



RELATIONSHIP BETWEEN PERSONAL HYGIENE AND *ESCHERICHIA COLI* BACTERIA ON THE PALM OF CHILDREN'S SDN X IN KEDIRI CITY

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Abstract

Introduction: Hands become an intermediary for germs entering the body. For this reason, hand hygiene must always be maintained to minimize the risk of germs entering our bodies, because hands often carry microorganisms from one person to another. The behavior of maintaining cleanliness, especially the palms of the hands, is an effort to empower students in the school environment to know and be able to practice how to maintain personal hygiene, especially the hands. If children do not practice proper personal hygiene, they will be at risk of experiencing various health problems. The aim of this research is to determine the relationship between personal hygiene and the presence of *Echerichia coli* bacteria on the palms of Children at SDN X In Kediri City. **Method:** The design used was cross sectional study. The population was 56. Sampling used Quota Sampling, namely 30 palm swabs from Children at SDN X In Kediri City. In giving scores for Personal Hygiene, a Likert scale was used. Materials used for research were EMB, TSIA, UREA and IMVC media, tools used were coot swabs, incubator, oven and autoclav, personal hygiene variables and *Echerichia coli* bacteria, research carried out from April to May 2023 Chi-square test analysis using SPSS (*Statistical Program For Social Science*). **The results:** 29 samples identified the presence of bacteria and 1 sterile sample, identified bacteria including *Salmonella* sp (30%) also found *Klebsiella* sp (20%) and *Echerichia coli* (47%) bacteria. The personal hygiene of the children showed 50% has bad personal hygiene, 43% has good personal hygiene and 7% has very good personal hygiene. As well as showing the presence of *Echerichia coli* bacteria on the palms of elementary school children. **Conclusion** A significant relationship was found in the statistical test because the results showed an Asymp.Sig value of 0.000 where the value <0.05 where H_a was accepted and H_0 was rejected.

Keywords: Personal hygiene, infection, *Echerichia coli*

INTRODUCTION

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Personal hygiene is a way of caring for personal hygiene to maintain health. Someone who is sick, usually because of hygiene problems that are not paid enough attention. (Pooter and Perry, 2012). The aim of personal hygiene is to improve a person's level of health and maintain a person's personal hygiene (Tarwoto and Wartono, 2014). Children who maintain hand hygiene by regularly washing their hands with soap will avoid microorganisms. They spend most of their time at school, on average a child can spend up to 6 to 8 hours at school. Thus, the environment in schools and school buildings can expose bacteria and viruses that can affect children's health. (Anggraini *et al.*, 2017).

The low awareness and lack of knowledge about health in children means that they still need supervision and guidance from the closest people or influential people to carry out their personal hygiene. If children do not do personal hygiene properly, they will be at risk of experiencing various health problems. Children's immune systems that are not strong enough can make children more vulnerable to bacterial attacks and infections from outside the body (Puspita *et al.*, 2017).

Hands are one part of the body that plays a role in transferring infectious disease-causing agents (Pratama *et al.*, 2013). Dirty or contaminated hands can transfer pathogenic bacteria originating from the body's feces or other sources to food, prevention and control of transmission of infectious diseases can be done by washing hands. Based on research (Luby *et al.*, 2009), shows that consistent hand washing can reduce the risk. It is spread by aerobic, anaerobic and fecal-oral routes. (Wantiyah *et al.*, 2015; Widodo *et al.*, 2017).

Escherichia coli bacteria are Gram-negative bacteria in the form of short rods that are about 2 μm long, 0.7 μm in diameter, 0.4-0.7 μm wide and are facultative anaerobes. *E. coli* forms round, convex, and smooth colonies with well-defined edges (Jawetz *et al.*, 2009). *E. coli* is a member of the normal intestinal flora. *E. coli* plays an important role in the synthesis of vitamin K, the conversion of bile pigments, bile acids and the absorption of nutrients. *E. coli* belongs to the heterotrophic bacteria that obtain food in the form of organic substances from their environment because they cannot prepare the organic substances they need themselves. Organic substances are obtained from the remains of other organisms. These bacteria decompose organic substances in food into inorganic substances,

namely CO₂, H₂O, energy, and minerals. In the environment, these putrefactive bacteria function as decomposers and provide nutrients for plants. *E. coli* becomes a pathogen if the number of these bacteria in the digestive tract increases or is outside the intestine. *E. coli* produces an enterotoxin that causes some cases of diarrhea. *E. coli* associates with enteropathogens to produce enterotoxins in epithelial cells (Jawetz *et al.*, 2016). Clinical manifestations of infection by *E. coli* depend on the site of infection and are indistinguishable from symptoms of infections caused by other bacteria. *et al.*, 2016). *E. coli* bacteria can be everywhere, especially in tropical climates. *Escherichia coli* bacteria. Can contaminate food and can reproduce quickly due to hot and humid environmental conditions. In a weakened state of immune system, *E. coli* bacteria can easily enter through various routes, one of which is through poor hygiene or food contaminated with *E. coli* bacteria. (Majid, 2021)

This research aims to determine the relationship between personal hygiene and the presence of *Echerichia coli* bacteria on the palms Of Children at SDN X In Kediri City

METHOD

The research method used is cross sectional study . The population in this study was 56 Of Children at SDN X In Kediri City, grades 5 and 6. The samples in this study were palm swabs from Of Children at SDN X In Kediri City. The sampling technique used in this research is Quota Sampling. Data analysis In giving scores for personal hygiene, a Likert scale is used which is one way to determine scores in percentage terms. How to take palm swab samples from elementary school children 1) The right palm is swabbed using a sterile cotton swab that has been soaked in nutrient broth, in the direction of the cotton roll. 2) Swab the palm and between the fingers. 3) As a result of sampling, the swab is placed in a test tube containing Nutrient broth. 4) The test tube is closed using cotton wool and aluminum foil. 5) The samples were incubated at a temperature of 37°C for 24 hours (Anggraini, 2017) and to determine the relationship between *E. coli* bacterial contamination in the palm swabs Of Children at SDN X In Kediri City, namely using the Chi-square test using SPSS (*Statistical Program For Social Science*).

RESULT AND DISCUSSION

Based on the research on the Relationship between Personal Hygiene and the Presence of *Echerichia coli* Bacteria on the Palms Of Children at SDN X In Kediri City which has been carried out at the Bacteriology Laboratory of the Institut Ilmu Kesehatan Bhakti Wiyata Kediri as follows:

1. General Data

a. Characteristics of Respondents Based on Gender

Based on the research that has been done, it is known that th characteristics of respondents based on gender are as follows:

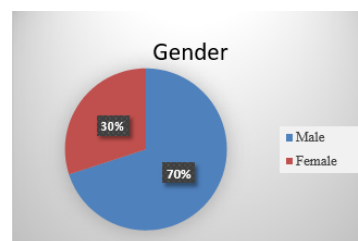


Figure 1. Percentage of Respondents by Gender

Based on the picture above, it can be seen that the gender of the respondents was 70% male (21 children) and 30% female (9 children).

b. Characteristics of Respondents Based on Age

Based on the research that has been done, it is known that the characteristics of respondents based on age are as follows:

Table 1. Characteristics of Respondents by Age

No.	Age	Frequency	Percentage (%)
1.	11 years	15	50
2.	12 years	15	50
Total		30	100

2. Custom Data

a. Results of Identification of *Echerichia coli* Bacteria on Palms and Questionnaires Of Children at SDN X In Kediri City



Figure 2. Hand Swab Sampling Process

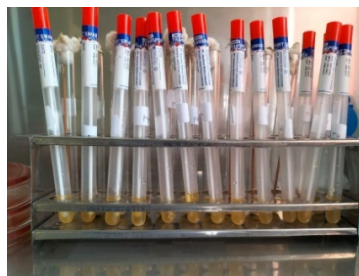


Figure 3. Samples on Nutrient Broth Media

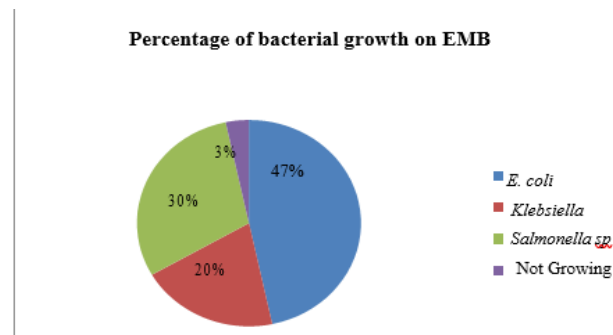


Figure 4. Percentage diagram for the presence of *Echerichia coli* bacteria on the palms of hands and questionnaires for Of Children at SDN X In Kediri City

Based on the picture above from 30 samples 29 samples identified the presence of bacteria and 1 sterile sample, identified bacteria including *Salmonella sp* (30%) also found *Klebsiella sp* (20%) and *Echerichia coli* (47%) bacteria.

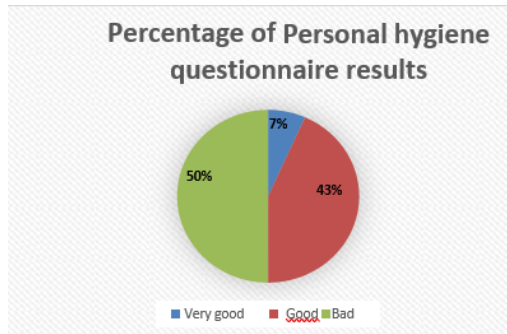


Figure 5. Personal hygiene percentage diagram on the palms Of Children at SDN X In Kediri City

Based on the picture above, the results show 2 people (7%) with very good personal hygiene, 13 people (43%) with good personal hygiene, and 15 people (50%) with poor personal hygiene. The results of the questionnaire that has been calculated will be tested for validity and reliability. The questionnaire must be tested for validity and reliability in order to know that the questionnaire used is valid and consistent.

In this research the validity measurement used the Pearson Correlation technique, the data is said to be valid because the significance value is <0.05 (sig. <0.05) if the significance value is > 0.05 (sig. > 0.05) then the data is clearly invalid. Based on the validity test with the Pearson Correlation technique, a significance value of <0.05 (sig. <0.05) was obtained.

1. Reliability Test

Table 2. Cronbach's Alpha Reliability Test Results

Reliability Test	
Cronbach's Alpha	N of items
.804	12

In this study the reliability test used Cronbach alpha. A data is said to be reliable if the Cronbach's Alpha value is > 0.6 . Based on the reliability test conducted, the Cronbach's Alpha value was 0.804, which means that the Cronbach Alpha value was > 0.6

2. Chi-Square Test

Uji Chi-Square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.850 ^a	4	.000
N of Valid Cases	30		

From the statistical test results, the Asymp.Sig result was 0.000 where the value was <0.05 , so it was said that there was a significant relationship, and it could be concluded that H_a was accepted and H_0 was rejected, so that there was a relationship between personal hygiene and the presence of *Echerichia coli* bacteria Of Children at SDN X In Kediri City.

According to Amin *et al*, 2023. The presence of bacteria on hands can be an intermediary for gastrointestinal infections such as diarrhea, acute respiratory infections (ARI) and skin diseases. Also agree with the results of the 2019 research by Kurniati *et al*.

The results obtained in this research were *Salmonella sp* bacteria (30%) from 9 samples, *Klebsiella* (20%) from 6 samples, and *Echerichia coli* (47%) from 14 samples. Not much different from the results of research by Kurniati *et al* in 2019. The results of research on hand swabs from a group of elementary school (SD) students who lived along the river showed 70% *Staphylococcus aureus* and 30% *Escherichia coli*, while in a group of elementary school students who lived in Outside the riverbanks, *Staphylococcus aureus* was found at 66.7% and *Escherichia coli* at 33.3%. Meanwhile, according to Budiarti in 2016, on the hands of elementary school students on the banks of the Kuin River, it was stated that *Staphylococcus aureus* was the bacteria that dominated on the hands of elementary school students on the banks of the Kuin River, Banjarmasin, namely 67.7%, followed by *Escherichia coli* at 23.3% and *Staphylococcus epidirmidis* at 10 %. In the results of other research conducted by Budiarti in 2017, it was stated that the results of bacteria on the hands of students at SD Alalak Utara Banjarmasin were not much different, namely *Staphylococcus aureus* as much as 67.5% and *Escherichia coli* as much as 32.5%.

The research used EMB selective media but the media can be overgrown with other bacteria as in the results, namely *Klebsiella* and *Salmonella Spp*. According to (Hasnaul, *et al.*, 2017) the growth of bacteria other than *Echerichia coli* and *Klebsiella* on EMB media is because EMB media is a selective media capable of inhibiting the growth of Gram-positive bacteria so that they can grow Gram-negative bacteria, and according to the EMB media



catalog the media can grow bacteria. apart from *Echerichia coli* and *Klebsiella* but other bacteria such as *Salmonella sp* and *Proteus* can grow. Based on the questionnaire filled out by the respondents, the results of personal hygiene were very good, good and bad. In very good personal hygiene there was no growth of any bacteria in one sample, in good personal hygiene the average was *E.coli* bacteria and in bad personal hygiene the average was *Salmonella sp*. *E. coli* bacteria can be found on the hands of elementary school children with good personal hygiene values because children always wash their hands but don't use soap and running water. Meanwhile, *Salmonella sp* bacteria were found on the hands of elementary school children due to bacterial contamination on hands that came into direct contact with human, animal feces or other body fluids such as snot and food and drink contaminated by flies and did not wash their hands with soap. (Hasanah and Mahardika, 2020).

From the results of the research entitled the relationship between personal hygiene and the presence of *Echerichia coli* bacteria in the palm swabs of Children at SDN X In Kediri City, it was found that there was a significant relationship in the statistical test because the results showed an Asymp.Sig value of 0.000 where the value was <0.05 where H_a was accepted and H_0 was rejected. Statistical results are supported by research (Luby *et al.*, 2009), that maintaining personal hygiene, especially washing hands can reduce the presence of *Coliform* bacteria that can survive in the palms of the hands.

CONCLUSION AND SUGGESTION

Based on the results of the research concluded that there is a relationship between personal hygiene and the presence of *Echerichia coli* bacteria on the palms of children at SDN X In Kediri City as evidenced by a Chi-Square value of <0.05 . For future researchers, this can be done with more samples and the presence of *Echerichia coli* bacteria than other bacteria and add to the research by counting the number of bacteria to make it more specific.

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