

# The Prevalence of Intestinal Bacteria due to Hand Washing Habit and Snacking among Elementary School in Surabaya

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## Abstract

Elementary school age is the age which child really loved to play and to buy snacks at school. Therefore, there are so many health problems could treaten the elementary school aged children. The objectives of this study are to calculate the prevalence of intestinal bacteria on the elementary school aged children and to descriptive the intestinal bacteria whereabouts duo on children's hand washing and snacking habit at school. A descriptive observational with cross sectional design was used. Samples are 58 students at Elementary school in Wonokromo District, Surabaya. Data were collected using questionnaire and by examining the feces which taken and brought at the morning as requested. Laboratory testing was done to identify instestinal bacteria in feces. The results showed that prevalence of the intestinal bacteria in the elementary school aged children is 6.89%. The types of bacteria which found are *Escherichia coli* O157:H7 and *Shigella flexeneri*. The prevalence of intestinal bacteria on children who always wash their hand is 4.2% and 13.6% founded in them who do it occasionally. The prevalence of intestinal bacteria on children who loved to buy snack at school is 6.9%. The result showed that there are only 3 children who didn't buy any snack at school.

**Keywords:** Intestinal Bacteria, Hand Washing, Snacking, Elementry School.

## I. INTRODUCTION

Elementary school age (about 6-12 years old) is the age where child really loved to play and to buy snacks at school and at the area around the school. Therefore, there are so many health problems that could infect elementary school aged children. A health problem that often occurs is the Foodborne Diseases. Foodborne disease is a disease caused by consuming food and/or drink contaminated. Foodborne disease is caused by a variety of microorganisms or microbial pathogens that can contaminate food or beverages. Foodborne disease is caused by microbes occurring through contaminated water, cutlery / drinking and intermediary vectors such as flies and cockroaches. Types of foodborne disease include food poisoning, diarrhea, dysentri, typhoid, cholera and others (Rozendaal, 1997). Foodborne disease risk behaviors in children at the elementary school age are usually related to personal hygiene and the habit of eating snacks that are less well at school. Elementary school children have immunity that are more vulnerable than adults. Surabaya City Health Department data showed that the increasing number of diarrhea were addressed to children aged 5-14 years. In 2014, there were 4,131 male and 3,968 female who got a diarrhea and it increased with 4,220 male and 4,019 female. The increasing cases of diarrhea among school children is one proof that the hygiene of street food is still a concern :however; children spent most of their time in school and consumed foods that do not have safety level guaranteed . In addition, children at the school age tend to have a poor Clean and Healthy Lifestyle (PHBs) , especially at school, so there are chances of microbial pathogens such as *Escherichia coli* and *Shigella flexeneri* to enter into their body. The objectives of this study are: (1) to calculate the prevalence of intestinal bacteria Among elementary school children and (2) to describe the intestinal bacteria whereabouts children's hand washing and snacking habits at school

## II. METHODS

A descriptive observational with cross sectional study design was used. Research in Elementary School in Wonokromo sub-district in Surabaya. The population in this study were all children and still active as the fourth and fifth grade student. Samples are 58 elementary students. Data were collected using questionnaire for characteristic data, hand washing and snacking habit and by examining the feces which taken and brought at the morning as requested. Laboratory testing (Mac Conkey-Sorbitol) was done to identify intestinal bacteria in feces (Elliott, et al., 2013). Collected data are proceed by editing, entry, cleaning, descriptive analysis and it's presented in narration and tables.

## III. RESULTS

### A. Children characteristic

Characteristics of children identified in this study includes sex, age, the number of weekly allowance, and an exposed history of Foodborne Diseases (diarrhea, typhoid fever, hepatitis A). More can be seen in table 1 below.

Table 1. Character Distribution of the Student

No.	Characteristics	Total	Percentage (%)
1.	Sex		
	Male	32	55.2

	Female	26	44.8
	n	58	100.0
2.	Age (years old)		
	8 – 9	23	39.6
	10 – 11	35	60.4
	n	58	100.0
3.	Weekly allowance		
	< Rp. 20,000,-	14	24.2
	Rp. 21,000 – Rp. 30,000,-	39	67.3
	> Rp. 30,000,-	5	8.5
	n	58	100.0
4.	3 months absence due to illness		
	Yes	24	41.4
	No	34	58.6
	n	58	100.0
5.	Diarrhea ( for 3 months)		
	Yes	18	31.0
	No	40	69.0
	n	58	100.0
6.	Ever got typhoid		
	Yes	7	12.1
	No	51	87.9
	n	58	100.0
7.	Ever got Hepatitis A		
	Yes	1	1.7
	No	57	98.3
	n	58	100.0

**B. The prevalence of intestinal bacteria among elementary school children**

The results of feces examination of 58 children, found four positive bacterial pathogens. The results showed that the prevalence of intestinal bacteria among elementary school children is 6.89%. The types of bacteria found are Escherichia coli O157: H7 and Shigella flexeneri.

Table 2. Types of intestinal bacteria

No.	Types	Total	Percentage (%)
1.	E coli O157:H7	2	3.45
2.	Shigella flexeneri	2	3.45
	No founded (negative)	54	93.10
	Total	58	100.0

**C. Description about the intestinal bacteria due on children's hand washing and snacking habit at school**

In this study, hand washing examined included the habit of washing hands before eating during recess school, wash their hands after playing in the school and wash hands after defecation in school. Children who always wash hands before eating at school only 24 people (41.4%), whereas 22 (37.9%) said occasionally, and 12 (20.7%) said never. Children who claimed never to have to wash their hands with soap after they finish playing in the school as many as 27 people (46.6%), 21 (36.2%) said occasionally, and 10 people (17.2%) reported always wash hands with soap after they finish playing in school. Results score for hand washing in children can be seen in Table 3 below.

Table 3. Description about the intestinal bacteria and children's hand washing habit at school

Hand Washing Habit	The Intestinal Bacteria				Total	
	Positive		Negative		N	%
	n	%	n	%		
Bad	2	50.0	11	20.4	13	22.4
Moderate	1	25.0	25	46.3	26	44.8
Good	1	25.0	18	33.3	19	32.8
Total	4	100.0	54	100.0	58	100.0

The research result shows that the majority (50.0%) children, that were positive on having intestinal bacteria, have a bad hand washing habits, while the majority (46.3%) children that have negative intestinal bacteria, have a habit of hand washing in medium level. In children who have a poor hand washing habits, they say that the lazy to wash their hands because they have to go to the bathroom and no parents watching.

In this study, the habit of eating snacks is examined. It is included the habit of eating snacks as a substitute for breakfast, the habit of buying food / drinks in schools, the location of snacks, the habit for paying attention to hygiene of the snacks vendor and its surrounding, buying snacks with sealed containers or in containers and pay attention to the expiration date. Children who claimed never have snacks in the morning before school as a substitute for breakfast in the school is 33 children as many as 33 children (56.9%), 18 children (31.0%) stated that sometimes they have snack , and 7 children (12.1%) reported that they always have snack in the morning before school as a substitute for school breakfast. Of the 58 children, only 3 children (5.2%) who say never having snack at school, while 26 children (44.8%) always having snacks in schools and 29 children (50.0%) said that they sometimes buying snacks at school. There are 26 children (44.8%), who claimed never consider the hygiene of the environment around the snack vendor (scattered garbage, flies / cockroach, animal / human waste) will buy street food in schools. Meanwhile, 18 people (31.0 %) stated sometimes pay attention to the surrounding before buying snack, and only 14 children (24.1%) reported always examine the hygiene of the snack vendor and its surrounding. For the habit of reading the expired date of each purchase snack food, there were 33 children (56.9%) stating always reading, and 16 (27.6%) said never, and 9 children (15.5%) stated that sometimes they read the expired date of the snack. The results of the score habit of eating snacks can be seen in Table 4 below.

*Table 4. Description about the intestinal bacteria and children's snacking habit at school*

Snacking Habit	The Intestinal Bacteria				Total	
	Positive		Negative		N	%
	n	%	n	%		
Bad	0	0	0	0	0	0
Moderate	4	100.0	48	88.9	52	89.7
Good	0	0	6	11.1	6	10,3
Total	4	100.0	54	100.0	58	100.0

The result of the study shows that all of children that are positive intestinal bacteria has a bad habit of eating snacks, while the majority (88.9%) of children who are negative intestinal bacteria, also have a habit of eating snacks sometimes.

#### IV. DISCUSSION

Children snacking habit cannot be ignored because snacks can complement or add input energy and other nutrients for children. Snack habits can impact positively or negatively. If the snack already meets the requirements of health, snack habits can have a positive impact. In the contrary, it can be dangerous for health if it does not meet the health requirement. As a result of lack hygiene is the occurrence of pathogenic microbes in the children feces where it means that children have risk for the occurrence of foodborne disease (FBDs). The results of stool examination showed that there is a positive 6.89% contained pathogenic bacteria such as *Escherichia coli* O157: H7 and *Shigella flexineri*. *Escherichia coli* bacteria are mostly normal flora for humans, but the serotype O157: H7 is a bacterial pathogen that can cause health problems in humans, Including Foodborne Diseases. These bacteria can be passed from animal to animal, from animal to human or from human to human (Sandjaja et al, 2009). Shiga toxin production of *Escherichia coli* (STEC / Shiga Toxin producing *Escherichia coli*) is an agent of Foodborne Diseases (Son, I, et.al, 2014). Personal hygiene is one of the factors that can affect the safety of food / drink. Food / drinks can be contaminated with microbes from unwashed hands that can cause health problems if food / beverage is consumed. The most important effort in maintaining personal hygiene related to the prevention of diseases transmitted through food / drinks includes hand washing with soap and running water (Ministry of Health, Republic of Indonesia, 2012). In accordance with the results of studies it appears that 50.0% of children were positive intestinal bacteria in feces, have a poor hand washing habits. Whereas children are negative intestinal bacteria in the feces only 20.3% of children who have poor hand washing habits.

Snack or food which is safety is a snack food that does not contain a hazard food / beverage comprising of biological / microbiological, chemical and physical properties that may disturb, harm and endanger human health (MoH RI, 2012). The results of the sample inspection by a child snacks Monitor of Food and Drugs Agency (BPOM) in 2007, as many as 45% of food snacks sold in school is not safe because it contains harmful chemicals, food additives (BTP) exceeds safe limits and microbial contamination. In research on food security found that food contamination occurs due to the discovery of microbes (*E. coli*) in the bathroom, toilet, kitchen, refrigerator and tap water (Azevedo, et.al, 2014).

Almost all school children have the snacking habit at school's canteen and street food outside the school fence. Although the children had brought lunch from home, they still buy food or drinks at school. The results showed that every day children bring money for buying snack.. When viewed from the measurement habit of eating snacks, most children have the habit of eating snacks medium level, this may be an indication of children at risk of Foodborne Diseases. The result of Puspitasari research in 2013 found the presence of intestinal bacterial contamination (diantarnya E.coli) in the food and drink samples snacks around the school. Bacterial contamination in food snacks can be derived from the hands of food handlers, as well as research Sartika in 2005 as many as 41.7% handlers hands were contaminated with E coli O157: H7. Research at the elementary school in West Java concluded that there is a relationship between hygiene of food handlers to the presence of bacteria on food snacks ( $p = 0.001$ ) (Riyanto, et al, 2012). Results of this study showed that was only 24.1% of the children who pay attention to cleanliness and hygiene of the street food vendor outlets. Research in Surabaya found that school canteens are not eligible in hygiene sanitation catering services (Nugroho, 2014) as well as food sold in school canteens and the outside area does not have appropriate sanitary hygiene requirements (Riolita, RR, 2015).

## V. CONCLUSION

The conclusion of this research is that the prevalence of intestinal bacteria is 6.89% and most of children have a hand washing habit at school and the snacking habit at school is in the moderate level.

## VI. SUGGESTION

This research suggested the need of training about how to do hand washing correctly and to choose healthy snacks, because most of students ever buying at school.

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