Should Prince George’s Community College Invest in Hand Sanitizer in the Open Computer Labs?

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## Table of Content

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>3</td>
</tr>
<tr>
<td>Field Study</td>
<td>7</td>
</tr>
<tr>
<td>Survey</td>
<td>10</td>
</tr>
<tr>
<td>Observational Study</td>
<td>15</td>
</tr>
<tr>
<td>Conclusion</td>
<td>17</td>
</tr>
<tr>
<td>References</td>
<td>18</td>
</tr>
<tr>
<td>Appendix</td>
<td>20</td>
</tr>
</tbody>
</table>
Background

Hand sanitizer is an antiseptic that sanitizes without water. It helps in preventing bacterial transfer and greatly reduces hospital acquired infections (Boyce & Pittet, 2002). Most hand sanitizers contain 60% ethyl alcohol which upon evaporation leaves skin conditioning emollients such as natural moisturizers derived from plant materials. Hand sanitizer is widely used by the healthcare industry as an added measure against the spread of disease (Boyce & Pittet, 2002). They are used without water but they are not cleaning agents so they don’t actually remove dirt from the surface.

Prince George’s Community College (PGCC) may want to use hand sanitizer to combat the spread of bacteria and reduce infection among students. PGCC has previously installed hand sanitizers in the Bladen Hall open computer lab which is open to all registered students. However, they have been removed due to lack of use. The STEM Collegian Center students have undertaken research to find out if the implementation of hand sanitizer in the PGCC open computer labs would be advantageous to reduce the spread of pathogens and also to determine if usage can be increased.

Community-based epidemiologic studies have shown that hand sanitizer has beneficial effects. Hand sanitizer has been found to be effective in reducing gastrointestinal illnesses in households and in curbing absentee rates in elementary schools (Hammond, Ali, Pendler, Dolan, 2002). To reduce infections in health care settings, alcohol-based sanitizer is recommended as a component of hand hygiene (FDA, 1994). The FDA recommends that alcohol-based hand sanitizer have a concentration of 60 - 95 percent ethanol or isopropanol which is the concentration range of greatest germicidal efficacy (FDA, 1994).
Hand sanitizer may not stop the spread of the cold virus and any company that makes hand sanitizer and claims that they help to prevent the common cold are giving out false advertisement (FDA, 1994). An example of this is the article seen in the New York Times that Proctor and Gamble was ordered to stop advertising that hand sanitizer prevents the spread of viruses that cause colds (FDA, 1994). The FDA states that there is insufficient evidence to show that this product is safe and effective for such use.

Hand sanitizer is used by the military. Investigations were done to test the impact of a customized alcohol-based hand sanitizer hand-hygiene regiment in an Army basic training setting. The entire population at the U.S. Army Field Artillery Training Center at Fort Sill, Oklahoma, participated in a 13-week prospective cohort study in 2005 (Peter J Mott, Brian W Sisk, James W Arbogast, Cristina Ferrazzano-Yauss, et al, Military Medicine, 2007). Two training battalions were randomly assigned to a control group, one to the primary intervention group (customized Purell Instant Hand Sanitizer regimen, education, reinforcement) and one to the secondary intervention group (customized Purell Instant Hand Sanitizer regimen only). When compared to the control group, intervention groups experienced 40% less respiratory illness (p < 0.001), 48% less gastrointestinal illness (p < 0.02), 44% less lost training time (p < 0.001), and 31% fewer health care encounters (p < 0.001) (Peter J Mott, Brian W Sisk, James W Arbogast, Cristina Ferrazzano-Yauss, et al. Military Medicine, 2007). These findings suggest that this intervention is capable of significantly reducing illness in this setting and has the potential to help reduce absenteeism in the military workforce as a whole.

Pediatricians investigated the effectiveness of a multifactor intervention, including alcohol-based hand-sanitizer and surface disinfection, in reducing absenteeism caused by
gastrointestinal and respiratory illnesses in elementary school students. A study was performed at elementary schools. Intervention classrooms received alcohol-based hand sanitizer to use at school and ammonium wipes to disinfect classroom surfaces daily for 8 weeks. Control classrooms followed usual hand-washing and cleaning practices. Absences were recorded along with the reason. Swabs of environmental surfaces were evaluated by bacterial culture and polymerase chain reaction for norovirus (a group of related, single-stranded RNA, nonenveloped viruses that cause acute gastroenteritis in humans), respiratory syncytial virus, influenza, and parainfluenza which are three common respiratory viruses. The primary outcomes were rates of absenteeism caused by gastrointestinal or respiratory illness. Days absent were modeled as correlated Poisson variables and compared between groups by using generalized estimating equations. Analyses were adjusted for family size, race, health status, and home sanitizer use. A total of 285 students were randomly assigned and baseline demographics were similar in the 2 groups. The adjusted absenteeism rate for gastrointestinal illness was significantly lower in the intervention-group subjects compared with control subjects. The adjusted absenteeism rate for respiratory illness was not significantly different between groups. Norovirus was the only virus detected and was found less frequently on surfaces in intervention classrooms compared with control classrooms (9% vs 29%).

Studies have been linked to cases of alcohol abuse by prison inmates and hospitalized patients. One such case is with an older gentleman admitted to the hospital who on the third day of hospitalization admitted to ingesting the contents of a 500-mL pump bottle of ethanol-based hand sanitizer that was attached to the wall of his hospital room. Based on his weight [80 kg] and his blood ethanol level, the patient consumed approximately 450
ml or 2 cups of the product (Thanarajasingam, Gita. Diedrich, Daniel A. Mueller, Paul S. Oct 2007). He remarked, "It had a horrible taste, but I was drunk pretty quick."
Field Study

A Field Study was conducted to ascertain the advice and knowledge of various PGCC administrators, faculty, and staff on the feasibility of using hand sanitizer in the open computer labs. The Director of Technology Support Services, the Operation Manager of Facilities Management, and an Associate Professor of Nursing were and the following is a summary.

Ms. Debra Rodriguez, Director of Technology Support Services, along with some of her staff which includes Carrie Hackshaw, Brenda Jones, and Lois William, were interviewed on 12 June 2008 at 12:30 pm at their Bladen Hall office. Ms. Rodriguez stated that approximately 20% of students using the computer lab do ask for hand sanitizer if they know that it is available. She also said that the lab staff tries to make sanitizer available at the entrance of the computer labs for student to use before and after they use the computer. However, Ms. Rodriguez said that the effort was unsuccessful because the other 80% of students do not use the hand sanitizer. This left them with no option but to only provide sanitizer for students that specifically ask for it. Ms. Hackshaw said that they will try to use hand sanitizer again in all open computer labs so that students can protect themselves from keyboard bacteria that will make them to be sick. Ms Rodriguez also mentioned a study that was conducted that found more bacteria on a computer keyboard than a typical toilet seat. The study that Ms. Rodriguez is referring was conducted by Dr. Charles Gerba, a microbiologist from the University of Arizona (Laura Hightower and Terrie Rooney, 1999). He tested twelve different surfaces common to most work spaces (Study finds High Levels of Bacteria in Personal Office Space, 2002). Computer keyboards were found to have more bacteria than any surfaced
tested in a bathroom. Dr. Gerba reported that using disinfecting wipes on surfaces can reduce illness-causing bacteria by 99.9%. Though this study demonstrated that bacteria are quite abundant in office work spaces, it does not prove that office workers were becoming sicker due to the high bacterial count on their keyboards. This study was promoted by the Clorox Corporation which has a direct financial benefit since they produce hand sanitizer and disinfecting wipes.

Mr. Walter Shorter, the Operation Manager of Facilities Management, was interviewed by telephone on 4 August 2008 at 9:30 am and he reported that his staff initiated the use of hand sanitizer in the Bladen Hall computer lab. A dispenser was installed on the wall adjacent to entry. Mr. Shorter said that students simply did not use it and the dispenser was removed. He said that they have hand sanitizer in storage but cannot force students to use it. He is looking towards the research from this study to help determine whether or not hand sanitizer should be reinstalled in open computer labs. He suggested that instead of putting a dispenser in the computer labs, he would prefer that a disinfectant be used periodically to clean the keyboards thus reducing the risk of student exposure to bacteria. Mr. Ken Kiv, an Instructional Assistant of the Student Technology Center at Montgomery College, was interviewed by telephone on 13 August 2008. He reported that they are using alcoholic swaps to clean their keyboards. Mr. Kiv said that they use the alcoholic swaps at the start, middle and end of every semester. He also reported that hand sanitizer and hand swipes are provided for student use as a backup to the thrice semester disinfection of keyboards. Inquires at the University of Maryland on 14 August 2008 at 2 pm put us in touch with Jocelyn Blain, Graduate Assistant in the Nethics Program. Ms. Blain reported that there is currently no policy or funding for hand
sanitizer or computer keyboard cleaning. However, she noted that the computer lab staff thought it was a good idea.

Ms. Barbra Engh, Associate Professor of Nursing, was interviewed on 5 August 2008 at 9:00 am in her Lanham Hall office. She said that in the decision to use hand sanitizer one should weigh the cost to benefit ratio. She said that the cost and effort it would take to distribute hand sanitizer has to be weighed against the actual benefit to students such that bacteria infection is significantly reduced and students experience fewer infection rates. Professor Engh said that PGCC should perform a study that tests computer keyboards for bacteria and whether using hand sanitizer significantly reduces the risk of infection among students. Professor Engh reported that she prefers the use of water and soap because the friction that is created helps to get rid many more bacteria than hand sanitizer.
Survey

A survey was conducted to determine student opinion about the availability and use of hand sanitizer in PGCC open computer labs. Dr. Tamela Hawley, PGCC Dean of Planning and Institutional Research, was consulted about developing a survey to test whether students used hand sanitizer and if they wanted hand sanitizer available at PGCC (Dr. Tamela Hawley 6/18/08, Kent Hall). A six question survey was composed (Appendix A). This survey process involved 44 randomly selected students.

Students were randomly selected to fill-out a survey at PGCC’s Largo campus in an open computer lab (7/3/08 and 7/14/08, Bladen Hall open computer lab). Due to privacy reasons, no demographical data was collected. Forty-four students agreed to complete the survey. The survey took an average of two minutes to complete. Participants were thanked for their participation.

Results

**Question 1.** Do you use hand sanitizer?

\[ n = 44 \]

Yes = 82% = 36 participants

No = 18% = 8 participants

**Question 2.** If you answered “No,” please select a reason below as to why you do not use it.

\[ n = 8 \]

a. don’t know what it is used for = 12.5%

b. don’t remember to use it = 0%

c. don’t like to use it = 50%
d. don’t think it is useful = 37.5%

e. I have an adverse reaction to it = 0%

f. Other = 0%

**Question 3.** If you answered “Yes,” how often do you use it?

n = 36

a. more than once per day = 52.7%

b. at least once per day = 22.2%

c. at least once per week = 13.9%

d. less than once per week = 11.1%
Question 4. Do you believe hand sanitizer should be available on PGCC’s campus?

n = 44

Yes = 90.9% = 40 participants

No = 9.1% = 4 participants

Question 5. Where do you believe hand sanitizer would be most useful?

n = 44

a. computer labs = 47.7%

b. bathrooms = 59.1%

c. cafeteria = 45.5%

d. classrooms/labs = 8.6%

e. offices = 9.1%

*Some participants selected more than one.
**Question 6.** Do you have any comments?

n = 7

- Please do provide use with hand sanitizer, especially during the winter.
- Use them more.
- I love the STEM Collegian Center.
- Provide good and nice smelling moisturizing soap because hand sanitizer has a drying effect.
- I think it’s good but it really cannot kill all bacteria or microorganisms on one’s hand. It can only be used for controlling these organisms.
- The classrooms are either too cold or too hot.
- I did an experiment on this in 12th grade and hand sanitizer worked best.

**Discussion**

Hand sanitizer is used as a supplement or alternative to hand washing with soap and water when a sink with soap and clean, running water is not available. According to the results, most participants (82%) reported using hand sanitizer. This demonstrates that
most students believed that it is useful. Of the participants that reported using it, most use it at least once per day (75%). This shows that many PGCC students are concerned about preventing the spread of bacteria and infection. A small percentage of participants reported not using hand sanitizer (12%). Of those who did not use it, most didn’t like it or didn’t think it was useful. There is a small subset of people that will probably not want to use hand sanitizer despite a policy that promotes it. A greater percentage of participants would like PGCC to provide hand sanitizer (90.9%). This showed that even those who don’t use it would like to have it available. Nearly 50% of participants would like hand sanitizer available in the cafeteria, bathrooms, or computer labs. Less than 10% of participants wanted it available in classrooms, labs or offices. Very few participants wrote comments but those that did were favorable toward using hand sanitizer.

A drawback of this study was the relatively low sample size (n=44). The results may have varied more with a greater number of responses. Another condition that may have played a factor in the reporting was the location. All those surveyed were at PGCC’s Bladen Hall open computer lab. Those using the computer labs may be overly concerned about the spread of bacteria thus overestimating the desire by students to have hand sanitizer available.
Observational Study

In order to answer the question if the college should invest in hand sanitizer in open computer labs, an observational study was conducted to determine if students that had access to hand sanitizer would use it. Previous experience with the hand sanitizer was largely unsuccessful. However, the type of and way that the hand sanitizer was displayed may have been the cause of its poor usage. Therefore, an alternative type of hand sanitizer was selected to test the hypothesis that a more convenient version and adequate display would increase usage among students in the open computer labs.

Walter Shorter, the Operation Manager of Facilities Management, recommended S. Freeman & Sons, Inc., a paper, maintenance, and restaurant supply company that PGCC contracts with for supplies to obtain hand sanitizer. Ten boxes of individually wrapped Purell Sanitizing Hand Wipes were purchased with a cost of $42.00 (total of 1000 individually wrapped wipes).

Debra Rodriguez, the Director of Technology Support Services, was consulted about permission to display and offer hand sanitizer to students in the Bladen Hall open computer lab. Half of the supply of hand sanitizer (500 wipes) were displayed in a clear container and placed in the printer area where students access computer generated printing. A sign advertising the free hand sanitizer was displayed above the container. Students were encouraged to take one wipe. The hand sanitizer was available to students beginning in the morning of Tuesday, August 26, 2008.

Hand sanitizer was supposed to be counted at the end of each day to determine how much students used. At the end of day one, all wipes were taken. Several days later, the second half of the wipes (500) were placed in the same area. Again, at the end of day, all
wipes were taken. The computer lab staff reported that some students took more than one wipe and this may account for the high usage rate. Andrew Gunrag, a lab technician at the Bladen Hall open computer lab, said that in the morning, usage was higher as compared to afternoon and evening (Andrew Gunrag 9/11/08, Bladen Hall). He reported that his supervisor, who didn’t know that the wipes were part of a study, asked him to refill the container. Mr Gunrag also said that trash from the wipes was not a problem and the majority of students properly disposed of trash associated with the wipes.
Conclusion

The survey clearly shows that PGCC students would like hand sanitizer available. The observational study showed that the type and display of hand sanitizer made a significant difference in student usage. The convenient, individually wrapped hand wipes were easy to use and perhaps, re-use.

We support student desire that hand sanitizer be available in all PGCC open computer labs. We recommend that the individually wrapped Purell Sanitizing Hand Wipes be used because they are easy to display, restock, and are portable. The wipe appears to be more desirable among students than the liquid gel. Because students don’t police themselves, the hand sanitizer wipes should be placed in an area where lab staff can loosely monitor use. This would cut down on the cost to the college. We also recommend that the maintenance staff wipe down the computer keyboards and work stations at least three times per semester similar to the Montgomery College plan.

The availability of hand sanitizer would increase student confidence in PGCC’s concern for student welfare. Though there is no way to eliminate all risk of bacterial infection, we feel that any efforts to reduce the possibility would be of benefit to students. Our research is only supporting the use of hand sanitizer in the open computer labs. Since soap and water is available in bathrooms, hand sanitizer would be redundant. Since there is no student to student transmission of bacteria in the cafeteria, we feel it is the student’s personal responsibility to ensure that they are not self-infecting themselves when eating. However, based on the results of our survey, we feel PGCC should provide hand sanitizer as a courtesy to students in all open computer labs.
References

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Should PGCC Provide Hand Sanitizer?

The STEM (Science, Technology, Engineering, and Math) Collegian Center is conducting a survey to ascertain your views on hand sanitizer. As you may be aware, hand sanitizer is used on many college campuses in an attempt to prevent the spread of germs. This data will be used to help the administration determine if hand sanitizer would be useful on PGCC’s campus. Please answer the questions below and return.

1. Do you use hand sanitizer?
   a. Yes
   b. No

2. If you answered “No,” please select a reason below as to why you do not use it.
   a. Don’t know what it is used for
   b. Don’t remember to use it
   c. Don’t like to use it
   d. Don’t think it is useful
   e. I have an adverse reaction to it
   f. Other

3. If you answered “Yes,” how often do you use it?
   a. More than once per day
   b. At least once per day
   c. At least once per week
   d. Less than once per week

4. Do you believe hand sanitizer should be available on PGCC’s campus?
   a. Yes
   b. No

5. Where do you believe hand sanitizer would be most useful?
   a. Computer labs
   b. Bathrooms
   c. Cafeteria
   d. Classrooms/Labs
   e. Offices

6. Do you have any comments you wish to make?

THANK YOU!