The 4rd Mitra Husada Health International Conference (MiHHICo) 2024
Volume 4 (2024) ISSN: 2988-3768

THE RELATIONSHIP BETWEEN ENVIRONMENTAL HEALT FACTORS AND THE INCIDIENCE OF DIARRHEA IN TODDLERS IN WORKING AREA OF THEUPTD PUSKESMAS GUNUNGSITOLI IDANOI

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ABSTRACT

The environmental conditions in the homes of toddlers suffering from diarrhea show that most of the clean water facilities do not meet health requirements, for example they are not protected from sources of pollution. Likewise, most of the latrine facilities do not have waterproof floors, are slippery, and flow directly into the river. Waste management is still far from health requirements and most rubbish bins do not have covers, there is no separation of organic and inorganic waste. Household waste water drainage channels are still close to the house, which creates a breeding ground for vectors that can carry disease. The aim of this research is to analyze the relationship between clean water facilities, latrine facilities, waste management, waste water drainage management and the incidence of diarrhea in the work area of the UPTD Puskesmas Gunungsitoli Idanoi District. The type of research is quantitative and cross sectional research, researchers analyzed data from 4,485 families, obtained through questionnaire and observation methods, data were analyzed using the chi-square test with a confidence level of 95%. Results through statistical tests showed that all variables were related to the incidence of diarrhea in toddlers in the UPTD work area of the Gunungsitoli Idanoi District Health Center.All variables studied are related to the incidence of diarrhea, so various efforts need to be madethe role of the community and health workers in improving the quality of a healthy environmentwhich is related to the incidence of diarrhea in the UPTD work area of the Gunungsitoli Idanoi District Health Center.

Key words: diarrhea, health center, environmental health.

INTRODUCTION

According to WHO and UNICEF, there are around 2 billion cases of diarrhea and 1.9 million children under five die from diarrhea worldwide every year. Of all these deaths, 78% occurred in developing countries, especially in Africa and Southeast Asia (Ministry of Health of the Republic of Indonesia, 2019). Every year there are around 1.7 billion cases of diarrhea with a death rate of 760,000 children under 5 years. In developing countries, children under 3 years of age experience an average of 3 episodes of diarrhea per year. Based on the 2019 Indonesian Health Profile, it shows that the number of diarrhea sufferers in Indonesia was 2,549 people and the Case Fatality

Rate (CFR) was 1.14%. According to age characteristics, the highest incidence of diarrhea in Indonesia occurs in toddlers (7.0%). The largest proportion of diarrhea sufferers in toddlers with the highest incidence was in the 6-11 month age group, namely (21.65%). Then the 12-17 month age group was (14.43%), the 24-29 month age group was (12.37%). The most common diseases in toddlers that are managed with Integrated Management of Toddler Illness (IMCI) are diseases that are the main cause of death for toddlers, including pneumonia, diarrhea, malaria, measles, and conditions that are aggravated by nutritional problems. Diarrhea is still a major health problem in children, especially in developing countries like Indonesia (Dewi, 2020).

Basic Health Research in 2018 stated that the prevalence of diarrhea in Indonesia for all age groups was 8% and the prevalence rate for toddlers was 12.3%, while for babies, the prevalence of diarrhea was 10.6%. Meanwhile, in the 2018 Sample Registration System, diarrhea remained one of the main causes of death in neonates at 7% and in babies aged 28 days at 6%. Data from Komdat Public Health for the period January - November 2021, diarrhea causes postneonatal deaths by 14%. The latest data from the results of the 2020 Indonesian Nutrition Status Survey, the prevalence of diarrhea is at 9.8%. Diarrhea is closely related to the occurrence of stunting cases. Repeated diarrhea in babies and toddlers can causestunting. Based on data from the 2020 Indonesian Health Profile, infectious diseases, especially diarrhea, are a contributor to death in the group of children aged 29 days - 11 months. Just like the previous year, in 2020, diarrhea is still the main problem causing 14.5% of deaths. In the group of children under five (12-59 toddlers), deaths due to diarrhea were 4.55% (Ministry of Health of the Republic of Indonesia, 2022).

According to the North Sumatra Province Health Profile (2020), diarrhea is an endemic disease with the potential for an Extraordinary Event (KLB) which is often accompanied by death in North Sumatra Province. The number of diarrhea sufferers of all ages (SU) served was 214,438 people or 45.13%. In 2019, the number of toddler diarrhea sufferers served was 70,243 people or 27.74%. According to the Central Bureau of Statistics (BPS, 2023) North Sumatra reported that Gunungsitoli City had 440 total cases of diarrhea in 2022 reporting, while in 2023 cases of diarrhea recorded in BPS North Sumatra were stillthe same, namely 440 cases of diarrhea sufferers (North Sumatra Health Office, 2020).

Several factors are related to the incidence of diarrhea, one of which is environmental factors which encourage the occurrence of diarrhea in several regions in Indonesia. The environmental factors that influence diarrhea are the provision of clean water or the provision of drinking water, waste disposal (facilitieslatrines), waste water disposal management (SPAL),

and waste management. The results of research (Miki Kurnia Fitrizah, 2020) show that there is a relationship between the provision of clean water and ownership of a latrine and the incidence of diarrhea in toddlers (p value=0.003). The results of research (Puang, 2021) show that there is a relationship between waste management and the incidence of diarrhea (p value=0.003). According to research (Dina Aolina, 2020) there is a significant relationship between SPAL and the incidence of diarrhea (p value=0.009).

The results of an initial survey conducted in the UPTD work area of the Gunungsitoli Idanoi District Health Center show that diarrhea is still a public health problem. In 2023 at the Gunungsitoli Idanoi District Health Center there will be 78 cases of diarrhea or around 9.8% of the total cases in toddlers in the last 3 months starting from October-December and from observations in several areas affected by diarrhea they do not fully meet environmental health standards that support there were no cases of diarrhea.

On the other hand, the results of observations made on the condition of the homes of toddlers suffering from diarrhea show that most of the clean water facilities do not meet health requirements, for example they are not protected from sources of pollution because they do not use barriers to ground surface water. Likewise, partial toilet facilitiesLarge ones do not have waterproof floors, are slippery, and flow directly into the river. Waste management is still far from health requirements. Observation results show that most of the trash cans do not have covers, there is no separation of organic and inorganic waste. Household waste water drainage channels are still close to the house, which creates a breeding ground for vectors that can carry disease.

If this situation is allowed to continue, it is possible that the number of diarrhea sufferers will increase and take many victims, this is the background for this research to be carried out.

Based on the explanation above, this research aims to analyze the relationship between environmental health factors and the incidence of diarrhea in toddlers in the UPTD work area of the Gunungsitoli Idanoi District Health Center.

METHOD

The type of research is quantitative analytical research, namely research that determines environmental health factors related to the incidence of diarrhea which include: clean water facilities, latrine facilities, waste management, and waste water drainage channels with the incidence of diarrhea in toddlers. The research design used in this research is cross sectional, that is, data collection on the independent variable and dependent variable is carried out at the same time.This research was conducted in the work area of the UPTD Community Health Center, Gunungsitoli Idanoi District, Gunungsitoli City, North Sumatra Province, starting from December 2023-

May 2024. The population in this study were all families with toddlers in the UPTD Community Health Center area of Gunungsitoli Selatan District in at the time of the initial survey there were 4,485 heads of families. The number of samples in this study was determined using the Slovin formula to obtain a sample size of 98 people using a simple random sampling technique. Data was collected through interviews with the help of questionnaires and observations. Data analysis was carried out univariately to describe the frequency distribution of each variable. Bivariate analysis was carried out using the chi-square test at the 95% confidence level, $\alpha < 0.05$.

RESULTS AND DISCUSSION

Respondent Characteristics

The characteristics of the respondents in this study are as follows:

Table 1. Characteristics of Respondents

No	Characteristics	Amount	percentage
1	Age group (years)		
	a) <30 years	42	42.9
	b) 31 – 40 years	39	39.8
	c) 40 – 50 years	17	17.3
2	Gender		
	a) Male	18	18.4
	b) Female	80	81.6
3	Level of education		
	a) Basic Education	15	15.3
	b) Secondary Education	62	63.3
	c) Higher Education	21	21.4
4	Type of work		
	a) Housewife	45	45.9
	b) ASN/Polri/TNI	7	7.1
	c) Private employees	14	14.3
	d) Self-employed	9	9.2
	e) Farmers/Fishermen/Laborers	23	23.5
5	Toddler age category		
	a) < 12 months	20	20.4
	b) 12 – 23 months	18	18.4
	c) 24 -35 months	23	23.5
	d) 36 – 47 months	16	16.3
	e) 48 -59 months	21	21.4
6	Toddler gender		
	a) Men	44	44.9
	b) Female	55	55.1

Based on the table above, it can be seen that most of the respondents in this study were under 30 years old (42.9%), and the least were over 40 years old (17.3%). Based on gender, most of the respondents in this study (81.6%) were female, and the remainder were male (18.4%). In terms of educational level, most of these respondents were secondary education graduates (63.3%), and the least were primary education graduates (15.3%). Apart from that, in terms of work, most of the respondents were housewives (45.9%), and the rest were self-employed (9.2%). Judging from another aspect of the respondents, namely the toddler age category, the majority were aged 24 - 35 months (21.4%) and the least were aged 36 - 47 months (16.3%). Based on the gender of the toddlers, in this study the majority (55.1%) were female and the remainder (44.9%) were male.

Univariate Analysis

Univariate analysis is an analysis of each variable which includes the incidence of diarrhea, clean water facilities, latrine facilities, waste management and waste water disposal channels.

Diarrhea Occurrence

The incidence of diarrhea is presented in table 2 below.

Table 2. Incidence of Diarrhea in Toddlers in the UPTD Working Area of the Gunungsitoli Idanoi Health Center in 2024

No	Diarrhea Occurrence	Number of toddlers (people)	Percentage (%)
1	Diarrhea	34	34.7
2	No diarrhea	64	65.3
	Amount	98	100.0

Based on the table above, it can be seen that the majority (65.3%) of diarrhea incidents in the UPTD area of the Gunungsitoli Idanoi Health Center were non-diarrhea and the remainder (34.7%) were diarrhea.

Clean Water Facilities

Clean water facilities are presented in table 3 below.

Table 3. Categories of Clean Water Facilities in the UPTD Working Area of the Gunungsitoli Idanoi Health Center in 2024

No	Clean Water Facilities	Number (org)	Percentage (%)
1	Not eligible	46	46.9
2	Qualify	52	53.1
	Amount	98	100.0

Based on the table above, it can be seen that the majority (53.1%) of the clean water facilities in the UPTD work area of the Gunungsitoli Idanoi Health Center meet the requirements and the remainder (46.9%) do not meet the requirements.

Toilet Facilities

An overview of latrine facilities in the UPTD work area of the Gunungsitoli Idanoi District Health Center can be seen in table 4.

Table 4. Categories of Toilet Facilities in the UPTD Working Area of the Gunungsitoli Idanoi Health Center

No	Toilet Facilities	Number (org)	Percentage (%)
1	Not eligible	72	73.5
2	Qualify	26	26.5
	Amount	98	100.0

Based on the table above, it can be seen that the majority (73.5%) of the latrine facilities at the UPTD of the Gunungsitoli Idanoi Health Center do not meet the requirements, the remainder (26.5%) meet the requirements.

Waste management

Waste management category resultsin the UPTD work area of the Gunungsitoli Idanoi District Health Center can be seen in table 5.

Table 5. Waste management categories in the UPTD area of the Gunungsitoli Idanoi Health Center

No	Waste management	Number (org)	Percentage (%)
1	Not eligible	20	20.4
2	Qualify	78	79.6
3	Amount	98	100.0

Based on the table above, it can be seen that the majority (79.6%) of waste management in the UPTD work area of the Gunungsitoli Idanoi Health Center meets the requirements and the remainder (20.4%) does not meet the requirements.

Wastewater Sewerage Management

Results of the wastewater drainage management category in the UPTD Puskesmas working area Gunungsitoli Idanoi District can be seen in table 6.

Table 6. Categories of wastewater drainage management in the UPTD area of the Gunungsitoli Idanoi Health Center

No	Water Channel Management Waste	Number (org)	Percentage (%)
1	Not eligible	45	45.9
2	Qualify	53	54.1
	Amount	98	100.0

Based on the table above, it can be seen that the majority (54.1%) of waste water drainage management in the UPTD work area of the Gunungsitoli Idanoi Health Center meets the requirements, and the remainder (45.9%) does not meet the requirements.

Bivariate Analysis

Analysis bivariate analyzes the relationship between clean water facilities, latrine facilities, waste management and waste water disposal channels with the incidence of diarrhea.

Relationship between Clean Water Facilities and Diarrhea Incidence

The results of data processing on the relationship between clean water facilities and the incidence of diarrhea are presented in table 7.

Table 7. Relationship between Clean Water Facilities and Diarrhea Incidence in the UPTD Working Area of Gunungsitoli Idanoi Health Center

		Occurrence of diarrhea						p value
		Diarrhea		No diarrhea		amount		
		n	%	n	%	n	%	
Clean water facilities	Not eligible	27	79.4	18	29.7	46	46.9	0.00
	Qualify	7	20.6	45	70.3	52	53.1	
	amount	34	100.0	64	100.0	98	100.0	

Based on the table above, it can be seen that of the 46 respondents who had clean water facilities, the majority (79.4%) did not meet the requirements. Apart from that, of the 52 respondents who had clean water facilities that met the requirements, most (70.3%) of the diarrhea incidents were not diarrhea, and (20.6%) were diarrhea. Furthermore, based on the results of statistical tests, a p value of 0.00 ($p<0.05$) was obtained. So it can be concluded that there is a relationship between clean water facilities and the incidence of diarrhea in the UPTD work area of the Gunungsitoli Idanoi Health Center.

The results of this research show that there is a relationship between the availability of clean water facilities and the incidence of diarrhea in toddlers in the UPTD work area Gunungsitoli Idanoi District Health Center. These results are in line with research by Bangun et al. (2020) in Durian Village, Pantai Labu District, Deli Serdang, which proves that there is a relationship between the availability of water facilities that do not meet the requirements and the incidence of diarrhea in the village with p-value = 0.009. The results of this research are also in line with research by Sari et al., (2023) which states that from the results of the chi-square test, the result was p-value = 0.002 (p<0.01), which means there is a relationship between the availability of clean water and the incidence of diarrhea. in toddlers.

Providing clean water is one of the efforts to improve the level of public health as explained in Law Number 17 of 2023 concerning Health, it is explained that environmental health is implemented to create a healthy environment, namely a condition that is free from risks that endanger human health.

Clean water facilities are one of the sanitation facilities that is no less important in relation to the incidence of diarrhea. The unavailability of clean water sources can be a factor in the incidence of diarrhea. The effect of clean water on health depends greatly on the quality of the water and occurs because water functions as a distributor or spreader of disease causes, and as a nest for disease insects.

Relationship between Toilet Facilities and Diarrhea Incidence

The results of data processing on the relationship between latrine facilities and the incidence of diarrhea are presented in table 8.

Table 8. Relationship between latrine facilities and the incidence of diarrhea in the UPTD work area of the Gunungsitoli Idanoi Health Center

		Occurrence of diarrhea						p value
		Diarrhea		No diarrhea		amount		
		n	%	n	%	n	%	
Toilet Facilities	Not eligible	33	97.1	39	60.9	72	73.5	0.00
	Qualify	1	2.9	25	39.1	26	26.5	
	amount	34	100.0	64	100.0	98	100.0	

Based on the table above, it can be seen that most of the 72 respondents whose toilet facilities (97.1%) did not meet the requirements. In addition, of the 26 respondents who had latrine facilities that met the requirements, the majority (39.1%) of the diarrhea incidents were no diarrhea, and (2.9%) had diarrhea. Furthermore, based on the results of statistical tests, a p value of 0.00 (p<0.05) was obtained. So it

can be concluded that there is a relationship between latrine facilities and the incidence of diarrhea in the UPTD work area of the Gunungsitoli Idanoi Health Center.

The results of this research show that there is a relationship between the availability of toilet facilities and the incidence of diarrhea in toddlers in the UPTD work area of the Gunungsitoli Idanoi District Health Center. The results of this research are also in line with research (Ishak, 2019) latrine ownership on the incidence of diarrhea among toddlers in Banjarmasin City, which states that there is a significant relationship between latrine ownership (p-value=0.038) and latrine conditions (p-value=0.000) on the incidence of diarrhea among toddlers in Banjarmasin City. This research is also in line with research by Agus Tuang (2021) showing that one of the factors that can cause diarrhea is owning a latrine.

Table 8. Relationship between Waste Management and Diarrhea Incidence in the UPTD Working Area of Gunungsitoli Idanoi Health Center

		Occurrence of diarrhea						p value
		Diarrhea		No diarrhea		amount		
		n	%	n	%	n	%	
Management rubbish	Not eligible	17	50.0	3	4.7	20	100.0	0.00
	Qualify	17	50.0	61	95.3	78	100.0	
	amount	34	100.0	64	100.0	98	100.0	

Based on the table above, it can be seen that most of the 20 respondents whose waste management (50.0%) did not meet the requirements. In addition, of the 78 respondents who had waste management that met the requirements, the majority (95.3%) of diarrhea incidents were non-diarrhea, and (50.0%) were diarrhea. Furthermore, based on the results of statistical tests, a p value of 0.00 (p<0.05) was obtained. So it can be concluded that there is a relationship between waste management and the incidence of diarrhea in the UPTD work area of the Gunungsitoli Idanoi Health Center.

Waste management is the remainder of daily human activities or natural processes in solid form which is reprocessed into useful items. Specific waste is waste that, due to its nature, concentration or volume, requires special management. Waste management is a comprehensive, sustainable activity, which includes reducing and handling waste as well as handling waste (Abidin, 2021).

The results of this research show that there is a relationship between waste management and the incidence of diarrhea

in toddlers in the UPTD work area of the Gunungsitoli Idanoi District Health Center. These results are in line with research by Putra et al., (2022) regarding the implementation of household waste and wastewater management and the incidence of diarrhea in Kaliawi Persada Village, Bandar Lampung City, stating that there is a significant relationship between waste management and the incidence of diarrhea with (p-value =0.006). The results of this research are also in line with Tuang's research, (2021), analysis of factors related to the incidence of diarrhea in children shows that there is a relationship between management andwaste (p-value=0.003) on the incidence of diarrhea.

If waste is not managed properly, chemicals can pollute water and soil, which has a negative impact on human health and can increase the risk of diarrhea. Therefore, good waste management and a clean environment are important and main steps in reducing the risk of diarrhea. along with other diseases.

Relationship between wastewater management channels and diarrhea incidence

Results of data processing on the relationship between waste water management channels and eventsian diarrhea served on ta

Table 9. Relationship between wastewater drainage management and diarrhea incidence in the UPTD work area of the Gunungsitoli Idanoi Health Center

		Occurrence of diarrhea						p value
		Diarrhea		No diarrhea		amount		
		n	%	n	%	n	%	
Management Channel Disposal Wastewater	Not eligible	28	82.4	17	26.6	45	45.9	0.00
	Qualify	6	17.6	47	73.4	53	54.1	
	amount	34	100.0	64	100.0	98	100.0	

Based on the table above, it can be seen that of the 45 respondents whose wastewater drainage management, the majority (82.4%) did not meet the requirements. In addition, of the 53 respondents who had wastewater drainage management that met the requirements, the majority (73.4%) of diarrhea incidents were no diarrhea, and (17.6%) had diarrhea. Furthermore, based on the results of statistical tests, a p value of 0.00 ($p<0.05$) was obtained. So it can be concluded that there is a relationship between wastewater drainage management and the incidence of diarrhea in the UPTD work area of the Gunungsitoli Idanoi Health Center.

The results of this research show that there is a relationship between waste management and the incidence of diarrhea

in toddlers in the UPTD work area of the Gunungsitoli Idanoi District Health Center. This research is in line with research by Endawati et al., (2021).

The relationship between basic sanitation and the incidence of diarrhea in toddlers in the working area of the Palembang City Community Health Center with research results showing that there is a significant relationship between the condition of SPAL (p-value=0.000) and the incidence of diarrhea. The results of this research are also in line with research by Dina Aolina, (2020) on the development of Indonesian public health which examined the relationship between environmental factors and the incidence of diarrhea in the community which stated that there was a relationship between SPAL management and the incidence of diarrhea (p-value=0.024).

Houses where wastewater is dumped on open ground without a waste disposal channel will make the environment dirty, muddy and cause unpleasant odors and can become a breeding ground for insects or parasites, especially mosquitoes, and cause diarrhea due to the surrounding environment. the respondent's house had been polluted.

CONCLUSION

All the variables studied are related to the incidence of diarrhea, so it is necessary to make various efforts through the role of the community and health workers in improving the quality of a healthy environment which is related to the incidence of diarrhea in the working area of the UPTD Puskesmas Gunungsitoli Idanoi District.

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