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### The Relationship between Clean Water Facilities and Latrine Use with the Incidence of Diarrhea in Toddlers in KB Bagan Percut Village, Percut Village, Deli Serdang

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#### Article Information ABSTRACT

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Diarrhea is a disease that is greatly influenced by the environment, especially clean environmental sanitation and the use of proper toilets. If both of these facilities are contaminated, the risk of contracting diarrhea will increase. This study aims to determine the relationship between clean water facilities and toilet use with the incidence of diarrhea in toddlers in the Percut Village Family Planning Village. This study was conducted in the Bagan Percut Village Family Planning Village, Percut Village, Percut Sei Tuan District using quantitative methods and cross-sectional design. The population in this study were all mothers who had toddlers totaling 256 people, and the number of samples taken was 72 toddlers. The results of data analysis using statistical tests showed that there was a significant relationship between clean water facilities ( $p = 0.003$ ) and toilet use ( $p = 0.000$ ) with the incidence of diarrhea in toddlers. The p-value obtained was less than 0.05 indicating that the relationship between these variables was significant. Thus, it can be concluded that there is a significant relationship between clean water facilities and toilet use with the incidence of diarrhea in toddlers in the Bagan Percut Village Family Planning Village, Percut Village, Percut Sei Tuan District. Therefore, it is important to improve the quality of clean water facilities and the use of proper toilets to prevent diarrhea in toddlers. This study is expected to be a reference for improving environmental health and preventing diarrhea in toddlers in the area.

## Introduction

Coastal communities are groups of people who live together in coastal areas whose livelihoods depend on coastal natural resources which are greatly influenced by environmental factors.<sup>1</sup>

Some examples of diseases that occur in coastal environments, one of which is diarrheal disease which is caused by poor water sanitation and minimal use of latrines in these communities. Diarrhea is an environmentally based disease, the factors that cause this disease are influenced by clean water facilities and infrastructure and the use of latrines. This disease can be transmitted through water.<sup>2</sup>

Sanitation of clean water facilities and family toilets must meet physical building requirements to avoid contamination of these two facilities. If these two facilities are contaminated, there is a risk of infection with diarrhea. Diarrhea can infect all age groups, including toddlers, so it is closely related to the condition of providing clean water and the use of household toilets with the incidence of diarrhea. There are many factors that directly or indirectly encourage the occurrence of diarrhea, namely the physical environment.<sup>4</sup> The most dominant physical environmental factors are facilities for providing clean water, ownership of healthy latrines, and waste water disposal channels.<sup>5</sup>

According to data World Health Organization, diarrhea is an environmentally based disease and occurs in almost all geographical areas in the world. Around 1.7 billion cases of diarrhea occur each year and result in the deaths of 760,000 children under the age of five.<sup>2</sup>

In developing countries, children under three years of age suffer from diarrhea an average of three times a

year. Diarrhea is still a common problem in Indonesia, both in children and adults.

The 2019 Indonesian Health Profile shows that 2,549 people in this country suffer from diarrhea, with a case fatality rate (CFR) of 1.14%. Based on age characteristics, diarrhea most often affects young children in Indonesia (7.0%). The 6 to 11 month age group is the group of babies who suffer the most from diarrhea with an incidence rate of 21.65%. The age groups 12–17 months (14.43%) and 24–29 months (12.37%) were the next groups.

It is estimated that around 200 to 400 cases of diarrhea occur per 1,000 people each year, resulting in more than 60 million cases of diarrhea each year, which occurs in almost all regions of Indonesia.<sup>6</sup>

In North Sumatra, based on the Central Statistics Agency (BPS), in 2020, North Sumatra Province reported 70,243 cases of diarrhea throughout North Sumatra Province, with Medan City being the city with the highest number of diarrhea cases, namely 10,047 cases of diarrhea. Based on the report from the Medan City Health Service, Medan Deli Community Health Center had the highest number of diarrhea cases in young children, namely 1,729 cases.

Diarrhea caused by *E. coli* is a picture of a disease that is transmitted and spread through the air, or an infection that is transmitted through the air. Because feces have contaminated water supplies, *E. coli* is usually detected in clean water sources. The behavior of littering, non-compliant toilets, uncontaminated water supplies, and non-compliant individuals are the main causes of fecal contamination of clean water sources in society.<sup>7</sup>

public. The results of observations carried out in Deli Serdang Regency, Percut Sei Tuan District, Percut Village, and KB Bagan Percut Village show that some people still throw rubbish near canals and rivers which are sources of clean water. Due to their behavior, they still throw rubbish carelessly. This can cause the clean water sources they use to become polluted, which can certainly become a source of disease. If a toilet (septic tank) is installed next to a clean water source, the water source can be contaminated with diarrhea-causing bacteria found in feces.

Based on the results of these observations, research was conducted on the relationship between the use of toilets, clean water facilities, and the prevalence of diarrhea in Percut Village, Percut Sei Tuan District, Deli Serdang Regency, based on the findings of these observations. The overall aim of the research was to determine the relationship between the incidence of toddler diarrhea, use of toilets, and clean water facilities. The specific aim of this research is to find out whether the incidence of toddler diarrhea is related

to the use of toilets and clean water facilities.

### Research Methods

This research is quantitative and analytical description to study health phenomena that may occur diarrhea. Method used is a cross-sectional method where the independent variables and dependents are measured simultaneously. The incidence of diarrhea is the dependent variable in this study, while clean water facilities and toilet availability are independent factors.

Observations were carried out in KB Bagan Percut Village in Percut Village, Percut Sei Tuan District, with the population in this study being all mothers with toddlers who were registered at the KB village health center, totaling 256 people. The sample size was calculated using the Lameshow formula to obtain a result of 72.

This research uses direct observation related to physical health, environmental sanitation and interview data collection techniques. Univariate and bivariate chi-square tests with a p value of 0.05 were used in data analysis

## Results

### Univariate Analysis

Univariate analysis was used to describe the characteristics of respondents

which is presented in a frequency and percentage distribution table.<sup>8</sup>

**Table 1. Respondents' Characteristic**

Category	Respondent Group	
	N	%
<b>Mother's Age</b>		
18 – 30 Years	47	65.3
30 – 40 Years	25	34.7
<b>Toddler Age</b>		
23 – 35 Months	8	11.1
36 – 48 Months	25	34.7
49 – 58 Months	39	54.2

<b>Toddler Gender</b>		
Man	38	52.8
Woman	34	47.2
<b>Total</b>	<b>72</b>	<b>100%</b>

Based on table 1. above, the majority or majority of mothers' ages are in the 18 - 30 year old range, 47 (65.3%) people, then the majority of

toddlers are in the 49 - 58 month old range, 39 (54.2%) people. and the majority or majority of toddlers' gender is male, 38 (52.8%).

**Table 2. Frequency Distribution of Respondents by Type of Clean Water Facilities and Family Latrines in KB Bagan Percut Village in Percut Village, Percut Sei Tuan District**

<b>No.</b>	<b>Types of Clean Water Facilities</b>	<b>Amount</b>	<b>%</b>
1.	Dig Well	9	12.5%
2.	River	50	69.4%
3.	Piping	10	13.9%
4.	Boreholes	3	4.2%
<b>Total</b>		<b>72</b>	<b>100%</b>
<b>Types of Family Latrines</b>			
1.	Squat pit latrine	55	77%
2.	Gooseneck Without Septitank	10	13.9%
3.	Goose Neck With Septic Tank and Absorption	7	9.1%
<b>Total</b>		<b>72</b>	<b>100%</b>

Based on table 2. above, the results show that of the 72 respondents, the majority or almost the majority of respondents use clean water from rivers that are not clean.

50 respondents (69.4%) met the physical requirements for water that is tasteless, colored and odorless. And of the 72 respondents, the majority of respondents used the sink type latrine, namely 55 respondents (77%).

### **Bivariate Analysis**

Bivariate analysis was carried out to determine the relationship between two variables, namely the independent variable and the

dependent variable and to find the magnitude of the relationship between the two variables, it was carried out using the chi square test.

**Table 3. Relationship between clean water facilities and the incidence of diarrhea in toddlers in Bagan Percut KB Village in Percut Village, Percut Sei Tuan District**

Clean Water Facilities	Diarrhea Occurrence						P - value
	Diarrhea		No diarrhea		Amount		
	n	%	n	%	N	%	
Not Eligible	40	55.6	6	8.3	46	36.9	0.003
Qualified	10	13.9	16	22.2	26	36.1	
<b>Total</b>	<b>50</b>	<b>69.5</b>	<b>22</b>	<b>30.5</b>	<b>72</b>	<b>100</b>	

From Table 4 above, of the 46 respondents whose clean water did not meet the requirements, there were 40 (55.6%) toddlers suffering from diarrhea. 6 (8.3%) Even though clean water was available, 10 of the 26 respondents who met the requirements apparently did not suffer from it. diarrhea. Although toddlers suffer from diarrhea, 16 (22.2%) toddlers do not

suffer from diarrhea. And based on the results of the chi square test said that there was a significant relationship between clean water supply and the incidence of diarrhea in children in KB Bagan Percut Village, Percut Sae Tuan District, Percut Village, p-value = 0.003 < 0.05.

**Table 4. Relationship between the use of toilets and the incidence of diarrhea in toddlers in the Bagan Percut KB Village in Percut Village, Percut Sei Tuan District**

Toilet	Diarrhea Occurrence						P - value
	Diarrhea		No diarrhea		Amount		
	n	%	n	%	N	%	
Not Eligible	49	68.5	7	9.72	56	77.7	0,000
Qualified	7	9.72	9	12.5	16	22.2	
<b>Total</b>	<b>50</b>	<b>69.5</b>	<b>22</b>	<b>22.2</b>	<b>72</b>	<b>100</b>	

Based on table 5, it can be seen that of the 56 respondents whose latrine use did not meet the requirements, 49 (68.5%) toddlers suffered from diarrhea and 7 (9.72%) toddlers did not suffer from diarrhea, while of the 16 respondents who met the requirements as many as 7 (9.72%) suffered from diarrhea and as many as 9 (12.5) toddlers do not suffer from diarrhea. And based on the results of the chi square test, it shows that there is a relationship between latrine use and the incidence of diarrhea in early childhood in the KB Bagan Percut village in Percut village, Percut Sei Tuan sub-district with p value = 0.000 < 0.05.

## Discussion

### The Relationship between Clean Water Facilities and the Incidence of Diarrhea in Toddlers

The p value of clean water facilities is 0.003 or less than the sig value = 0.05, according to research findings, indicating a correlation between clean water facilities and the incidence of diarrhea. As an airborne disease, diarrhea can spread through the atmosphere. Toddlers who use poor clean water sources have a 3.28 times risk of developing diarrhea.

This can happen because clean water facilities do not meet health requirements, such as sources of clean

water from drilled wells, dug wells and rivers, where the water can be contaminated with microorganisms or bacteria that can cause diarrhea. Transmission of diarrhea can occur through contamination of clean water sources contaminated with infectious bacteria.<sup>9</sup>

This bacteria can cause diarrhea, especially in children, if it comes into contact with unclean hands, contaminated food containers, and drinking water that is not properly boiled.

Based on the results of our observations, it shows that for clean water sources, most people still use river water, the quality of which is not always good or at times it is not always clean and there are also those who use their clean water sources from dug wells but the condition of their wells is not closed, so This can trigger germs or bacteria to grow in the water, which can trigger diarrhea.

The results of the research carried out are in line with the results of Miki's research (2020)<sup>10</sup>, that the provision of clean water influences the occurrence of diarrhea with a value of  $p = 0.003$ . And it is also in line with research conducted by Fitri (2021)<sup>11</sup> that there is a relationship between water sources and the incidence of diarrhea with a value of  $p = 0.01$ .

So, to prevent the occurrence of diarrhea, it is highly hoped that every citizen can start improving and evaluating their clean water sources which definitely meet clean water health standards because the quality of clean water certainly has a close relationship with the occurrence of diarrhea and when every citizen has started modifying the water source. Cleaner will definitely be healthier.

So people who have clean water supplies have a lower risk of

### **Correlation between latrine use and the incidence of diarrhea in toddlers**

Based on the research results, it is known that the  $p$  - value of latrine use is 0.000 or  $< \text{sig a value} = 0.05$ , which shows that there is a relationship between latrine use and the incidence of diarrhea.

Stool processing is also an issue is action cleanliness Which related with epidemic diarrhea. Unhygienic waste disposal places reduce the length of time that diarrheal disease spreads. Health regulations state that in order to dispose of waste, the surrounding land surface must not be contaminated, the air in the land and surrounding surfaces must not be contaminated, and the waste itself must not be exposed to exposure that could serve as a hazardous substance. a breeding ground for pathogens and flies.

So based on this, it can be said that latrines can be a trigger for disturbances in the surrounding community, therefore having a toilet that definitely meets the requirements in every house is the main solution for the occurrence of diarrheal disease. Because using a good latrine that definitely meets the requirements has the potential to reduce the risk of diarrhea.

Usually, people who suffer from diarrhea have a pit latrine which is located outside the house or is located far from the house so that people rarely or are lazy to use the latrine, so they practice indiscriminate disposal of feces, which facilitates the spread of diarrheal disease through feces.<sup>12</sup>

The type of location where feces are disposed and the practice of open defecation in a family will double the risk of infection in toddlers when compared to households that do not practice this behavior. Apart from that, there are other factors that cause this, such as poor personal hygiene by mothers of young children.<sup>4</sup> For example, mothers do not wash their hands first when they want to breastfeed their children or do other If a family member is infected with an illness,

developing diarrhea than people who have minimal clean water supplies activities.<sup>13</sup>

The survey results show that some mothers still throw away their small children's sanitary napkins and trousers into trash cans, ditches, rivers, etc. without washing them. Separately, the baby's mother also said that the baby was still using disposable sanitary napkins and trousers that collect urine and feces, and would immediately throw them away along with the sanitary napkins and trousers after use.

. With mothers' behavior like that, it could be said that this could lead to diarrhea because they do not use toilets that meet the requirements.

This is in line with research conducted by Apriani (2022)<sup>14</sup>, which revealed that there was a p value of 0.000, which means there is a relationship between the incidence of toddler diarrhea and toilet use in Cigugur Village, Sukamulya Health Center Working Area, Kuningan Regency..

The research results are also in line with Juariah's (2018)<sup>15</sup> research results which concluded that there is a relationship between latrine ownership and the incidence of diarrhea. Other research states that feces processing plants are not only a source of drinking water but also important sanitation facilities that influence the incidence of diarrheal diseases.

Throwing away diapers and pants that do not meet hygiene requirements can pollute the household environment, soil and water sources. A contaminated environment can be made worse by unhealthy human behavior, improper hand washing after working or playing on the floor (children), eating and drinking, and can cause diarrhea. Therefore, to prevent diarrhea in children under 5 years old, every home is expected to have a toilet that meets health regulations for both urination and defecation. Using

especially diarrhea, it can cause illness.

### Conclusion

The results of this observation using statistical tests showed that there was a link between clean water facilities ( $p = 0.003$ )  $< 0.05$  and latrine use ( $p = 0.000$ )  $< 0.05$  with the incidence of diarrhea in toddlers in KB Bagan Percut Village, Percut Village, Percut Sei Tuan District. Based on the research results, it can be concluded that there is a significant relationship between the provision of clean water and the use of latrines on the incidence of diarrhea among toddlers in the Bagan Percut family planning village in Percut village, Percut Sei Tuan sub-district.

### Suggestion

It is recommended that village/village heads and health workers provide outreach to motivate the community to obtain and use clean water and latrines that meet the requirements. Apart from that, all residents are asked to always maintain personal and environmental cleanliness.

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