their hands. Findings may suggest that participants are not actively observing others perform hand washing. Results from Judah et al. (2009) suggest that handwashing compliance increased when restrooms were busier due to the possible social effect in sending subliminal messages about handwashing compliance.
- The high numbers of participants (83%) who reported they wash their hands may be unreliable due to the nature of self-reporting. However, the use of direct observation in this study by assessing handwashing effectiveness through the use of Glo Germ lends strength to our findings.
- 38% of females versus only 9% of males report to carry hand sanitizer, suggesting that perhaps males fail to carry hand sanitizer due to lack of a place to carry it on their person. The implications suggest that if hand sanitizer packages were more compact or easy to carry for males that they may do so on a more frequent basis.
- An important limitation of this study is that participants may have performed more effective hand hygiene than usual due to being observed. In addition, the incentive of winning a Fitbit may have influenced those who do not frequently wash their hands to participate in the study.

FUTURE DIRECTIONS...

- Increased hand hygiene education efforts on campus, such as using messages via media sources (e.g. Facebook page, electronic signs, campus newsletter).
- Implement more signage about the importance of handwashing in restrooms and other popular areas around campus (i.e. Cafeteria, gyms, and library).
- Explore the possibility of increased availability of hand sanitizer on campus.
- Results of this study and that of previous research studies indicate the need for using varied messages between the genders to promote handwashing compliance.
- Results of this and other studies suggest that starting hand hygiene education at an earlier age might be beneficial to learning about the importance of and length of time required for hand hygiene to be effective. Educating people using a simple message such as the "Happy birthday" song, as promoted by the CDC may be beneficial towards these efforts.
- The cost of preventing an infection is a small fraction of the cost of treating one. Studies show that establishment of effective hand hygiene practices would result in decreased health care spending as well as reduced absenteeism in college students.

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