

RELATIONSHIP BETWEEN ENVIRONMENTAL SANITATION AND THE INCIDENCE OF DIARRHEA IN TODDLERS IN THE WORK AREA OF THE CIRENDEU HEALTH CENTER, SOUTH TANGERANG CITY IN 2022

¹Nurul Anggraini, ²Dewi Purnamawati

^{1,2}Public Health Study Program, Faculty of Public Health, Universitas Muhammadiyah Jakarta
KH. Ahmad Dahlan St., Cirendeudeu, Ciputat, South Tangerang, Banten 15419
Email: anggraininurul62@gmail.com

ABSTRAK

Menurut Organisasi Kesehatan Dunia (WHO) setiap tahun diare menyebabkan 525.000 kematian pada balita dan mengakibatkan 1,7 juta anak di dunia menderita penyakit diare. Hasil Risesdas tahun 2018 menunjukkan prevalensi diare pada semua umur sebanyak 8%, pada balita sebanyak 12,3%, dan pada bayi sebanyak 10,6%. Cakupan pelayanan diare tahun 2021 pada semua umur sebesar 33,6% sedangkan pada balita sebesar 23,8%. Penelitian ini merupakan jenis penelitian kuantitatif dengan desain studi cross-sectional yang menggunakan teknik purposive sampling. Penelitian ini dilakukan pada ibu yang mempunyai balita di Wilayah Kerja Puskesmas Cirendeudeu Tahun 2022. Sampel dalam penelitian ini sebanyak 77 responden. Teknik analisis data pada penelitian ini adalah univariat dan bivariat dengan menggunakan uji Chi-square. Hasil uji bivariat menggunakan uji Chi-Square dengan $\alpha = 0,005$ ditemukan hasil Ada hubungan antara sanitasi lingkungan dengan kejadian diare pada balita di Wilayah Kerja Puskesmas Cirendeudeu Tahun 2022 dengan ($p\text{-value} = 0,003 \leq \alpha = 0,05$) dan nilai Odds ratio sebesar 6,042. Berdasarkan hasil penelitian, penelitian ini menyatakan bahwa terdapat hubungan antara sanitasi lingkungan dengan kejadian diare pada balita di Wilayah Kerja Puskesmas Cirendeudeu Tahun 2022. Memberikan edukasi pentingnya tempat sampah yang tertutup dan tertutup rapat.

Kata Kunci: Diare, sanitasi lingkungan, balita

ABSTRACT

According to the World Health Organization (WHO) each year diarrhea causes 525,000 deaths in toddlers and results in 1.7 million children in the world suffering from diarrheal diseases. Risesdas results in 2018 showed the prevalence of diarrhea in all ages as much as 8%, in toddlers as much as 12.3%, and in infants as much as 10.6%. Sample Registration System The coverage of diarrhea services in 2021 at all ages was 33.6% while in toddlers it was 23.8%. This research is a type of quantitative research with a cross-sectional study design that uses purposive sampling techniques. This research was conducted on mothers who have toddlers in the Cirendeudeu Health Center Working Area in 2022. The sample in this study was 77 respondents. The data analysis technique in this study was univariate and bivariate using the Chi-square test. Bivariate test results using the Chi-Square test with $\alpha = 0.005$ found results There is a relationship between environmental sanitation and the incidence of diarrhea in toddlers in the Cirendeudeu Health Center Working Area in 2022 with ($p\text{-value} = 0.003 \leq \alpha = 0.05$) and a Odds ratio value of 6.042. Based on the results of the study, this study states that there is a relationship between environmental sanitation and the incidence of diarrhea in toddlers in the Cirendeudeu Health Center Working Area in 2022. Provide education on the importance of trash cans that are closed and tightly closed.

Keywords: Diarrhea, environmental sanitation, toddlers

INTRODUCTION

Environmental conditions are very influential on health both individually and in the wider community (1). Health problems that exist in the community can arise from the lack of clean water,

which can lead to poor personal hygiene and environmental sanitation so it becomes the beginning of the development of infectious diseases (2). Risk factors that influence the incidence of diarrhea in toddlers include environmental sanitation (the use of clean water facilities, family latrines, and garbage disposal) (3).

Sanitation is a condition that can affect the condition of health problems related to human feces and infections that are directly related to drainage, and removal of feces and garbage from households (4). Poor environmental sanitation can cause the incidence of diarrhea to increase, on the contrary, if the environmental sanitation is very good, it can reduce the incidence of diarrhea (5).

Diarrhea is a condition when a person or toddler experiences a liquid and frequent bowel movement in a short time with a frequency of defecation three or more times in the last three months (6). Diarrheal diseases have several related factors, including the absence of clean water, water that has been polluted with feces, and a less-than-optimal environment. If the environment is unhealthy and has been polluted by diarrhea germs, the transmission of diarrhea is easier (7).

Diarrhea is a disease caused by infection with microorganisms present in the environment. This diarrheal disease is related to the mouth and is spread almost all over the world (8). In children, diarrhea can be caused by bacterial infections such as microscopic worms (9). In Indonesia, diarrhea is still a dilemma problem that often causes klb (extraordinary events). Factors that can trigger the incidence of diarrheal outbreaks are very poor environmental sanitation factors (10). Diarrhea is also declared a deadly second disease affecting children and toddlers (11).

In children and toddlers, the type of disease and cause of death is caused by germs that enter the mouth through food, water, and unclean hands. Poor hygiene and environmental health including clean water supplies can cause 88% of deaths in children and toddlers worldwide due to diarrheal diseases (12). In living daily life cleanliness is very important and needs to be considered, because hygiene can affect a person's health and psychic (13). In addition, education also has a significant influence (14).

According to the World Health Organization (WHO), diarrhea is still a major problem in all age groups including toddlers. Diarrhea is ranked second as the leading cause of death for toddlers in the world, although it can be cured and treated (15). Annually diarrhea causes 525,000 deaths in children under five and results in 1.7 million children in the world suffering from diarrheal diseases (16). The results of a study uploaded by the Lancet in 2016 showed that diarrhea was the 8th cause of death at all ages and ranked 5th as the cause of death in toddlers (17). In developing countries, diarrhea occurs a lot, in countries that have low incomes. Of all under-five deaths due to diarrheal diseases, 78% occurred in Africa and Southeast Asia (18).

Riskesdas results in 2018 showed the prevalence of diarrhea in all ages as much as 8%, in toddlers as much as 12.3%, and in infants as much as 10.6%. *Sample Registration System* The coverage

of diarrhea services in 2021 at all ages was 33.6% while in toddlers it was 23.8%. The disparity in diarrhea service coverage at all ages in North Sumatra province is 6.7% and in Banten province 68.6%. Furthermore, the disparity in diarrhea service coverage for toddlers in North Sumatra province is 3.3% and for Banten province 55.3% (19).

The results of the research were conducted by conducting a study on the relationship between clean water facilities and the incidence of diarrhea in toddlers in the Karanganyar Puskesmas Work Area. The results shown were the relationship between clean water facilities and the incidence of diarrhea in toddlers. Because respondents who do not have the physical quality of clean water will be easily infected with diarrheal diseases. The people who were respondents to the study used wells as their source of clean water. The well they used was outside the house without a cover or roof that closed the well (20).

Based on the results of a preliminary study conducted by researchers at the research site at posyandu Dahlia 3 to mothers who have toddlers, it shows that there is still low maternal knowledge about diarrhea in toddlers and the lack of proper sanitation that exists, this is because when toddlers experience diarrhea, they do not immediately get the help of doctors but are given stall medicine. In addition, the quality of the water in their homes is not good which requires them to buy gallons of water for consumption, the condition of the trash cans they have is also there that does not have a lid so the garbage is covered with flies, the cleanliness of their latrines is sometimes still not considered because it is rarely cleaned.

Based on the existing problems, researchers are interested in conducting a study entitled "The Relationship between Environmental Sanitation and the Incidence of Diarrhea in Toddlers in the Cireundeu Health Center Work Area".

METHOD

This research is a type of quantitative research with a *cross-sectional* study design that uses *purposive sampling* techniques. This research was conducted on mothers who have toddlers in the Cireundeu Health Center Working Area in 2022. This study was conducted by collecting data on respondents' characteristics, environmental sanitation, and the incidence of diarrhea in toddlers using questionnaires. The sample in this study was 77 respondents. The dependent variable in this study is the incidence of diarrhea, while the independent variable in this study is environmental sanitation. This research has gone through an ethics review process and obtained the feasibility of research ethics by the ethics commission of the Faculty of Public Health with ethics number No.10.034.B/KEPK-FKMUMJ/I/2023. Data analysis techniques in this study were carried out by gradually including univariate analysis to calculate frequency distribution, and bivariate analysis to see the relationship between dependent variables and independent variables using *Chi-square*. Data analysis in this study used the help of *software*.

RESULTS AND DISCUSSION

Based on table 1. It is known that as many as 77 respondents, there were 59.7% of mothers aged 26-35 years. Meanwhile, as many as 9.1% of mothers have the age of 17-25 years. There were 26.0% of working mothers, while 74% showed the results of unemployed mothers. There were 50 respondents (64.9%) who had a high school education. While as many as 4 respondents (5.2%) the least had an education after elementary school, there were 40 (51.9%) toddlers aged 1-4 years. Meanwhile, toddlers aged 5-6 years were 3 (3.9%) toddlers, and as many as 36 (46.8%) respondents were male. Meanwhile, as many as 41 (53.2%) respondents were female. It can be seen that as many as 24 (57.1%) respondents have diarrhea in toddlers, while as many as 53 (68.8%) respondents do not have diarrhea in toddlers. Respondents who had an unqualified state of environmental sanitation were 44 (57.1%), while respondents who had an eligible environmental sanitation state were 33 (42.9%).

Table 1. Frequency Distribution

Characteristic	Sum	Percentage (%)
Mother's Age		
17-25	7	9.1
26-35	46	59.7
36-45	24	31.2
Work		
Work	20	26.0
Not Working	57	74.0
Education		
Finished Sd	4	5.2
Finished junior high school	12	15.6
Graduated from high school	50	64.9
Finished PT	11	14.3
Toddler Age		
0-2	34	44.2
1-4	40	51.9
5-6	3	3.9
Toddler Gender		
Man	36	46.8
Woman	41	53.2
Incidence of Diarrhea		
Diarrhea	24	31.2
No Diarrhea	53	68.8
Enviromental Sanitation		
Ineligible	44	57.1
Qualify	33	42.9

The results of the analysis of the relationship between environmental sanitation and diarrhea incidence were 20 (45.5%) respondents who had an environmental sanitation state were not eligible to experience diarrhea events, while as many as 29 (87.9%) respondents who had environmental sanitation conditions were eligible not to experience diarrhea events. After being tested statistically using *the chi-square* test with *a continuity correction* test, a p-value of 0.003 was obtained. From the results of the analysis, an OR value of 6.042 was obtained, meaning that the incidence of diarrhea that meets the

environmental sanitation requirements at the Cireundeu Health Center has a 6.042 times chance of avoiding diarrheal diseases compared to people who have an unqualified environmental sanitation condition.

Table 2. Distribution of The Relationship between The Independent Variable and The Dependent Variable

Variable	p-value	Description
Environmental Sanitation	0.003	There is a relationship

Diarrhea is a condition when a person or toddler experiences a liquid and frequent bowel movement in a short period with a frequency of defecation three or more times in the last three months. (6). Diarrhea is also known as a common symptom in digestive system disorders caused by a wide variety of pathogens such as viruses, bacteria, and parasites (21).

According to the *World Health Organization* (WHO), diarrheal disease is still the main cause of problems in all age groups, including toddlers. Diarrhoeal disease is ranked second as the leading cause of death for toddlers in the world, as many as 525,000 every year toddlers die from diarrheal diseases. 78% of under-five deaths from diarrhea occur in Southeast Asia and Africa (17).

At the age of toddlers, their health conditions are still not balanced, making it easier for toddlers to develop infectious diseases such as diarrhea (22). In Indonesia, diarrheal disease is still a bad problem because it can cause klb (extraordinary events) factors that can cause klb in diarrheal disease, one of which is poor environmental sanitation (11).

Environmental sanitation is one way to carry out disease prevention which is carried out by controlling environmental, physical, chemical, biological, and social risk factors (23). According to Agustina, environmental sanitation is an effort per individual or community to pay attention to and control the environment to avoid health problems caused by environmental factors (24).

Poor environmental sanitation conditions can cause diarrhea events to increase, while if the environmental sanitation conditions are very good, it will reduce the incidence of diarrhea (5). Diarrheal disease is an environmental-based disease, Several factors that can be related to environmental sanitation and the incidence of diarrhea are the lack of clean water available, water that has been polluted with feces, and an inadequate environment. An unhealthy environment contaminated with diarrheal germs can cause easier transmission of diarrhea (7).

According to Agustina, family trash cans have a significant relationship to diarrheal diseases. If the family does not have a good trash can, flies will easily perch and make a breeding ground that can contaminate the food consumed by toddlers and cause diarrhea (24).

Based on the results of this study Based on the results, it can be seen that 20 (45.5%) respondents have an environmental sanitation state that is not eligible to experience diarrhea events, while as many as 29 (87.9%) respondents who have an environmental sanitation condition are eligible not to experience diarrhea events.

After being tested statistically using the *chi-square* test with a *continuity correction* test, a *p*-value of 0.003 was obtained. Based on these results, it can be concluded that there is a relationship between environmental sanitation and the incidence of diarrhea at the Cireundeu Health Center in 2022.

From the results of the analysis, an OR value of 6,042 was obtained, meaning that the incidence of diarrhea that meets the environmental sanitation requirements at the Cireundeu Health Center has a 6,042 times chance of avoiding diarrheal diseases compared to people who have an unqualified environmental sanitation condition.

The results of the study conducted by Isramilda are in line with this study which shows that there is a significant relationship between environmental sanitation and the incidence of diarrhea in toddlers. Based on the results of research conducted using the *chi-square* test, a *p*-value of 0.030 was obtained (25). This is also in line with other studies conducted by Zakiyah which said that environmental factors such as drinking water sources, types of fecal dumps, and landfills are related to the incidence of diarrhea in toddlers with statistical test results getting a *p*-value of 0.028 (26).

Based on the results of the hypothesis, it show that there is a relationship between environmental sanitation and the incidence of diarrhea in toddlers in the Cireundeu Health Center Work Area in 2022. This shows that the state of environmental sanitation which is increasingly qualified, has a greater chance of avoiding diarrheal diseases.

CONCLUSION AND SUGGESTIONS

Based on the results of a study conducted on 77 respondents in the Cireundeu Puskesmas Working Area, it can be concluded that there is a relationship between environmental sanitation and the incidence of diarrhea in toddlers. With a *p-value* of 0.003 and an OR value of 6.042. Based on the conclusions, the suggestions that can be given by the investigator are as follows: Conduct a survey on the condition of environmental sanitation in the Puskesmas work area, including access to clean water, garbage disposal, and sanitation facilities and providing education about the importance of trash cans that have closed and closed tightly.

REFERENCES

1. Rijal S, Ningsih H. Relationship of Environmental Sanitation with the Incidence of Diarrhea in Toddlers After the Earthquake in the UPT Blud Work Area of the Tanjung Health Center, North Lombok Regency. *J Sanitation And Context* [Internet]. 2018;10(10):36–46. Available from: <https://e-journal.sttl-mataram.ac.id>
2. Nurhaedah N. The Relationship Between Environmental Sanitation and the Incidence of Diarrhea in the Elderly. *J Ilm Health Sandi Husada*. 2019;9(1):30–2.
3. Katiandagho D, Darwel D. Relationship of Clean Water Supply and Family Latrines with the Incidence of Diarrhea in Toddlers in Mala Village, Manganitu District in 2015. *J Healthy*

- Independent. 2019;14(2).
4. Nur NH, Rahmadani N, Hermawan A. Relationship of Environmental Sanitation with the Incidence of Diarrhea in Toddlers in the Working Area of puskesmas Pertiwi Makassar City. *Media Publ Promotion of Indonesian Health*. 2022;5(3):298–303.
 5. Anggi HAK, Lili PW, Nuraisah SOT, Tri PB. The Relationship between Environmental Sanitation and the Incidence of Diarrhea in Toddlers. *J Health*. 2021;11(2):100–7.
 6. Ministry of Health of the Republic of Indonesia. Guide to Socialization of Toddler Diarrhea Management [Internet]. Ministry of Health of the Republic of Indonesia. Jakarta: Ministry of Health of the Republic of Indonesia; 2011. Available from: <https://agus34drajat.files.wordpress.com/2010/10/buku-panduan-sosialisasi-tata-laksana-diare-balita-2011.pdf>
 7. Noviana Z, Julia F. Relationship between Environmental Sanitation and The Incidence of Diarrhea in Toddlers in the Tanah Pasir Health Center Working Area. *J Ilm Science, Teknol Ekon Sos and Culture*. 2021;5(2):17–21.
 8. Utami T, sometimes Y, Justitia AK, Justitia AK. Factors Affecting the Incidence of Diarrhea in Toddlers in the Working Area of the Birobuli Health Center, Palu City. *An Idea Heal J*. 2022;02(01):35–40.
 9. Suherman, Aini FQ. Analysis of the Incidence of Diarrhea in Students at SD Negeri Pamulang 02 Pamulang District in 2018. *J Kedokt And Health*. 2018;15(2):199–208.
 10. Emiliasari D. Relationship of Clean and Healthy Living Behavior (Phbs) Households with the Incidence of Diarrhea in Toddlers at Puskesmas 23 Ilir Palembang in 2022. *J Health Science Mandira Cendikia* [Internet]. 2022;1(2):14–25. Available from: <http://journal-mandiracendikia.com/index.php/JIK-MC/article/view/96>
 11. Haenisa NN, Surury I. Relationship of Personal Hygiene with the Incidence of Diarrhea in Santri in South Tangerang City. *J and Lokl Tek Kesehat Lingkung* [Internet]. 2022;19(2):231–8. Available from: <https://ejournal.kesling-poltekkesbjm.com>
 12. Triana S, Ernyasih. The Relationship between Knowledge and Student Attitudes towards Clean and Healthy Living Behavior at SD Negeri Sampora 1 Cisauk District in 2018. *Muhammadiyah Public Heal J* [Internet]. 2020;1(1):1–9. Available from: <http://journal.um-surabaya.ac.id/index.php/JKM/article/view/2203>
 13. Fauziah M, Asmuni A, Ernyasih E, Aryani P. Personal Hygiene Counseling for Risk Factors for Infectious Diseases in Students of Pesantren Sabilunnajat Ciamis West Java. *J Devoted and Empowering The Health of The Community*. 2021;2(1):55.
 14. Jiwanti S, Purnamawati D, Widastuti E. Factors Related to Nurse Professionalism in Hospital Inpatient Installations. *J Nursing*. 2022;14(S3):625–32.
 15. Fera N. Factors Related to the Incidence of Diarrhea in Toddlers. *Scholar Med*. 2019;4(1).

16. Urge AYG, Urge PSFM, Nyoman WS. An overview of the level of maternal knowledge about diarrhea in toddlers in Baler Bale Agung Village, Jembrana Regency in 2021. *J heal med sci* [internet]. 2022;1(3):15–26. Available from: <https://pusdikra-publishing.com/index.php/jkes/home>
17. Ira. Looking at the Development of Diarrhea in Indonesia [Internet]. Media Kom Ministry of Health of the Republic of Indonesia. 2019 [cited 2023 Jan 10]. p. 1. Available from: <https://mediakom.kemkes.go.id/2019/08/menengok-perkembangan-diare-di-indonesia/>
18. Ahmad R, Dini Y. Relationship of Clean and Healthy Living Behavior (Phbs) with the Incidence of Diarrhea in Children Under Five. *KOSALA J Health Sciences*. 2022;10(1):16–22.
19. Ministry of Health of the Republic of Indonesia. Indonesia Health Profile 2021 [Internet]. Farida S, Boga H, Winne W, editors. Jakarta: Ministry of Health of the Republic of Indonesia Road; 2021. Ministry of Health of the Republic of Indonesia. Available from: <http://www.kemkes.go.id>
20. Menik S, Suhartono, Dharminto. The Relationship between Home Environmental Sanitation and the Incidence of Diarrhea in Toddlers in the Karanganyar Puskesmas Working Area, Pekalongan Regency. *J Health Masy* [Internet]. 2019;7(1):388–95. Available from: <http://ejournal3.undip.ac.id/index.php/jkm%0Akematian>
21. Machava NE, Salvador EM, Mulaudzi F. Assessment of Diagnosis and Treatment Practices of Diarrhoea in Children Under Five in Maputo-Mozambique. *Int J Africa Nurs Sci* [Internet]. 2022;17:100507. Available from: <https://doi.org/10.1016/j.ijans.2022.100507>
22. Hastia S, Ginting T. Relationship of Environmental Sanitation and Personal Hygiene of Mothers with the Incidence of Diarrhea in Toddlers in Sidorejo Puskemas Village, Often Medan City. *J Prima Med Science*. 2019;1(1):12–7.
23. Ministry of Health of the Republic of Indonesia. Decree of the Minister of Health of the Republic of Indonesia Number Hk.01.07 / Menkes / 4788/2021 concerning Professional Standards for Environmental Sanitation Workers [Internet]. 2021st ed. Jakarta: Minister of Health of the Republic of Indonesia; 2021. 1–60 p. Available from dish.kemkes.go.id
24. Agustina, Dukabain OM, Singga S, Wanti W, Suluh DG, Mado FG. Home Sanitation Facilities and Prevalence of Diarrhea for Children in Oelnasi Village, Kupang Tengah Sub-district. *Gac Sanit*. 2021;35:S393–5.
25. Isramilda I. The Relationship Between Home Environmental Sanitation and Maternal Personal Hygiene with the Incidence of Diarrhea in Toddlers in Tanjung Kelengking Village, Rempang Cate Village, Batam City in 2019. *Zo Kedokt Progr Stud Educator Dr Univ Batam*. 2021;10(1):26–34.
26. Zakiyah Y, Elyk MD, Fitrul F. Environmental Factors Related to the Incidence of Diarrhea in Toddlers at the Batang-Bantang Health Center, Sumenep Regency. *J Health Sciences* [Internet]. 2018;3(1):1–17. Available from: <http://dx.doi.org/10.1080/01443410.2015.1044943%0Ahttp://dx.doi.org/10.1016/j.sbspro.2010.0>



3.581%0Ahttps://publications.europa.eu/en/publication-detail/-/publication/2547ebf4-bd21-46e8-88e9-f53c1b3b927f/language-en%0Ahttp://europa.eu/.%0Ahttp://www.leg.st