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The Prevalence of Diarrhea Based on Knowledge and Environmental Sanitation in Tanjung Lago Village Wetland Area

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Abstract. UNICEF in 2013 reported more than 400 children die everyday. The prevalence of diarrhea occurs more in developing countries. Children under the age of five experience an average of 1.6 to 2.3 episodes of diarrhea per year. The aim of the study was to determine the prevalence of diarrhea based on knowledge and environmental sanitation in Tanjung Lago wetland area. This study used cross sectional design with quantitative approach. The sampling technique was simple random sampling with mapping. The sample was 145 housewives with children under five. It used univariate and bivariate analysis. The prevalence of diarrhea in Tanjung Lago was 13.8%. Only a portion of the respondents knew what diarrhea was (53.1%) and the cause of diarrhea (53.8%). The majority of respondents used river water as a source of clean water (91.0%) and refill water as a source of drinking water (98.6%). Most of respondents who have latrines were only less than 10m from daily sources of clean water (91.7%). There is no relationship between knowledge. quality of clean water and availability of latrines with the incidence of diarrhea on children under five. It is important to communicate. inform and educate the public about the environment that can be a medium for diarrhea transmission and the quality of clean water.

1 Introduction

Health development is an integral part of national development with important role in determining success in achieving national development goals[1]. Health is a human right and becomes an element of prosperity that must be realized in accordance with the ideals of the Indonesian people as intended in Pancasila and the Constitution of the Republic of Indonesia 1945[2.3].

Based on UNICEF report on September 13. 2013. around 150.000 Indonesian children died in 2012 and every day in Indonesia more than 400 children die. The majority of these

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children are from poor and marginalized families. They become victims of diarrhea. a disease that supposed to be easily treated and prevented[4].

The incidence of diarrhea is still a major health problem for under five-year-old children. especially in developing countries such as Indonesia. If diarrhea is not treated further most of the time. it will cause dehydration which results in death. The prevalence of diarrhea occurs more in developing countries than in developed ones. Children under the age of five in developing countries experience an average of 1.6 to 2.3 diarrhea episodes per year[5].

One of the Millennium Development Goals (MDG's) programs is to reduce under-five mortality by two-thirds between 1990 and 2015. In 1990. the number of under-five deaths was 97 deaths per 1.000 live births so that the target in 2015 was 32 deaths per 1.000 live births. In 2007 the under-five mortality rate in Indonesia was 44 cases. meaning that Indonesia was quite successful. However. this success must remain a concern because diarrhea has so far been a public health problem and often arises in the form of outbreak with high mortality rates. especially in Eastern Indonesia. In 2008 an outbreak occurred in 69 districts with a total of 8133 cases. 239 deaths (CFR 2.94%). In 2009 an outbreak occurred in 24 sub-districts with 5.756 cases. with 100 deaths (CFR 1.74%). whereas in 2010 there were outbreaks of diarrhea in 33 sub-districts with 4204 patients with 73 deaths (CFR 1.74%)[6].

The increasing incidence of environment-based diseases such as diarrhea must be prevented to increase health of communities. The availability of basic sanitation facilities is very necessary. The emergence of diarrheal disease can be influenced by several factors including nutritional. socio-economic and socio-cultural status. population density and other interrelated factors[7].

Environmental health is part of the fundamentals of modern public health which includes all aspects of human beings in relation to the environment. which is bound to various ecosystems. The scope of environmental health includes water sources. cleanliness of latrines. garbage disposal. housing conditions. waste water management. Environment is anything that surrounds conditions outside of humans or animals that cause disease transmission[8].

Water used by the community for daily needs must meet the requirements. The Government of Indonesia through Permenkes No. 416/MENKES/PER/IX/1990 has set a standard for clean water. which in general includes physical conditions such as color. odor. taste and turbidity; bacteriological conditions include parasitic germs. pathogenic germs and Coli class bacteria; chemical requirements including in water may not contain substances that provide health problems. do not contain toxic chemical elements. do not contain substances whose levels exceed certain limits so that they can cause technical problems [9].

Children's diet nowadays requires a lot of supervision from parents. for example street snacking habits. Snacks now. especially in the middle to lower class communities. still far from the requirements as stated in Permenkes RI/942/SK/VII/2003 concerning hygiene and sanitation requirements. Prevention and eradication of diarrhea is closely related to personal and environmental sanitation that must be more improved. Public sanitation is closely related to the level of knowledge and behavior that each individual has in doing daily activities[10].

Previous study in Jemowo Village found that there were still 16.59% children experienced diarrhea and based on interviews to mothers who have children aged 1-5. regarding the knowledge of diarrhea prevention and management of diarrhea. 25% mothers understood and carried out appropriate management when their child experienced diarrhea while the rest did not know and did not carry out. The number of cases of child deaths due

to easily preventable causes of diarrhea was because lack of proper knowledge and practice.[11]

2 Materials and Methods

The design of this study was cross sectional using primary data. The approach used was quantitative. The sample of this study was housewives who have children under five years old. Sample size of the study was 145 people. The sampling technique used was simple random sampling with mapping. The data analysis used were univariate analysis aimed to determine the prevalence of diarrhea. the description of the characteristics of respondents. and the factors that led to the incidence of diarrhea. while bivariate analysis aimed to determine the relationship between knowledge about diarrhea and environmental sanitation on the incidence of diarrhea. Statistical test used in this study was chi square test.

3 Results and Discussions

Table 1. Description of Characteristics of Respondents

Variables	Number (N)	Percentage (%)
Education		
1. Not schooling/Not graduated	54	37.2
2. Elementary School	58	40.0
3. Junior High School	16	11.0
4. Senior High School	15	10.3
5. Diploma/ Bachelor	2	1.4
Job		
Unemployed	132	91.0
Enterpreneur	1	0.7
Others	12	8.3
Diarrhea		
Yes	20	13.8
No	125	86.2
	Median	**Min – max**
Number of family member	4	3 – 11

The majority of respondents were elementary school graduates (40.0%). Based on job. the results showed that the majority of respondents were unemployed (91.0%). A total of 50 respondents had fewer than 4 family members and 50% of respondents had more than 4 family members (Table 1).

Tabel 2. Description of Respondents' Knowledge about Diarrhea

No.	Questions	Number (n=145)	Percentage (%)
1.	Does the mother know what diarrhea means (yes.n.%)	77	53.1
2.	Does the mother know about Oral Rehydration Salts/ORS (yes.n.%)	84	57.9
3.	Does the mother know about salt sugar solution (yes.n.%)	82	56.6
4.	When is the time for mother to seek health care assistance when children are diarrhea (soon.n.%)	145	100
5.	Does the mother know the cause of diarrhea (yes.n.%)	73	53.8

The majority of respondents knew about diarrhea (53.3%). ORS (57.9%). salt sugar solution (56.6%). knew the right time to seek health care assistance when children were having diarrhea (100 %). and knew the cause of diarrhea (53.8%) (Table 2).

Tabel 3. Description of Environmental Sanitation

No.	Questions	Number (n=145)	Pecentage (%)
	Water Source Quality		
	Is the condition of water consumed in color (yes.n.%)	7	4.8
	Is the condition of the water consumed tasty (yes.n.%)	2	1.4
	Is the condition of the water consumed smells (yes.n.%)	2	1.4
	Clean Water Source		
	Dug well	11	7.6
	river/lake/swamp	132	91.0
	Refill water	2	1.4
	Drinking Water Source		
	Dug well	2	1.4
	Refill water	143	98.6
	Availability of latrines (yes.n.%)	143	98.6
	Latrine distance with drinking water sources		
	< 10 m	133	91.7
	10 -12 m	9	6.2
	>12 m	3	2.1

The results showed that the majority of water used was colorless (4.8%). a source of clean water which was a river (91.0%). the water source which was refill water (98.6%). Based on vertical latrine. it was obtained from respondents who had latrines (98.6%) and the distance of latrines from water source was mostly less than 10 m (91.7%) (Table 3).

Table 4. The Relationship between Knowledge and Environmental Sanitation with The Incidence of Diarrhea in Infants

Variables	Incindence of Diarrhea		Prevalence Ratio	95% Confidence Interval	P Value (sig)
	Yes n (%)	No n (%)			
Knowledge Bad Good	6 (9.4) 14 (17.3)	58 (90.6) 67 (82.7)	0.542	0.221-1.332	0.259
Clean Water Quality Not eligible Eligible	0 (0) 20 (13.9)	1 (100) 124 (86.1)	-	-	1.000
Ketersediaan jamban Unavailable Available	1 (50) 19 (13.3)	1 (50) 124 (86.7)	3.763	0.885-16.007	0.643

The incidence of diarrhea was most happened among respondents who had good knowledge of 17.3% while those who had bad knowledge were 9.4%. Based on the quality of clean water. almost all respondents had clean water quality that met the requirements. 13.3% of them experienced diarrhea. The incidence of diarrhea in respondents who did not have latrines was 50% while those who had latrines were 13.3%.

Respondents who did not have latrines were at 3.763 times more likely to experience diarrhea than respondents who had latrines (PR: 3.763. 95% CI: 0.885-16.0007). The results of the analysis in Table 5 showed that there was no statistically significant relationship between the level of knowledge and the incidence of diarrhea in the

respondents (p value> 0.05). In addition. it was also known that there was no statistically significant relationship between the quality of clean water and the availability of latrines with the incidence of diarrhea (p value> 0.05).

Some of the respondents knew what diarrhea was (Table 1). The incidence of diarrhea in a community is an indicator of the state of health status in a community that is related to the implementation of the health system at the level of people who do not meet health requirements[2]. This study showed that almost one fifth of the respondents who had good knowledge experienced the incidence of diarrhea (Table 2). Knowledge of diarrhea is the ability of a person to know and understand the management of diarrhea at home which is obtained from a number of questions regarding the understanding of diarrhea. the cause of diarrhea. the effects of diarrhea and prevention of diarrhea and treatment. Behaviors can also affect one's own health. Healthy behavior related to diarrhea includes: maintaining hand hygiene. maintaining the cleanliness of eating utensils. maintaining food hygiene. and maintaining cleanliness of the latrine. Environmental health care behavior. one of which includes behavior towards the presence of garbage in the vicinity of the environment[12].

This study showed that there was no statistically significant relationship between knowledge and incidence of diarrhea. Only a portion of respondents knew what causes diarrhea (Table 1). This results in a mother being unable to prevent her child from experiencing diarrhea. But all respondents knew when the time was right for them to seek help when their children had diarrhea. The majority of respondents knew what ORS or salt sugar solution was (Table 1). This had led to a higher incidence of diarrhea in respondents with good knowledge because respondents only knew what they had to do when their children experienced diarrhea but were unable to prevent diarrhea.

The result of this study was not in line with previous study which there was a statistically significant relationship between the factors of knowledge of mothers with the incidence of diarrhea.[6] Out of 49 respondents who were knowledge able. 67.35% children were not affected by diarrhea. This study is also not in line with the results of research in Jemowo village which showed that there was a relationship between maternal knowledge about diarrhea control against diarrhea management in children aged 1-5 (p-value 0.000)[11].

With a low level of knowledge about diarrhea. a mother tends to have difficulty protecting and preventing her child from getting diarrhea. This low knowledge causes people to have their own and different views on diarrheal diseases. Also. low knowledge of breast milk and colostrum causes the mother to often discard breast milk and colostrum because they are considered not useful[11].

One of the factors that influence the occurrence of diarrheal diseases is the state of basic sanitation in the home environment that does not meet health requirements (clean water facilities. latrine ownership. sewerage. waste treatment systems). poor utilization and maintenance of environmental health facilities and less hygienic living behavior. The problem of human waste disposal is a major problem. so it needs to be addressed as early as possible because human faeces are the source of the spread of disease. The spread of diseases that originate in human waste can be through various ways such as water. hands. insects and soil. Efforts to improve environmental sanitation through the use of latrines that meet health requirements can reduce the incidence of diarrhea[7]. Almost all respondents had clean water quality that meets the requirements. However. the results of this study indicate that the incidence of diarrhea is most prevalent in respondents with clean water quality that meets the requirements (13.9%) (Table 5

Based on the results of the analysis. there was no relationship between the quality of clean water and the availability of latrines with the incidence of diarrhea. This is not in line with previous research where there was a significant relationship between the supply (source) of clean water owned by respondents with the incidence of diarrhea in under-five

respondents (p value = 0.002). children from respondents who have clean water supply who do not meet the risk requirements 2.47 times suffering from diarrhea compared to children from respondents who have clean water supply that meets physical requirements.

In this study. the quality of clean water that meets the requirements is only seen based on physical conditions without seeing the bacteriological conditions of the water. The cause of diarrhea still presents in clean water that does not meet the requirements bateriologically. Almost all respondents use river. lake or swamp water as a source daily clean water. This is also supported by the availability of latrines where the majority of respondents who have latrines which are only less than 10m from the sources of clean water that are used daily. So that diarrhea-causing bacteria can contaminate the source of clean water used by respondents.

The requirements for clean water facilities. in this case are dug wells. are in terms of location and construction. The location requirements of dug wells are. among others. having a minimum distance of 11 meters from bacteriological pollutant sources. in areas that are sloping the location of the dug well must be above the pollutant source. located in a layer of soil containing water throughout the season. and attempted to be located in a flood-free area[7]

4 Conclusions

There was no relationship between knowledge and environmental sanitation on the incidence of diarrhea in the wetland area of Tanjung Lago village. Communication. information and education to the public regarding the environment that can be a medium for transmission of diarrhea and the quality of clean water that meets the requirements according to Permenkes No. 416 / MENKES / PER / IX / 1990 is important. Further research with laboratory tests is needed in order to find out the quality of clean water from not only physical aspects but also bacteriological and chemical aspects.

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