

Article

Determinants of Diarrhea Disease Environmental Conditions in Manutapen Village Kupang City

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ABSTRACT

One of the environmental-based diseases that is still often found in developing countries is diarrheal disease. Diarrhea can also cause death. Limited toilet facilities in Manutapen Village, Kupang City could be one of the causes of the high number of diarrhea cases in the area. This type of research is descriptive with a survey method. Cross sectional sampling. The data taken is primary and secondary data. The results of the study showed that as many as 87.10% of diarrhea sufferers were >5 years old, the distance is cubluk/resapans in toilets for diarrhea sufferers < 10 meters from the well are 12.90%, condition of toilet floors in houses of diarrhea sufferers that are not tight is 74.20%, condition of dirt/feces entry holes in open latrines is 6.45%, length/ The width of the latrine floor in the house of diarrhea sufferers which is < 1 meter is 67.74%, the latrine house of diarrhea sufferers which does not have a roof is 19.35%. The conclusions that can be drawn are the distance of the cesspool to the source of clean water, the condition of the latrine floor, the condition of the dirt entry hole, the size of the floor area and the condition of the latrine house which does not meet health requirements can be factors that cause diarrhea.

I. INTRODUCTION

Diarrhea is an environmental-based disease. There are many factors that cause diarrhea and include environmental factors such as clean water facilities, disposal of human waste, waste water drainage, house conditions, and personal hygiene (Yantu et al., 2021). Diarrhea can cause anorexia or lack of appetite, can reduce the intestinal absorption of food essence, thereby reducing nutritional intake and can cause important malnutrition, especially in children. If this continues continuously, it can result in growth disorders in children (Sengkey et al., 2020).

Diarrhea cases that occur worldwide cause 4% of all deaths. According to WHO (World Health Organization) data, 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. Diarrhea in Indonesia in 2018 showed that there were 4,165,789 diarrhea sufferers who were served in health facilities, of which 1,516,438 (36.4%) were toddlers, in South Kalimantan alone there were 28,056 (41.62%) toddlers who received treatment for diarrhea in health services (Kasman & Ishak, 2020).

Atmospheric conditions, including climate change, are phenomena that can have a global impact. Climate change is a change in the physical conditions of the earth's atmosphere such as temperature and distribution of rainfall and others. Human health conditions can be affected by climate change. Climate can have an impact on water quality, where clean water contaminated with microorganisms can function as a medium for the spread of disease (*water borne disease*) for diarrheal disease. Microorganisms that can contaminate water include: *Salmonella sp*, *Campylobacter jejuni*, *Staphylococcus aureus*, *Bacillus cereus*, *Cryptosporidium* dan *Enterohemorrhagic Escherichia coli*. For every 1°C increase in temperature in the dry season, diarrhea sufferers will increase by 4% and in the rainy season diarrhea sufferers will increase 12% for every 1°C increase in temperature. The increase in monthly cases is 3% for every 1°C increase in temperature (Padji & Sudarmadji, 2023).

According to the World Health Organization (WHO), one of the efforts to prevent diarrhea is environmental sanitation, which is an activity to monitor the provision of drinking water, disposal of feces and waste water, disease vectors, waste disposal, atmospheric conditions and work safety, housing conditions, provision and food handling (Yantu et al., 2021). Disposal of sewage, in this case the disposal of human feces or excreta, is an important part of environmental sanitation. Disposal of feces needs special attention because it causes many problems in the health sector. Feces are a source of contaminants that contain many disease-generating media. Apart from this, feces can cause environmental pollution in water sources, it can also cause foul odors and aesthetics (Syahrir et al., 2019). According to Minister of Health Decree no. 852 of 2008 concerning the National Strategy for Community-Based Total Sanitation (STBM), a healthy latrine is an effective feces disposal facility for breaking the chain of disease transmission (Sulaehani, 2019).

Data from the East Nusa Tenggara Province Central Statistics Agency explains that the number of diarrhea cases in NTT Province from 2016 to 2018 was 91,938, 112,379 and 89,689 cases. The number of diarrhea cases in Kupang City for the period of that year was 6,986, 11,143 and 6,772 cases. experienced fluctuations every year from 2015 to 2018. Kupang City is an area where many cases of diarrhea are found, which in 2018 found 6,772 cases of diarrhea. Diarrhea cases in Kupang City include a higher number of cases than diarrhea cases in other districts in NTT Province. Alak District is one of the sub-districts in the Kupang City area which had very high cases of diarrhea in 2018, namely 5,946 cases. Manutapen Village is one of the villages in Alak District with 336

cases of diarrhea in 2018, consisting of 178 men and 158 women. The increase in cases is strongly influenced by changes in weather or seasons, especially the availability of water in the community. The highest cases occurred in January, July and August.

The high number of diarrhea cases in Alak Subdistrict, especially in Manutapen Subdistrict, is due to limited clean water facilities that meet the requirements, and limited family toilet facilities that are suitable and healthy. There are still people who throw excretory feces into other people's latrines (using shared latrines), which creates an opening for germs that cause diarrhea to spread easily and transmit diarrheal disease. Improper disposal of infected human feces without meeting sanitation requirements can cause contamination of soil and clean water sources. Apart from that, it will also provide opportunities for flies and certain species to lay eggs, nest, eat these parts and carry infections.

II. METHODS

This type of research is descriptive with a survey method. Sampling was carried out randomly *Cross Sectional* (Suhron, 2024). The sample in this study was all latrines in the homes of diarrhea sufferers from the last 6 months (December to May 2021) from the Manutapen Health Center register report, namely 31 latrines. Research data was collected from secondary data and field observations using *check list*, then processed and analyzed descriptively.

III. RESULT

1. Distribution of Diarrhea Sufferers According to Age

The distribution of diarrhea sufferers according to age in Manutapen Village can be seen in Table 1 below.

Table 1. Distribution of Diarrhea Sufferers According to Age in Manutapen Village, Alak District, Kupang City, 2021

No.	Age distribution	Amount	Percentage (%)
1	< 1 year	0	0
2	15 years	4	12,90
3	> 5 years	27	87,10
Total		31	100,00

Table 1 shows that there were 4 people with diarrhea aged 1 – 5 years (12.90%) and 27 people with diarrhea aged >5 years (87.10%).

2. Distance of Cubluk/Infiltration from the Well

The distance of the pit/latrine catchment for diarrhea sufferers from the well can be seen in table 2.

Table 2
Distance of Cubluk/Infiltration From Wells in Latrines for Diarrhea Sufferers in Manutapen Village, Alak District, Kupang City, 2021

No.	Distance	Amount	Percentage (%)
1	< 10 meter	4	12,90
2	≥ 10 meter	27	87,10
Amount		31	100,00

Table 2 shows that the distance of the cesspool/respan in the latrine for diarrhea sufferers was < 10 meters from the well for 4 latrines (12.90%) and the ≥ 10 meters from the well there are 27 latrines (87.10%).

3. Latrine Floor Condition

The condition of the latrine floor in the house of diarrhea sufferers based on density can be seen in Table 3.

Table 3.
Floor Conditions in Latrines for Diarrhea Sufferers In Manutapen Village, Alak District, Kupang City Year 2021

No.	Latrine Floor Condition	Amount	Percentage (%)
1	No meeting	23	74,20
2	Meeting	8	25,80
Amount		31	100,00

Table 3 shows that the condition of the latrine floors in the homes of diarrhea sufferers was that 23 toilets were not tight (74.20%) and 8 toilets were tight (25.80%).

4. Condition of Sewage Entry Hole

Condition of the inlet hole dirt/feces in the latrine at home for diarrhea sufferers can be seen in Table 4.

Table 4
Condition of the Sewer Entry Hole in the Latrine for Diarrhea Sufferers In Manutapen Village, Alak District, Kupang City in 2021

No.	Dirt Hole	Amount	Percentage (%)
1	Open	2	6,45
2	Closed	29	93,55
Amount		31	100,00

Table 4 shows that the condition of the entry holes for feces/feces in open latrines was 2 latrines (6.45%) and in closed latrines there were 29 latrines (93.55%).

5. Floor Length/Width

The length/width of the latrine floor in the house of diarrhea sufferers can be seen in Table 5.

Table 5.
Length/Width of Floors in Latrines for Diarrhea Sufferers
In Manutapen Village, Alak District, Kupang City in 2021

No.	P/L size of toilet floor	Amount	Percentage (%)
1	< 1 meter	21	67,74
2	≥ 1 meter	10	32,26
Amount		31	100,00

Table 5 shows that the length/width of the latrine floor in the house of diarrhea sufferers who were < 1 meter was 21 latrines (67.74%) and those who ≥ 1 meter is 10 latrines (32.26%).

6. Condition of Latrine Houses

The condition of toilets in the homes of diarrhea sufferers based on roof ownership can be seen in Table 6.

Table 6
Condition of Latrine Houses in Latrines for Diarrhea Sufferers
In Manutapen Village, Alak District, Kupang City
Year 2021

No.	Latrine House	Amount	Percentage (%)
1	Doesn't have a roof	6	19,35
2	Has a roof	25	80,65
Amount		31	100,00

Table 6 shows that there are 6 toilets for diarrhea sufferers without roofs (19.35%) and 25 toilets with roofs (80.65%).

IV. DISCUSSION

1. Distribution of Diarrhea Sufferers According to Age

The results of the study showed that diarrhea cases in Manutapen Village were more common in sufferers aged >5 years. These ages include children, teenagers and adults.

The incidence of diarrhea can be influenced by environmental, sociodemographic and behavioral factors (Utami & Luthfiana, 2016).

The most dominant environmental factor in the spread of diarrheal disease is feces disposal. The existence of latrines that are not used and are not managed well by the family can be one of the causes of diarrhea. The use of family latrines can be influenced by attitudes, latrine ownership, the role of health workers and the role of community leaders. In this regard, it is necessary to trigger the community so that public awareness arises of good behavior in using toilets. If latrines are used properly, they can reduce the incidence of diarrhea in the community (Mathofani et al., 2020).

Sociodemographic factors that influence the spread of diarrhea include age, occupation and education level. The older a person is, the better their immune system will be. The higher a person's level of education and income, the better the prevention efforts against diarrhea (Utami & Luthfiana, 2016). The research results show that the age groups that suffer from diarrhea are children, teenagers and adults. At childhood, health status is influenced by the level of education and knowledge of parents. The mother is the parent who plays the most role in the household and status Children's health. A mother's bad health behavior greatly influences the incidence of

diarrhea in children (Wahyudi et al., 2020). In adolescence and adulthood, health status is influenced by individual knowledge (Pradono & Sulistyowati, 2013).

Behavior in using the latrine can be realized if confidence is formed in a person which is driven by knowledge and a good attitude towards this matter. So it can lead to efforts to make good use of latrines and diarrheal diseases can be prevented (Apriyanti et al., 2018).

2. Distance of Cubluk/Infiltration from the Well

The results of the research show that there are toilets for diarrhea sufferers that have a pit/absorption distance of <10 meters from the well. Even though the percentage is small, namely 12.90%, this is a risk factor for cases of diarrhea in the community.

The location of the catch basin/seepage close to a well as a source of clean water can cause the water source to be contaminated by diarrhea-causing bacteria found in feces. This is in accordance with research (Yantu et al., 2021) which explains that there is a relationship between clean water sanitation and the incidence of diarrhea. The distance of the water tank/seepage that is less than 10 meters from the water source can allow bacteria that cause diarrhea to reach the water source and contaminate it, so that the user community is at risk of being contaminated by these bacteria and experiencing diarrhea.

3. Latrine Floor Condition

As many as 74.20% of toilet floors owned by diarrhea sufferers are cracked and not tight. This condition causes gaps in the latrine floor. The gaps formed allow various kinds of dirt, including microorganisms that cause diarrhea, to be trapped and inside. This cracked and loose floor is one of the reasons why the latrine does not meet health requirements.

Families that use toilets that meet health requirements are 5.04 times more likely not to experience diarrhea than those who do not (Wahyudi et al., 2020).

4. Condition of Sewage Entry Hole

Research data shows that the type of latrine used by sufferers in Manutapen Village is a sink type latrine without a lid and a goose neck. It is known that from the type of latrine used, data was obtained regarding the condition of the entry holes for feces/feces in the latrine, namely 2 open pits (6.45%) and 29 closed pits (93.55%). The condition of the dirt/stool inlet hole being open is because the type of latrine used is a plunge latrine without a lid.

The condition of the pit latrines without lids that were found did not meet health requirements and was a very high risk factor for cases of diarrhea. Flies and cockroaches can enter through the dirt entry hole and can reach the feces in the bowl. This can be one route for the spread of diarrheal disease where disease agents are carried by vectors into water and food consumed by humans. Thus, the quality of latrines is closely related to the incidence of diarrhea (Duwila et al., 2018). In this regard, one way to break the chain of transmission of diarrheal disease is that pit latrines are required to have a cover which functions to prevent odors from coming out of the waste inlet hole and to prevent the entry of flies and cockroaches (Hidayati & Abidin, 2016).

5. Floor Length/Width

The latrine floor should be wide enough and measure at least 1 x 1 meter and be made quite sloping/sloping towards the drain hole. Research data shows that as many as 21 latrines (67.74%) of diarrhea sufferers had a floor size with a length/width of the latrine floor < 1 meter. These conditions make the latrine space very narrow. The narrow latrine space causes limited movement, making the latrine difficult to clean. Besides that, a narrow room will make you feel bored No comfortable for the user.

Toilet rooms that are difficult to clean can cause dirty conditions. Likewise with the floor. The environmental conditions of dirty latrines can cause diarrhea germs to accumulate in them and trigger the spread of diarrheal disease more quickly (Hayati et al., 2021).

6. Condition of Latrine Houses

One of the requirements for a latrine that meets health requirements is that the latrine must be equipped with a latrine house. The latrine house must also be equipped with closed walls and roof. This is related to user privacy. The latrine must be a closed house so that users are protected from the view of other people, protected from heat and/or rain (Goni et al., 2013). Apart from the privacy aspect, closed latrine houses are also related to ethical and aesthetic values.

The results of the research show that there are still latrine houses that do not have roofs, namely 6 latrine houses (19.35%). This can result in user discomfort regarding privacy and also the latrine user not being protected from hot weather and/or rain.

Latrine must not only be comfortable for the user, but must also be able to protect the user from disease so that it can improve the health status of the family (Setia & Saiful, 2021).

V. CONCLUSION

Based on the results and discussion, it can be concluded that the distance of the latrine to the source of clean water, the condition of the latrine floor, the condition of the dirt entry hole, the size of the floor area and the condition of the latrine house which does not meet health requirements can be factors that cause diarrhea.

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