

THE RELATIONSHIP BETWEEN ENVIRONMENTAL SANITATION AND THE INCIDENCE OF DIARRHEA IN TODDLERS

Kriswanto, Siti Musyarofah*, Mushidah

Sekolah Tinggi Ilmu Kesehatan Kendal, Jln Laut 31 Kendal, Central Java 51311, Indonesia

*sitimusyarofah24@gmail.com

ABSTRACT

Diarrhea is defecation three or more times in one day with a liquid consistency which is one of the infectious diseases that causes death in infants and toddlers, at the Rowosari II Health Center is one of the areas where the number of diarrhea sufferers has increased from 2018-2020. that is as many as 115 people to 125 people. Factors that influence the incidence of diarrhea in toddlers include clean water sources, latrine ownership facilities, and the type of floor. This study aims to determine the relationship between environmental sanitation and the incidence of diarrhea in children under five in the Rowosari II health center. This type of analytic observational research with a cross-sectional approach, with a questionnaire measuring instrument, processed by univariate and bivariate tests, and chi-square test, if it does not meet the requirements then the fishers exact test. The results of the study on 40 respondents who were the patient population of Rowosari II Health Center, it was found that there was a relationship between clean water sources (Pvalue = 0.029) with the incidence of diarrhea in children under five at Rowosari II Health Center during the last six months, and there was no relationship between latrine ownership facilities (Pvalue). = 1.00) and the type of floor (Pvalue = 0.746) (Odds Ratio 95% CI = 1.160 (0.475–2.830) with the incidence of diarrhea in children under five at the Rowosari II Health Center during the last six months. Parents of children under five are expected to better maintain the hygiene conditions of toddlers as well as the environment and related agencies in order to improve health promotion regarding clean, healthy living behavior and using water sources from PAMSIMAS.

Keywords: environmental sanitation; incidence of diarrhea in toddlers; toddlers

INTRODUCTION

Diarrhea is one of the infectious diseases that causes death in infants and children under five (Kemenkes RI, 2015). Diarrhea is defecation three or more times in one day with a liquid consistency (Brandt, et al, 2015). According to data from the World Health Organization (WHO) in 2015, the mortality rate due to diarrhea in children under five in Nigeria and India was 42% and the morbidity rate for children under five with diarrhea was 39%. According to WHO, diarrheal disease is the second leading cause of death in children under five years of age, and is responsible for killing around 525,000 children every year. Diarrheal disease is the leading cause of child mortality and morbidity in the world, and is largely the result of contaminated food and water sources. Worldwide, 780 million people do not have access to better drinking water and 2.5 billion do not have better sanitation. Diarrhea due to infection is widespread in all developing countries (WHO, 2017). The majority of these deaths 15% were caused by pneumonia followed by diarrhea as much as 9% (UNICEF, 2016). Estimated child mortality due to diarrhea in Nigeria is around 151, 700–175,000 per year (Dairo in Omele, 2019).

In Indonesia, according to the Ministry of Health of the Republic of Indonesia 2018, diarrheal disease is an endemic disease and is also a serious disease. Potential Extraordinary Events (KLB) accompanied by death. In 2018 there were 10 outbreaks spread across 8 provinces, 8 districts/cities with 756 sufferers and 36 deaths (CFR 4.76%). The mortality rate (CFR) is

expected to be 1%), while in 2018 the CFR for diarrhea has increased compared to 2017 which is 4.76%.

Five provinces in Indonesia are still quite high in the incidence (prevalence) of diarrhea in all age groups reaching 7 percent. The five provinces include Papua, South Sulawesi, Aceh, West Sulawesi, and Central Sulawesi. The incidence of diarrhea in the age group of children under five in Indonesia is 10.2 percent. The five provinces with the highest incidence of diarrhea in children under five are Aceh, Papua, DKI Jakarta, South Sulawesi, and Banten. (Lidiawati, 2017). Based on the diarrhea morbidity survey in 2014 the incidence of diarrhea in children under five was 27%, and in 2016 it was estimated that the number of sufferers was 46.4% (Ministry of Health of the Republic of Indonesia, 2016). The SDGs target in 2030 is to end infant and under-five mortality by reducing the infant mortality rate by 12/1000 live births and the mortality rate for children under five years old by 25/1000 live births (Kemenkes RI, 2015). According to the results of the 2013 Riskesdas, the incidence of diarrheal disease in children under five is 10.2%, the CFR of Extraordinary Events (KLB) of diarrhea in Indonesia in 2011 was 0.29%, increased to 2.06% in 2012 and then decreased in 2013 to 316 1.08%.

Rowosari II Health Center is one of the areas where the number of diarrhea sufferers has increased from 2018-2020, from 115 people to 125 people. Based on data from the Rowosari II Health Center, the number of diarrhea sufferers in toddlers in 2018 was 115 toddlers, in 2019 there were 109 toddlers, while in 2020 there were 125 toddlers from the total number of toddlers in the Rowosari II Health Center area as many as 1,389 toddlers. Based on the description above, the researcher is interested in conducting research on the relationship between environmental sanitation and the incidence of diarrhea in toddlers in the work area of the Rowosari II Health Center in 2020.

METHOD

This research is a descriptive analytic study with a cross sectional approach where the cause (independent variable) or risk and effect (dependent variable) variables or cases that occur in the research object are measured or collected simultaneously (at the same time). The population in this study were visitors to the Rowosari II Health Center in 2020, a total of 129 visitors, with a random sample of 40 visitors.

RESULTS

Table 1, namely for the age grouping category of respondents who are or have experienced diarrheal disease during the last six months in the Rowosari II Health Center area in 2020 the most are > 1-3 years old, namely 19 respondents (47.5%), and for the category of type classification The gender of respondents who are or have experienced diarrheal disease during the last six months in the Rowosari II Health Center Region in 2020 the number of women is more, namely 22 respondents (55%).

Table 1.

Table of Respondents Characteristics of Toddler Patients in the Rowosari II Community Health Center who are currently or have experienced diarrhea in the last six months of 2020

Variable	f	%
Age		
0 - 1 year	16	40
> 1 – 3 year	19	47,5
> 3 – 5 year	5	12,5
Sex		
Man	18	45
Woman	22	55

Table 2.

Distribution of the frequency of occurrence of children under five who are or have experienced diarrhea in the last six months in the Rowosari II Health Center area

Dhiarrhea in Toddler	f	%
Dhiarrhea	13	32,5
No Dhiarrhea	27	67,5

Table 3.

Frequency Distribution of Clean Water Sources at Homes for Toddlers Who Are Or Have Experienced Diarrhea During the Last Six Months

Clean water sources	f	%
Protected	3	7,5
Not Protected	37	92,5

Table 3, namely for the category of clean water source facilities in the homes of toddlers who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020, only 3 respondent homes have protected clean water sources (7.5%) while clean water sources more than 40 (92.5%).

Table 4.

Frequency Distribution of Toilet Ownership Facilities at Homes for Toddlers Who are or Have Experienced Diarrhea During the Last Six Months

Toilet ownership facilities	f	%
Have	39	97,5
Didn't have	1	2,5

Table 4, namely for the category of latrine ownership facilities in the homes of toddlers who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020 there are 39 respondent houses that have latrines (97.5%) while there is only 1 respondent's house that does not. owns a latrine (2.5%).

Table 5.
Frequency Distribution of Floor Types in Toddler Houses Who Are Or Have Experienced Diarrhea During The Last Six Months

Floor type	f	%
Waterproof	17	42,5
Not waterproof	23	57,5
Total	40	100

Table 5, namely for the category of floor types in children's homes who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020 there are 17 respondent houses that have waterproof floors (97.5%) while the types of floors are not waterproof. there are 23 (57.5%).

Table 6.
The Relationship between Clean Water Sources and Diarrhea in Toddlers During the Last Six Months

Clean water source	The Incidence of Diarrhea in Toddlers		Total	P value	POR (95% CI)	
	Dhiarrhea	No Dhiarrhea				
Didn't Protected	10 (27,0%)	27 (37,0 %)	37(100 %)	0,029	0,270	(0,159-0,459)
Protected	3 (100 %)	0 (0,0 %)	3 (100%)			

Table 6, it can be seen that the incidence of children under five who do not have diarrhea who have a clean water source is not protected more, namely 27 respondents (37.0%) compared to the incidence in children under five who do not have diarrhea who have a protected source of clean water, which is 0. respondents (0.0%). Based on the results of data analysis, because the chi square test did not meet the requirements, using the Fisher test, it was obtained a P value of 0.029 (P value <0.05) meaning that there was a statistically significant relationship between the incidence of diarrheal disease in children under five during the last six months in the region. Rowosari II Health Center in 2020 with clean water sources in every house. The value of Odds Ratio (OR) = 0.270 with a value of 95% Convidence Interval (CI) which gives a lower limit = 0.159 and an upper limit = 0.459 indicates that unprotected clean water sources have a risk of causing diarrheal diseases in children under five in the Puskesmas area. Rowosari II in 2020 with the lowest risk of 0.159 and the highest risk of 0.459 where unprotected clean water sources have a 0.029 times greater risk of experiencing diarrheal disease in children under five in the Rowosari II Health Center area in 2020 compared to protected clean water sources every year. under-five children's homes in the Rowosari II Health Center area in 2020. The influence of clean water sources on the incidence of diarrheal disease in toddlers is due to the unprotected clean water source in each house causing or will become a nesting place for various bacteria that are very dangerous for digestion and infection. influence on the incidence of diarrheal disease in toddlers in the Rowosari II Health Center area in 2020.

Table 7.
The Relationship of Latrine Ownership Facilities with Diarrhea in Toddlers During the Last Six Months

Toilet ownership facilities	The Incidence of Diarrhea in Toddlers		Total	P value	POR (95% CI)
	Dhiarrhea	No Dhiarrhea			
Didn't Have	0 (0,0 %)	1 (100 %)	1 (100 %)	1,00	1,500 (1,201-1,873)
Have	13 (33,3 %)	26 (66,7 %)	39 (100 %)		

Table.7, it can be seen that the incidence of diarrheal disease that is not experienced by toddlers by having more latrine ownership facilities is 26 respondents (66.7%). Based on the results of data analysis, because the chi square test did not meet the requirements, using the Fisher test, it was obtained a P value of 1.00 (P value > 0.05) meaning that there was no statistically significant relationship between the incidence of diarrheal disease in children under five for six months. Finally, in the Rowosari II Health Center area in 2020 with latrine ownership facilities, because most of them already have their own latrine ownership, there is only 1 respondent (100%) who does not have their own latrine ownership.

Table 8.
The Relationship between Floor Type and Diarrhea in Toddlers During the Last Six Months

type of floor	The Incidence of Diarrhea in Toddlers		The Incidence of Diarrhea in Toddlers	P value	POR (95% CI)
	Dhiarrhea	Dhiarrhea			
Not Waterproof	7 (30,4 %)	16 (69,6 %)	23 (100 %)	0,746	1,075 (0,690-1,674)
Waterproof	6 (35,3 %)	11 (64,7 %)	17 (100 %)		

Table 8, it can be seen that diarrheal diseases that were not experienced by toddlers during the last six months in the Rowosari II Health Center area in 2020 with ownership of non-impermeable floors were 16 respondents (69.6%) compared to diarrheal diseases not experienced by toddlers. with ownership of the type of waterproof floor that is 11 respondents (64.7 %). Based on the results of data analysis using the chi square test, a P value of 0.746 (p value > 0.05) was obtained, meaning that statistically there was no significant relationship between the type of floor and the incidence of diarrheal disease in children under five during the last six months in the Rowosari II Health Center area in 2020. .

DISCUSSION

The incidence of diarrheal disease in toddlers during the last six months From the results of the study, it can be seen that for the category of incidence of toddlers who are or have experienced diarrhea during the last six months in the Rowosari II Health Center area as many as 13 respondents (32.5%) experienced diarrhea, and 27 respondents (67.5%) did not experience diarrhea. diarrhea incidence.

Several factors can influence the occurrence of diarrheal disease in toddlers, including: Educational Factors, Nutritional Factors, Community Behavior Factors, Environmental Circumstances Factors.

Clean water source facilities in every home for toddlers who experience diarrheal disease From the results of the research conducted, it can be seen that for the category of clean water sources in the homes of toddlers who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020 only 3 respondent's houses have protected clean water sources (7.5%). while the facilities for clean water sources that are not protected are more, namely 40 (92.5%).

Facilities for ownership of latrines in every home of children under five who experience diarrheal disease From the results of the study, it can be seen that for the category of latrine ownership facilities in the homes of toddlers who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020 there are 39 respondent houses that have latrines (97.5%) while there is only 1 house. respondents who do not own a latrine (2.5%).

The type of floor in each house for toddlers who experience diarrheal disease. Based on the results of the study, it can be seen that for the category of floor types in children's homes who are or have experienced diarrhea during the last six months in the Rowosari II Health Center area in 2020 there are 17 respondent's houses that have a waterproof floor type (97.5%) while the type of floor is waterproof. not waterproof there are 23 (57.5%).

The relationship between clean water sources and the incidence of diarrhea in children under five during the last six months

The category of clean water source facilities in the homes of toddlers who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020 only 3 respondent's houses have protected clean water sources (7.5%) while clean water sources that are not protected are more namely a number of 40 (92.5%). Based on the results of data analysis, it can be seen that the incidence of toddlers who do not have diarrhea who have clean water sources that are not protected is more than 27 respondents (37.0%) compared to the incidence of toddlers who do not have diarrhea who have protected clean water sources, namely 0 respondents (0.0%). Based on the results of data analysis, because the chi square test did not meet the requirements, using the Fisher test, it was obtained a P value of 0.029 (P value <0.05) meaning that there was a statistically significant relationship between the incidence of diarrheal disease in children under five during the last six months in the region. Rowosari II Health Center in 2020 with clean water sources in every house. The value of Odds Ratio (OR) = 0.270 with a value of 95% Confidence Interval (CI) which gives a lower limit = 0.159 and an upper limit = 0.459 indicates that unprotected clean water sources have a risk of causing diarrheal diseases in children under five in the Puskesmas area.

Rowosari II in 2020 with the lowest risk of 0.159 and the highest risk of 0.459 where unprotected clean water sources have a 0.029 times greater risk of experiencing diarrheal disease in children under five in the Rowosari II Health Center area in 2020 compared to protected clean water sources every year. under-five children's homes in the Rowosari II Health Center area in 2020. The influence of clean water sources on the incidence of diarrheal disease in toddlers is due to the unprotected clean water source in each house causing or will become a nesting place for various

bacteria that are very dangerous for digestion and infection. influence on the incidence of diarrheal disease in toddlers in the Rowosari II Health Center area in 2020. To prevent diarrhea, clean water must be taken from protected/uncontaminated sources. Sources of clean water must be away from cattle pens and latrines at least ten meters from water sources. Water must be stored in a clean container and water intake in a container using a clean dipper, and for drinking water must be boiled. People who are reached by the provision of clean water are at a lower risk of suffering from diarrhea when compared to people who do not get clean water. This study is in accordance with Nurwinda's research (2019) on toddlers at the Bernung Health Center. Statistical test of the clean water source variable obtained the results of $p\text{-value} = 0.019 < 0.05$, which means that it is concluded that there is a relationship between the source of clean water used and the incidence of diarrhea in children under five at the Bernung Health Center, with an OR value of 4.035 which means that the source of clean water does not meet the requirements. conditions 4.035 times more at risk for diarrhea. And based on the contingency coefficient value = 0.198, so it can be concluded that there is a very low relationship between clean water sources and the incidence of diarrhea in toddlers.

The relationship between latrine ownership facilities and the incidence of diarrhea in children under five during the last six months in the work area of the Rowosari II Health Center in 2020. It can be seen that the category of latrine ownership facilities in the homes of toddlers who are or have experienced diarrhea for the last six months in the Rowosari II Health Center area in 2020 there are 39 respondent houses that have latrines (97.5%) while there is only 1 respondent's house that does not have ownership. latrine (2.5%). Based on the results of data analysis, it can be seen that the incidence of diarrheal disease that is not experienced by toddlers by having more latrine ownership facilities is 26 respondents (66.7%). Based on the results of data analysis, because the chi square test did not meet the requirements, using the Fisher test, it was obtained a P value of 1.00 ($P\text{ value} > 0.05$) meaning that there was no statistically significant relationship between the incidence of diarrheal disease in children under five for six months. Finally, in the Rowosari II Health Center area in 2020 with latrine ownership facilities, because most of them already have their own latrine ownership, there is only 1 respondent (100%) who does not have their own latrine ownership.

The relationship between the type of floor and the incidence of diarrhea in toddlers during the last six months in the work area of the Rowosari II Health Center in 2020. Based on the results of the study, it can be seen that for the category of floor types in children's homes who are or have experienced diarrhea during the last six months in the Rowosari II Health Center area in 2020 there are 17 respondent's houses that have a waterproof floor type (97.5%) while the type of floor is waterproof. not waterproof there are 23 (57.5%). Based on the results of data analysis, it can be seen that diarrheal diseases that were not experienced by toddlers during the last six months in the Rowosari II Health Center area in 2020 with the ownership of non-impermeable floor types were 16 respondents (69.6%) compared to diarrheal diseases that were not experienced. under five with the ownership of the type of waterproof floor that is 11 respondents (64.7 %). Based on the results of data analysis using the chi square test, a P value of 0.746 ($p\text{ value} > 0.05$) was obtained, meaning that statistically there was no significant relationship between the type of floor and the incidence of diarrheal disease in children under five during the last six months in the Rowosari II Health Center area in 2020. This incident can be related to washing hands after doing

activities, thereby reducing the incidence of diarrhea in children, which is in line with research by Stefen Anyerdy Taosu and R. Azizah 2013 which said that washing hands is an important habit that can prevent disease transmission. Disease germs such as bacteria, viruses, parasites and fungi are invisible to the naked eye and sense of smell. As a result of the habit of washing hands before eating and after defecating can facilitate the transmission of a disease through water, food contaminated with germs, dirty hands, household utensils and germs from the floor carried by the hands when children play on the floor. Thus the transmission of disease can be avoided by the habit of washing hands using clean water and using soap as in digestive tract infections, especially diarrheal diseases.

CONCLUSION

There is a significant relationship between the incidence of diarrheal disease in children under five during the last six months in the Rowosari II Health Center area in 2020 and the facilities of clean water sources in every house. There is no significant relationship between the incidence of diarrheal disease in children under five during the last six months in the Rowosari II Health Center area in 2020 with latrine ownership facilities. There is no significant relationship between the type of floor and the incidence of diarrheal disease in toddlers during the last six months in the Rowosari II Health Center area in 2020.

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