

# THE DIFFERENCE NUMBER OF GERMS BETWEEN HAND WASHING USING LIQUID SOAP AND HAND SANITIZER

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## THE DIFFERENCE NUMBER OF GERMS BETWEEN HAND WASHING USING LIQUID SOAP AND HAND SANITIZER

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### Abstract

High activity causes the hands to be contaminated by bacteria so hands can be an intermediary for the entry of bacteria into the body. One of the most common ways to keep your hands clean is to wash your hands. The purpose of this study was to compare the number of bacteria between washing hands with soap and hand sanitizer. This research was a descriptive study with a post test only control group design. The samples were 40 palms of students of DIII Medical Laboratory Technology Department of Health Poltekkes Bengkulu Ministry of Health, 20 students washing their hands using hand sanitizer and 20 others using liquid soap. The results of the study found the ratio of bacterial numbers in the group that washed hands using liquid soap was  $4.1 \times 10^{-5}$  and  $0.3 \times 10^{-5}$  colonies per mL. The number of bacteria in the group that washes their hands using liquid soap is more than in the group that washes their hands using hand sanitizer. Suggestions were given to students to preserve the habit of washing hands before and after activities using liquid soap or hand sanitizer.

**Key words:** *Hand washing, antiseptic, hand sanitizer, germ numbers, liquid soap*

### INTRODUCTION

Daily activities, make hands often contaminated with microbes, so hands can be an intermediary for the entry of microbes into the body. One of the simplest and most common ways to keep your hands clean is to wash your hands with soap. Hand washing is the most important basic technique in infection prevention and control (Potter & Perry, 2012).

The importance of cultivating handwashing properly and correctly is supported by WHO data (2018) and Diarrhea data from the Ministry of Health (2009) which shows that every year an average of 100,000 children in Indonesia die from diarrhea (Cordita, 2017).

The Medical Laboratory Technology Study Program is one of the study programs in the Health Analyst Department of the Bengkulu Ministry of Health Poltekkes which has 98 final year students who are conducting research in the TLM laboratory. Along with the increasing activity of final year students conducting research in the TLM laboratory, it is possible that there are bacteria that can infect due to negligence in washing hands after conducting research in the TLM laboratory. Examination of the bacterial count is suitable as an illustration to prevent infection after conducting research in the TLM laboratory.

The problem of washing hands is often considered a less important problem, so many ignore it, even though hand washing behavior can prevent various diseases such as diarrhea, respiratory infections, bird flu and intestinal worms (Rachmawati & Triyana, 2018). According to Luby et al (2012), the danger caused by unclean hands is the entry of bacteria into one's own body such as through the eyes, nose or mouth and other people through direct touch. Hand washing is proven to be effective in killing bacteria stuck to the hands. The results of the research conducted, have a positive attitude in applying the right and good way of washing hands (Kartika, Rahmawati, & Rousdy 2017).

## **METHOD**

### **Research Design and Subject**

This study is a descriptive study with a pretest–posttest design with a descriptive control group. This study aims to compare the description of the bacterial count on the palms of students from the TLM study program majoring in health analysis at the Health Polytechnic of the Ministry of Health, Bengkulu, after washing their hands with liquid antiseptic soap and with hand sanitizer. The sample in this study was 40 students of the TLM study program majoring in health analysis at the Bengkulu Ministry of Health Poltekkes, 20 students washing with liquid soap, and 20 students washing with hand sanitizer.

### **Instruments and Data Analysis Procedures**

After washing hands using antiseptic liquid soap and hand sanitizer on the number of germs, 20 students were taken hand swabs using 0.9% NaCL, after washing their hands using hand sanitizer and 20 people with antiseptic liquid soap. The analysis of the data used in this study was macroscopic examination observed 2X24 hours after planting the bacteria and observed the growth of bacteria on Plate Count Agar (PCA) media, after that the calculation of

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bacterial numbers was carried out using the Colony Counter, and described based on the percentage (%).

#### **FINDING**

After completing descriptive data processing and obtained the following results.

**Table 1 Germs Numbers after washing hands with liquid soap**

Type of material	Number of sample	Upper limit of germs	Bottom number of germ	Total
Liquiz Soap	20	65%	35%	100%

Table 1 showed the calculation of the number of germs that crossed the limit were 13 samples (65%), 7 samples were below the normal limit (35%), from 20 samples that used liquid soap.

**Table 2 Germs Numbers after washing hands with hand sanitizer**

Type of material	Number of sample	Upper limit of germs	Bottom number of germ	Total
Hand sanitizer	20	30%	70%	100%

<sup>17</sup> Based on Table 2, the results of the count of germ numbers were obtained, the number of germ numbers that crossed the limit, namely 6 samples (30%), 14 samples below the normal limit (70%).

#### **DISCUSSION**

The description of the number of bacteria in the group that washed their hands used more liquid soap than the group that washed their hands with hand sanitizer. This is because in the first group of final year students, there were still health analysts who did not understand the importance of hand hygiene.

The average number of bacteria is more than that is  $4.17 \times 10^{-5}$  colonies per mL, the value of the number of germs that exceeds the limit is 65%, the number of samples that exceeds the limit value is a drawback in the study. This is because it is necessary to control the number of germs in water, because washing hands using water while water also contains bacteria. When compared with the second group, the number of bacteria after washing hands using hand sanitizer is less, namely  $0.3 \times 10^{-5}$  colonies per mL. The large number of germ numbers that exceed the limit, which is 30%, the presence of samples that exceed the limit value makes this study a drawback because of the need to control germ numbers in the environment where the inspection is carried out. The reason is that there is a factor in the exposure of bacteria that are around us to the planted media.

The research that supports this research is the comparison of the number of bacteria numbers between washing hands using soap and hand sanitizers for students majoring in health analysts at the Health Polytechnic of the Ministry of Health Kendari Karya (Apita, 2017). The conclusion of the research shows that hand washing treatment by adding an anti-bacterial or disinfectant agent has a significant effect on the number of germs. In the hand washing treatment, the number of germs was still high, while in the hand washing treatment with antiseptic. Treatment of hand washing with running water the results were not significant. It can be concluded that the hand washing treatment with running water was not effective, while the hand washing and hand sanitizer treatment group was effective in reducing the number of germs. This can be seen from the average number of germ numbers in the three treatments which were lower than the control group. The treatment of hand washing with liquid soap and hand sanitizer is statistically equally effective, but descriptively the treatment of hand washing with hand sanitizer is more effective because it has the lowest average number of germs (Apita, 2017).

Another similar study is the dilution of hand washing liquid soap on the total plate number of palm bacteria. Good hand washing is washing hands using antiseptic soap that contains anti-microbials, rubbing both hands covering the entire surface of the hands and washing them with running water and drying them thoroughly using disposable towels. There is an effect of diluting hand washing liquid soap on the total plate number of palm bacteria. The increase in the amount of dilution is directly proportional to the increase in the number of bacteria that grow and inversely proportional to the ability of hand washing liquid soap to inhibit bacterial growth. Reference and regular

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5 cleaning of hand surfaces can remove dirt and food particles where germs can grow (Ningsih, Wiyadna, & Kusuma, 2019).

3 Antiseptics are chemicals that prevent the multiplication of organisms on the surface of the body by killing these microorganisms or inhibiting their growth and metabolic activity. Antiseptics need to be distinguished from antibiotics that kill microorganisms in living organisms, and disinfectants that kill microorganisms on inanimate objects. However, antiseptics are often referred to as skin disinfectants. Almost all chemicals used as antiseptics can also act as disinfectants. This is determined by the concentration of the material. Alcohol works best at a concentration of 60-80%. Higher alcohol concentrations reduce their ability to denature proteins because protein denaturation requires water. Choosing a hand sanitizer as an alternative to washing hands, it is necessary to consider its composition so that its use is truly effective in reducing the number of germs on hands.

#### **CONCLUSIONS AND SUGGESTIONS**

Based on the finding and discussion, it is concluded the number of bacteria in the group that washes their hands using liquid soap is more than in the group that washes their hands using hand sanitizer. Suggestions were given to students to preserve the habit of washing hands before and after activities using liquid soap or hand sanitizer.

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