

The Cleanliness of Beautyblenders

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Abstract

Background

Keeping makeup tools in sanitary conditions is necessary in order to prevent the risk of pathogenic microbes from multiplying in unhygienic conditions which may pose a risk to health (Bashir & Lambert, 2019). Beautyblenders are a highly regarded product by consumers worldwide (Shah, 2016). The company launched their sponges in 2007 and in 2016, they have sold more than 6.5 million sponges globally (Bashir & Lambert, 2019). It is a reusable pink cosmetic sponge that can be used with a number of different cosmetic products such as foundations, beauty creams, and concealers for application on the face. This study is about examining the public who uses Beautyblenders and their knowledge in regards to cleaning the reusable sponges.

Methods

The survey was created using Survey Monkey and distributed as an online self-administered survey through Facebook and Reddit. The survey consisted of questions that focused on demographics, knowledge of Beautyblender hygiene, general opinions from the public and opinions from professional makeup artists. Chi-square statistical tests were used to analyze the data.

Results

Of the total 317 responses, 303 were recorded and used from SurveyMonkey. of the 303 respondents, when asked their age, 263 respondents were 35 years old and under (86.80%). 40 respondents were 36 years old and over (13.2%). Regarding their level of education, 241 respondents had an above high school level of education (79.54%) and 62 respondents had a high school level of education or less (20.46%). This study found that there was no association between age and Beautyblender cleanliness ($p= 0.211$) and there was no association between education level and Beautyblender cleanliness($p= 0.974$).

Conclusion

This study identified that none of the dependent variables had a significant association between age or level of education and the cleanliness of BeautyBlenders. The results suggest that while most people are fairly clean and maintain their BeautyBlenders, there are still people who may benefit from and or need to be educated on hand hygiene, effective sanitation methods, and also why reusable sponges are difficult to properly disinfect.

Keywords: makeup, skincare, Beautyblender, cleanliness, beauty, Canada

Introduction

There are studies and news articles that highlight the dangers of using old or expired make-up (*Expert Cautions against Using Fake, Expired Makeup Products*, 2021; Giacomel et al., 2013; Tejal P et al., n.d.), warning of eye infections such as conjunctivitis, acne, and skin infections (Giacomel et al., 2013; Tejal P et al., n.d.). This brings to attention that consumers may also lack general awareness of hygiene in regards to make-up applicators such as the Beautyblender due to the reluctance in discarding products, especially if they feel the product is costly (Tejal P et al., n.d.). This may further encourage the sponge itself to harbour pathogenic microorganisms, leading to disease or illness when used by the consumer (Cohut, 2019). Made out of a foam material that is very water-absorbent, it allows the sponge to absorb and hold more water than typical disposable sponges (Beautyblender, 2019), an

advantage that consumers value because of the decrease in product absorption and smoother application (Jacques, 2016). With more individuals on the internet, YouTube, and social media, reusable cosmetic sponges are becoming more commonplace for regular people to use (Moten, 2020). The Beautyblender is very popular (Voytko, 2021), seventeen are sold every minute, which expresses the idea that these luxurious sponges can be used repeatedly before they must be thrown away.

Literature Review **Cleaning and Disinfection**

Beautyblender encourages consumers to wash their sponges after each use. “Within one minute of washing, Blendercleansers provide protection against 99.7% of harmful germs for up to 24 hours (Beautyblender, 2019).” Blendercleansers is a liquid solution that claims it is a highly effective yet gentle formula that is effective for everyday use. They instruct consumers

to dry their sponges in a clean well-ventilated area as well as to replace their sponges every three months (Beautyblender, 2019). Lastly, Beautyblender suggest consumers dispose of their sponge every thirty to ninety days. However, in areas of high humidity such as in British Columbia, where the weather is moderately humid throughout the year (Environment and Climate Change Canada, 2021), this may impede the drying processing, encouraging mould growth and bacteria. This may prompt consumers to attempt unproven methods to remove the microorganisms instead of discarding it, jeopardizing the skin, leading to skin irritation or infection.

Regulations and Guidelines

In the United States, most states prohibit the use of sponges on multiple clients. An example is the state of Virginia, a person must dispose of sponges after use on a client (Virginia Administrative Code, 2003). “Single-use items designed by the

manufacturer for use on no more than one client should be discarded immediately after use on each individual client, including powder puffs, lip color, cheek color, sponges, styptic pencils, or nail care implements. The disinfection and reuse of these items is not permitted and the use of single-use items on more than one client is prohibited” (Virginia Administrative Code, 2003). However, Beautyblenders and other innovative sponges were marketed and designed to be reused over a longer period of time before disposal which could encourage operators from keeping them and reusing them with multiple clients.

In British Columbia’s Guidelines for Personal Service Establishments, cosmetic sponges may be classified as a noncritical instrument that would need intermediate-level disinfection (ILD), potentially inadvertently encouraging the reuse of sponges. “Noncritical instruments are any tools intended to contact intact skin, but may

accidentally contact nonintact skin or receive blood or body fluid splatter” (Ministry of Health Health Protection Branch, 2017). ILDs are able to destroy vegetative bacteria such as mycobacteria, fungi, and viruses that could potentially be found in sponges if they are not disinfected regularly. However, Beautyblender discourages this because, “cleaning your makeup sponges with any alcohol formulas, face wash, or by boiling or exposing to extreme heat” may destroy its absorbent property (Beautyblender, 2019). This discrepancy may lead to infections between consumers and clients of operators who choose not to follow BC’s PSE guidelines and discard the used sponges. An implicit responsibility is that the public may look to professionals who use Beautyblenders as a model for good hygiene practices. While cosmetic sponges are considered noncritical instruments in PSE settings and present a low risk of transmitting highly contagious

pathogens, good hygiene practices are important in order to prevent health hazards like infections from occurring at a personal level as well.

Lack of Consumer Knowledge

Based on Reddit and other social media platforms, there are several different methods individuals may use to clean and or disinfect their cosmetic sponges (*Best Methods to Clean Your Beauty Blender?*, 2017; *How Do You Clean a Beauty Blender?*, 2018; *How to Completely Clean and Sanitize Beauty Blender?*, 2017; Chadwick, 2019). For example, designated makeup sponge washing machines (Nieves & Delgado, 2021) bar soap and water, Beautyblender’s liquid soap, antibacterial dish soap, or a combination of several methods (*Best Methods to Clean Your Beauty Blender?*, 2017; *How Do You Clean a Beauty Blender?*, 2018; *How to Completely Clean and Sanitize Beauty Blender?*, 2017). Another method that was

brought up often was to disinfect sponges by utilizing the heat from microwaves (Chadwick, 2019). This method requires the sponge to be completely damp, the addition of liquid soap, and a cup of water (Chadwick, 2019). The sponge is then to be microwaved for sixty seconds in order to sanitize and kill any bacteria that may be on the sponge (Chadwick, 2019). However, a study that evaluated the required time to disinfect kitchen sponges contaminated with E. Coli using a commercial microwave, determined that E. coli was found to be present in three samples microwaved at one minute (Bassan et al., 2014). This suggests that a longer period of time may be required to destroy or inactivate E. coli, such as the ones detected in the Beautyblender samples from A. Bashir and P. Lambert's study (Bassan et al., 2014). Throughout social media, there are many open forum discussions such as on Reddit, about whether one method is better than another

for cleaning and disinfecting reusable sponges (Reddit, 2021). This lack of consensus on the methods to properly wash and disinfect reusable sponges seems to indicate that consumers have been left with no alternative besides trial and error. Whether the mentioned methods have been proven to be effective at reducing mould growth, bacteria and other pathogenic microorganisms to a safe level are uncertain. This perplexing issue regarding reusable cosmetic sponge hygiene concerning both general consumers and cosmetic professionals aligns with the Public Health Agency of Canada's report on infection prevention in personal service settings in 2019 (Popalayar et al., 2019). It describes the inconsistency in methods for cleaning and disinfection, the limited and poor-quality Canadian literature and research that is available, the limited knowledge of burden due to illnesses associated with personal services settings, and the difficulties in

enforcing standards and guidelines because personal services are now not only offered in commercial retail spaces, but also at a mobile, home-based, mall kiosk, and special events (Popalyar et al., 2019). Most literature indicates single-use sponges in PSEs should not be reused whether it is on the same individual or not, even if it were to be sanitized (Bashir & Lambert, 2019; Beautyblender, 2019; Chadwick, 2019; Chiu, 2021; Cohut, 2019; Giacomel et al., 2013; Lee, 2016; Oliveri, 2020; *Sanitation and Disinfection: Can You Clean and Sanitize Your Beauty Sponges for Reuse on Multiple Clients?*, 2018). One concern with the reuse of makeup sponges, similarly to kitchen sponges, is that they may not properly dry all the way through between uses which would allow bacteria to multiply in damp moist conditions (Nichols, 2014). However, this does not address the safety of reusable sponges. Beautyblenders and other reusable sponges have been on the rise in

recent years, as a result of both an increased popularity among beauty and skincare ambassadors on social media (Moten, 2020) as well as a growing interest in environmental sustainability. More studies may be done on the reliability of disinfecting reusable cosmetic sponges that are intended to be kept for longer.

Presently, it seems the most effective way for an individual to prevent bacterial and fungal growth on their Beautyblender sponges is to properly wash and disinfect them after each use, allowing them to completely air dry in an open space, and discard it after a maximum of three months. Perhaps additional education on good hygiene as well as promoting awareness of the risks associated with using reusable sponges may help prevent diseases or infection at the individual level. This may also trigger general consumers visiting PSEs that may have reusable sponges to discourage operators from working with

reusable sponges once they understand the risks it could potentially have on their health.

Previous Research Studies

Of the articles found related to cosmetics and sponges, only one looked closely at the Beautyblender specifically as a risk to consumers partly due to poor hygiene. A study by A. Bashir and P. Lambert (2019) conducted in the United Kingdom examined lipstick, lip-gloss, eyeliners, mascara, and beauty benders (Bashir & Lambert, 2019). *Staphylococcus epidermidis* is one of the most common bacteria found on the epidermis of the face, making up more than ninety percent of resident aerobic microbes (Charles Patrick Davis, 1996). *Micrococci species* such as *Micrococcus luteus* are not as commonly found, but make up twenty to eighty percent of the micrococci found on the skin (Charles Patrick Davis, 1996). They are generally harmless, however, they can become

opportunistic pathogens for the immunocompromised which can lead to infections such as bacteremia (Public Health Agency of Canada, 2011). Lastly, *Diphtheroids* such as *Propionibacterium acnes* and *P. granulosum*, which have been found to cause acne, can also be typically seen (Charles Patrick Davis, 1996). Of the products that were examined, seventy-nine to ninety percent of all used products were contaminated by bacteria (Bashir & Lambert, 2019). While most bacteria found are harmless such as the ones that live symbiotically on human skin, the study found the presence of *Staphylococcus aureus*, *Escherichia coli*, and *Citrobacter freundii* (Bashir & Lambert, 2019). These bacteria are correspondingly associated with skin infections, foodborne illnesses, and urinary tract infections, pathogenic bacteria that should not be found (Cohut, 2019). It was revealed that ninety-three percent of the seventy-nine sampled Beautyblenders had

not been cleaned regularly and sixty-four percent of users had dropped their sponge on the ground and continued to use it (Bashir & Lambert, 2019). Bashir notes that “Consumers’ poor hygiene practices when it comes to using makeup, especially beauty blenders, is very worrying when you consider that we found bacteria such as E. coli — which is linked with fecal contamination — breeding on the products we tested”(Cohut, 2019) While this is a very small sample size, it clearly outlines the need to further educate the public on good hand hygiene and the purpose of regular maintenance in order to prevent infections from occurring.

Purpose of the Study

The purpose of this research project is to determine how well Beautyblenders are cleaned by the general public who enjoys using make-up, analyzing habits, the process of sanitization, and what consumers do in the interim to maintain cleanliness to

prevent contamination before disposal of their sponges. It aims to determine how well they are cleaned by the general public based on age and level of education.

Methods and Materials

Materials

The materials that were needed to conduct this survey study required the use of a laptop with access to the internet, SurveyMonkey (<http://surveymonkey.com>), NCSS 2021 Statistical Package and Microsoft Office Excel. Facebook and Reddit were used to distribute surveys (Reddit, 2021).

Methods

Public data was collected using a self-administered 18-question online survey that was designed on SurveyMonkey. The survey was then distributed through the social media platforms Facebook and Reddit. A link to the survey was posted in a wide variety of Canadian or makeup-related Facebook groups and subreddits to target the

Canadian makeup user population. Initially, the survey was to be posted on Reddit only. However, it was found that the activity level of the subreddits was minimal and unexpected difficulties in being able to post on certain subreddits made it very difficult to recruit respondents. Therefore, Facebook was added as a secondary platform to recruit more responses. Due to the high level of activity on Facebook groups, there was an increased focus on promoting the survey on Facebook.

Data collection began when surveys were published on the social media platforms on January 18, 2022, and ended on February 7, 2022. Overall, 317 responses were gathered at the end of the collection period.

Inclusion

To participate in the study, persons were to own and use a Beautyblender sponge and be a current resident of Canada (living in Canada for at least 12 continuous months). Lastly, respondents who did not

answer any questions pertaining to hygiene or meet the initial survey requirements were excluded from the data pool.

Ethics

To ensure the ethics of this research study the methods, cover letter, consent form and survey questions were sent to and approved by, the BCIT Research Ethics Board before the survey was distributed to the public.

Results

Description of Data

Non-numeric nominal and ordinal data were collected. The survey was comprised of questions that focused on demographics, knowledge of Beautyblender hygiene, general opinions from the public and opinions from professional makeup artists. Of the total 317 responses, 303 were recorded and used. 14 responses were removed and were not included in the analysis because of a lack of survey completeness. They did not answer any hygiene-related questions, nor included their

answers that asked of their opinions about the use of Beautyblenders. Therefore, it was determined to not include their responses because they only answered the demographic portion of the survey and did not include enough useful information for inferential analysis.

Cleanliness was measured by giving a score to the answers that were made options on the survey. For example, one of the questions on the survey asked how often the respondent's Beautyblender was cleaned. The options included "daily", "after every use", "once a week", "once a month", "once every few months", "never", "I don't know" or "prefer not to answer". A corresponding score number was given depending on how often it was cleaned. The more often the Beautyblender was cleaned, the higher the score. The score for each question used to calculate cleanliness ranged from 3 being the highest and 0 being the lowest level of cleanliness. In this instance, "daily" and

"after every use" resulted in a score of 3. "Once a week" and "once a week" was a score of 2. "Once every few months" and "never" was a score of 1. Lastly, those who answered "I don't know" or "prefer not to answer" scored a 0. The scores for each question that was applicable were then summed. A total score between 49 to 34 was considered "high", 33 to 18 was considered "medium", and 17 to 0 was considered "low" cleanliness. A total of 11 questions were used from the survey to calculate the total cleanliness score which was then converted into a rank.

Descriptive Statistics

Out of the 303 respondents, when asked their age, 263 respondents were 35 years old and under (86.80%). 40 respondents were 36 years old and over (13.2%) (Figure 1).

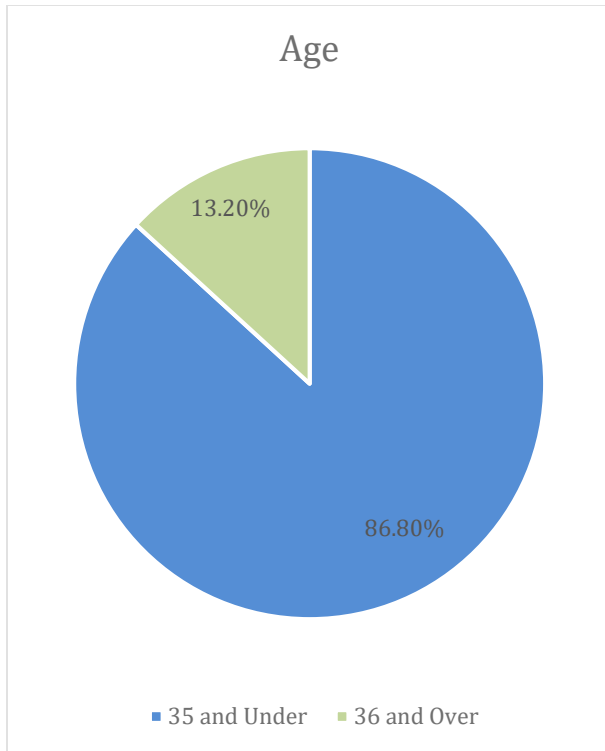


Figure 1. Age of Participants

Regarding their level of education, 241 respondents had an above high school level of education (79.54%) and 62 respondents had a high school level of education or less (20.46%) (Figure 2).

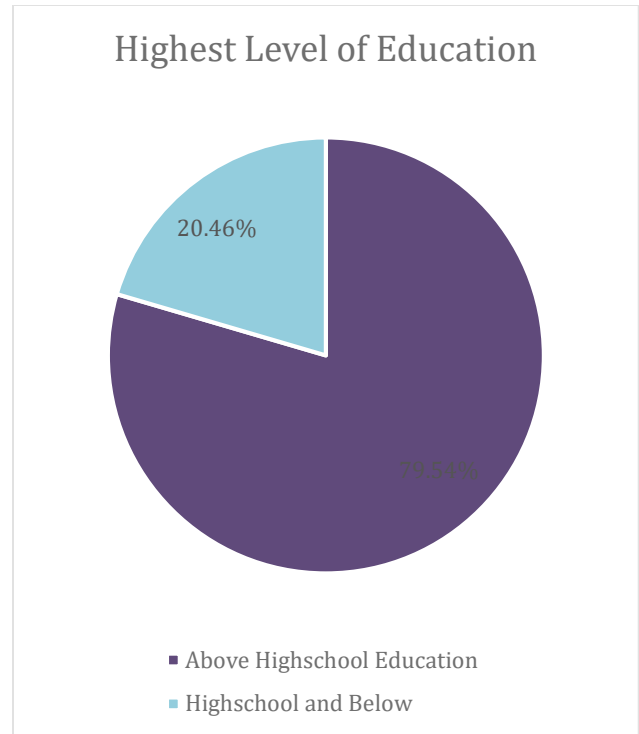


Figure 2. Highest Level of Education of Participants

Inferential Statistics

NCSS is a software program designed for PC computers (NCSS, 2021) that is used to produce inferential statistical results to analyze the non-numerical and non-parametric data between independent variables such as age and education level and the dependent variable of Beautyblender cleanliness. Table 2 shows a summary of the two inferential statistical tests that were conducted using NCSS 2021.

Chi-square tests were performed using NCSS 2021 (NCSS,2021) in order to compare the frequencies between the dependent and independent variables as seen in Table 1 (Heacock, H., personal communication [Chi-Squar, χ^2 , Test], 2021).

Table 1: The Null and Alternative Hypotheses

H₀ and H_A	Results	Conclusion
H ₀ : There is no association between age and Beautyblender cleanliness H _A : There is an association between age and Beautyblender cleanliness	P= 0.21106539	Cannot reject H ₀ and conclude that there is a statistically significant association between gender age and Beautyblender cleanliness
H ₀ : There is no association between education level and Beautyblender cleanliness H _A : There is an association between education level and Beautyblender cleanliness	P= 0.97418243	Cannot reject H ₀ and conclude that there is a statistically significant association between education and Beautyblender cleanliness

Discussion

The main objective of this study was to determine if there were any dependent variables that were associated with the level of Beautyblender cleanliness. The provided data indicated that none of the dependent variables had a significant association between age or level of education and the cleanliness of Beautyblenders. The study did not show that those aged 35 and under nor 36 and over had an influence on cleanliness. Level of education whether it be above high school level or high school and below did not have an affect on cleanliness. Neither dependent variables reinforced the results that were found in A. Bashir and P. Lambert's study in the UK (2019).

Still, these results may be interpreted as a positive outcome because it suggests that there are no demographics or variables that are more likely to be cleaner than the other in Canada.

An explanation for the results may be because most people have a generally

good idea of how to properly clean and sanitize their products, especially because of the COVID-19 pandemic. According to a survey study that was conducted by Harrison Wipes in the United Kingdom, it was found that people are now more aware of cleanliness due to the coronavirus pandemic (News Desk, 2021). Perhaps the public is now more aware of the importance of maintaining a hygienic routine for items that are used daily by cleaning and sanitizing items after each use and what is considered proper hand hygiene.

Of the multiple choices that respondents were able to pick to the question that asks how they clean their sponges, using vinegar was an option. An interesting result through the inclusion of this choice was to see that some respondents chose vinegar as one of their methods of sanitization. Alternative methods such as the use of vinegar is ineffective against *S. aureus* (CDC, 2008), which was one of the

bacteria there were found in Beautyblenders in the study conducted by A. Bashir and P. Lambert (2019) in the United Kingdom. While vinegar has some abilities to work as a disinfectant and cleaner, it is not as effective as bleach or other approved methods of sanitization (Costello, 2021).

The results also suggest that while most people are fairly clean, there are still people who may need to be educated on proper hand hygiene, effective sanitation methods, and also why reusable sponges are difficult to properly disinfect.

Limitations

The results could not be extrapolated to all residents of Canada regarding age and level of education because the distribution of each demographic was not evenly distributed.

There were limitations regarding the methodology and conducting of the online survey. Surveys were only posted on Reddit and Facebook. This was a potentially

significant limiting factor on sample size because not all demographics of Beautyblender users are users of Reddit or Facebook. Many subreddits had strict rules regarding the posting of external links, the frequency of posts, and the nature of the posts themselves (Reddit, 2021). Therefore, Facebook was also added in order to increase the sample size because it was found that there were many Facebook groups that were less stringent on posts regarding surveys compared to Reddit. Another challenge was the severe lack of respondents that identified as “male” or “other” in the survey. This made it difficult to analyze the data to find whether there was an association between gender and Beautyblender cleanliness. Because the sample size for the different groups of genders was not adequate, it was not used in the analysis.

In-person surveying would have helped to increase the response rate.

However, this method of surveying was not chosen in order to minimize public encounters and to adhere to the recommended COVID-19 control measures. Posting invitations along with QR codes in public places such as on BCIT bulletin boards, including a prize draw and keeping the survey open for a longer period of time may have also helped to increase the sample size, therefore increasing both external and internal validity. It may have also generated more responses from different ages groups than the ones that were seen in the survey. In-person surveying at varying locations of makeup supply stores that sell Beautyblenders, may have also helped capture users who are not found readily online on Facebook or Reddit in order to gather a broader age range in order to identify associations between different ages and Beautyblender cleanliness. However, a theory as to why there was no associations found may be because of the limited sample

sizes of each dependent variable. Smaller break downs of age groups and education levels were combined into broader ranges in order to make up for the lack of responses of each group to have a significant sample size. This may be also due to the use of using Facebook and Reddit as the methods of collecting survey data. According to Statista, 12.8 percent of Canadians aged between 18 and 34 years old, 3.9% of 35 to 54-year-olds, and 0.2% of 55 years old and above have a Reddit account as of October of 2017 (Statista Research Department, 2021). As for Facebook, the majority of Canadian users were found to be in the 25-to-34-year age range, with 26.1 percent belonging to this demographic. 19.8 percent of users were between 35 to 44 years old, and 2.4 percent of users were between 13 to 17 years old (Statista Research Department, 2022). The user statistics from Statistic were similar to the majority of the respondent age groups that participated in this research study. Most

respondents were aged 35 and under (86.80%) which falls in between both the statistics for Facebook and Reddit users in Canada.

Knowledge Translation

The results from this study can be used to publish brochures or other publications that perform research that may be an educational tool for the public. Tools for the public would be to help them understand and recognize what are some of the proper methods of sanitization. For example, explaining why using vinegar is not a proper method of sanitization or disinfection whereas a bleach water solution at the proper concentration would be a proper sanitizer. It would also be beneficial to provide the rationale behind it due to the misconception that some have that vinegar is an effective disinfectant (Costello, 2021). It would be beneficial for the public to comprehend the differences between a cleaner, sanitizer, and a disinfectant and the limitations of each category. Another

example would be understanding the inherent risks of visiting a personal services establishment (PSE) that uses Beautyblenders on more than one client is not hygienic because there are no methods to disinfect a sponge adequately. Therefore, it is to their benefit to not patron PSEs that reuse their makeup sponges regardless if they are made to be reusable or single-use. This gives the public the ability and awareness to visit a sanitary PSE.

Future Research

Future research may include:

- Survey the difference in the length of use between Beautyblender and other brands of reusable sponges before they are replaced by consumers
- Survey public versus professional makeup artists and their differences in sanitation and or disinfection methods
- Testing the public's knowledge of sanitation and disinfection methods of reusable sponges
- Test disinfection and sanitation methods and which work the best on reusable sponges without affecting

the absorbent properties of the sponge

Conclusion

While the study concluded without finding any significant associations in this study, the survey results provided evidence that educating the public on proper sanitation methods is still needed. A large majority of the respondents appear to understand that it is important to have good hand hygiene and also good sanitation procedures for make-up tools such as Beautyblender sponges.

However, the challenge is to convey to the public the rationale behind having better hygiene in order to prevent the transmission of diseases and also educate them to make an educated choice in the chance that they visit a PSE that reuses Beautyblenders on clients. Results from this study may be used by EHOs to better understand what the public does to keep themselves safe, how it can be improved, and also what could potentially be happening at PSEs that use

reusable sponges.

Acknowledgements

The lead author would like to thank Dale Chen, Kevin Freer, and Helen Heacock for their continued support and enthusiasm throughout the course of this study, as well as everyone who participated.

Competing Interest

The author declares that they have no competing interests.

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