Factors Associated With The Incidence of Diarrhea in Toddlers in The Meureubo Health Center Working Area, Meureubo Sub-District, West Aceh District in 2023

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Abstract

Diarrhea is a potential endemic disease that can result in extraordinary outbreaks (KLB) and is often associated with mortality. According to data from the Meureubo Health Center in 2022, this center recorded the highest percentage of diarrhea cases among toddlers, reaching 67%. This study aims to examine the relationship between several factors clean water sources, latrine facilities, household waste management, wastewater disposal, maternal knowledge and education, nutritional status, personal hygiene, and environmental sanitation and the incidence of diarrhea in toddlers within the Meureubo Health Center working area, Meureubo District. This quantitative research utilizes a cross-sectional design and was conducted from May 13-29, 2023. The population includes all toddlers in the Meureubo Health Center working area, with a sample size of 97. Proportional random sampling was used to select the 97 respondents. Data were analyzed using the chi-square test with Stata 15, including univariate and bivariate analyses. The univariate results show that 43.30% of toddlers experienced diarrhea, 19.58% lacked access to clean water, 5.15% had inadequate latrine facilities, 57.73% faced insufficient household waste management, and 21.65% had improper wastewater disposal systems. Additionally, 30.93% of mothers had poor knowledge, 35.05% had a primary education level, 20.62% of toddlers were malnourished, and 39.18% had poor personal hygiene and environmental sanitation. Bivariate analysis reveals significant relationships between diarrhea incidence in toddlers and clean water sources (p-value: 0.0001), latrine facilities (p-value: 0.013), household waste management (p-value: 0.0001), wastewater disposal (p-value: 0.0001), maternal knowledge (p-value: 0.0001), maternal education (p-value: 0.036), nutritional status (p-value: 0.022), and personal hygiene and environmental sanitation (p-value: 0.0001). It is recommended that health workers, particularly those in health promotion, provide counseling on personal hygiene and environmental cleanliness.

Keywords: *Diarrhea, Toddler, Personal Hygiene.*

Introduction

Diarrhea is a potential endemic disease that can lead to outbreaks (KLB) and is often associated with fatal outcomes. The target service coverage for children under five with diarrhea who visit health facilities is set at 20% of the estimated number of diarrhea cases. In 2019, 24,690 children under five, or 32% of the estimated cases, received treatment at health facilities. Diarrhea is closely linked to environmental health factors and occurs when there is a change in the consistency of stool, not just the frequency of bowel movements. Diarrhea is diagnosed when the stool becomes more watery than usual, or when bowel movements occur three or more times within 24 hours, with watery but non-bloody stool. According to WHO (2020), diarrhea ranks as the third leading cause of death across all age groups. In 2019, there were 1,591,944 cases of diarrhea among children under five, representing 40% of the estimated cases treated at health facilities. Furthermore, Riskesdas reports that diarrhea is more prevalent among children under five, with a prevalence rate of 11.4%, or approximately 47,764 cases, in males, and 10.5%, or around 45,855 cases, in females. Diarrhea continues to be a significant public health issue in many developing countries, including Indonesia, due to its high rates of morbidity and mortality.

According to the Indonesian Ministry of Health (2019), diarrhea is the second leading cause of death in children under five, the third in infants, and the fifth across all age groups. On average, each toddler in Indonesia experiences diarrhea 1.6 to 2 times annually. West Java Province reported the highest number of diarrhea cases in children under five, totaling 933,122, while Aceh Province ranked among the top five with 137,599 cases. Data from the Aceh Health Office in 2019 showed that Banda Aceh had 24,690 cases of diarrhea, or 32%, while West Aceh District recorded 2,983 cases in 2020, representing 53.2%. The Meureubo Health Center reported the highest incidence, with 67% of diarrhea cases occurring in children under five (Meureubo Health Center, 2022). Various factors contribute to the high incidence of diarrhea, including environmental conditions, nutrition, population factors, education, socioeconomic status, and community behaviors that either directly or indirectly affect the spread of the disease (Purwanti DY and Ratna Sari, 2020). Factors linked to diarrhea include environmental aspects such as the type and quality of water sources, water microbiology, family latrines, proximity of latrines (less than 10 meters), and housing density. Hygiene practices, like washing hands before eating and avoiding open defecation, are also important. Biological factors, such as how water is prepared or boiled before consumption, and individual factors, like food intolerances, as well as psychological factors like stress and panic, also contribute (Fitriani N, et al, 2021). The primary water source used by families for daily needs, including cooking, drinking, and cleaning, can come from PDAM, boreholes, or refill water. Water is a critical natural resource for both humans and other living organisms, and its importance makes it susceptible to environmental influences. Mismanagement of water resources can lead to significant damage (Kholif, M., 2020).

According to the Indonesian Ministry of Health (2019), diarrhea is the second leading cause of death among children under five, third for infants, and fifth across all age groups. On average, toddlers in Indonesia experience diarrhea 1.6 to 2 times per year. West Java recorded the highest number of diarrhea cases in toddlers with 933,122 cases, while Aceh ranked in the top five with 137,599 cases (MOH, 2019). Data from the Meureubo Health Center indicates that diarrhea cases fluctuate annually. In 2019, there were 337 cases or 9.94%, in 2020 there were 322 cases or 9.50%, and in 2021, 330 cases or 9.74% were reported. Toddlers in Penaga Baroh Village had the highest incidence of diarrhea (Puskesmas Meureubo, 2022). Of the 27 villages within the Meureubo Health Center's coverage area, six villages had the highest number of diarrhea cases: Penaga Baroh Village with 60 cases or 1.7%, East Ranto Panyang Village with 51 cases or 5%, Meureubo Village with 35 cases or 1.03%, West Ranto Panyang Village with 34 cases or 1%, Gunong Kleng Village with 24 cases or 0.7%, and Langung Village with 17 cases or 0.5% (Puskesmas Meureubo, 2022). Several factors, both direct and indirect, contribute to diarrhea. However, some of these factors can be prevented by improving

access to clean water, proper sewage management, maternal knowledge, children's nutritional status, and maternal hygiene and sanitation practices. Puskesmas Meureubo has the highest diarrhea case rate in West Aceh. This study seeks to examine whether factors like clean water sources, latrine facilities, household waste management, maternal knowledge, nutritional status, and hygiene and sanitation of mothers are related to the incidence of diarrhea among children under five in the Puskesmas Meureubo area.

Metodologi

This quantitative research employed a cross-sectional approach, where both the dependent and independent variables were examined simultaneously within the same timeframe (Rukin, 2019). The study aimed to identify the factors linked to the occurrence of diarrhea in toddlers in Meureubo subdistrict. The research took place in the area served by the Meureubo Health Center, located in Meureubo District, West Aceh Regency, Aceh Province, and was conducted from May 13 to May 29, 2023.

Result and Discussion

Table 1. Frequency Distribution of Respondents Based on the Incidence of Diarrhea in Toddlers in the Work Area of the Meureubo Health Center, Meureubo District, West Aceh Regency in 2023.

No	Variabels	Frequency	Percentage	Mean (SD)	Min-Max
1	Age of Toddler			3 (1,43)	0-5
2	Mother's age			30 (5,53)	21-46
3	Mother's occupation				
	PNS	12	12,37		
	Honorer	19	19,59		
	Pedagang	7	7,22		
	Petani	13	13,40		
	IRT	46	47,42		

Source: Data Research

Based on Table 1, it can be seen that the age of toddlers in this study is 0-5 years with an average age of 3 years. The mother's age was 21-46 years with an average age of 30 years and the highest maternal occupation was housewife as much as 47.42%.

Table 2. Frequency Distribution of Respondents Based on Cases of Diarrhea in Toddlers at the Meureubo Health Center Work Area, Meureubo District, West Aceh Regency in 2023.

No	Diarrhea in Toddlers	Frequency	Percentage
1	No Diarrhea	55	56,70

2	Diarrhea	42	43,30
Total		97	100,0

Table 2 shows that 56.70% of respondents did not experience diarrhea, 43.30% of respondents experienced diarrhea.

Table 3. Distribution of Respondents by Clean Water Source in the Meureubo Health Center's Operational Area, Meureubo District, West Aceh Regency, for the Year 2023.

No	Clean Water Source	Frequency	Percentage
1	Eligible	78	80,41
2	Not Eligible	19	19,59
Total		97	100,0

Table 3 shows that 80.41% of respondents with clean water sources met the requirements, as many as 19.59% with clean water did not meet the requirements.

Table 4. Distribution of Respondents by Latrine Facilities in the Meureubo Health Center's Service Area, Meureubo Subdistrict, West Aceh District, for 2023.

No	Latrine Facilities	Frequency	Percentage
1	Eligible	92	94,85
2	Not Eligible	5	5,15
Total		97	100,0

Table 4 shows that as many as 94.85% of respondents with latrine facilities meet the requirements, as many as 5.15% with clean water do not meet the requirements.

Table 5 Distribution of Respondents by Household Waste Management in the Service Area of Meureubo Health Center, Meureubo District, West Aceh Regency, for 2023.

No	Household waste management	Frequency	Percentage
1	Eligible	41	42,27
2	Not Eligible	56	57,73
Total		97	100,0

Table 5 shows that 42.27% of respondents with household waste management meet the requirements, 57.73% with clean water do not meet the requirements.

Table 6 Distribution Of Respondents According To Wastewater Disposal Systems In The Meureubo Health Center's Service Area, Meureubo District, West Aceh Regency, 2023

No	Saluran pembuangan air limbah	Frekuensi	Persentase
1	Eligible	76	78,35
2	Not Eligible	21	21,65
Total		97	100,0

Source: Data Processing

Table 6 shows that 78.35% of respondents with sewerage are eligible, 21.65% with clean water are not eligible.

Table 7 Distribution of Respondents by Maternal Knowledge in the Service Area of the Meureubo Health Center, Meureubo District, West Aceh Regency, 2023

No	Mother's Knowledge	Frequency	Percentage
1	Good	67	69,07
2	Not Good	30	30,93
Total		97	100,0

Source: Data Processing

Based on the results of the analysis of table 6.7, it shows that as many as 69.07% with good maternal knowledge, as many as 30.93% with poor maternal knowledge.

Table 8 Distribution of Respondents by Maternal Education Level in the Meureubo Health Center Service Area, Meureubo District, West Aceh Regency, 2023

No	Mother's Education Level	Frequency	Percentage
1	High	20	20,62
2	Medium	43	44,33
3	Basic	34	35,05
Total		97	100,0

Source: Data Processing

Table 8 shows that as many as 20.62% of mothers with higher education, as many as 44.33% with secondary education, as many as 35.05% with primary education.

Table 9 Frequency Distribution of Respondents by Toddler Nutritional Status in the Meureubo Health Center Area, Meureubo District, West Aceh Regency, 2023

No	Nutritional Status of Toddlers	Frequency	Percentage
1	Good Nutrition	70	72,16
2	Nutrition Excess	7	7,22
3	Undernourished	20	20,62
Total		97	100,0

Source: Data Processing

Table 9 shows that 72.16% of toddlers were well-nourished, 7.22% were overnourished, and 20.62% were under-nourished.

Table 10 Distribution of Respondents by Personal Hygiene and Environmental Sanitation Practices in the Service Area of Meureubo Health Center, Meureubo District, West Aceh Regency, 2023

No	Personal Hygiene and Environmental Sanitation	Frequency	Percentage
1	Good	59	60,82
2	Bad	38	39,18
Total		97	100,0

Source: Data Processing

Based on the results of the analysis of table 6.10 shows that as many as 60.82% with *personal hygiene* and environmental sanitation are good, as many as 39.18% with *personal hygiene* and environmental sanitation are bad.

Table 11 Bivariate Analysis of the Association between Clean Water Sources and the Frequency of Diarrhea Incidence in Toddlers within the Meureubo Health Center's Service Area.

No	Clean Water Source	Diarrhea in Todlers						p value
		Not Diarrhea		Diarrhea		Total		
		n	%	n	%	n	%	
1	Eligible	51	65,38	27	34,62	78	100,0	0,0001
2	Not Eligible	4	21,05	15	78,95	19	100,0	
	Total	55	56,70	42	43,30	97	100,0	

Source: Data Processing

Based on table 11 above, it can be seen that the incidence of diarrhea in toddlers is higher in those who use unqualified clean water sources as much as 78.95%, compared to those who meet the requirements as much as 34.62%. While toddlers do not have diarrhea higher in

those who use clean water sources meet the requirements as much as 65.38%, compared to those who do not meet the requirements as much as 21.05%. The availability of clean water significantly influences the incidence of diarrhea. Research consistently shows a link between access to clean water and diarrhea rates. For instance, Damayanti (2017) found that families with limited access to clean water are more prone to diarrhea compared to those with better water access. Similarly, Padji and Sudarmadji (2017) reported that reduced availability of clean water correlates with increased cases of diarrhea. Utami and Handayani (2017) emphasized that adequate clean water availability is crucial for lowering diarrhea rates in children and reducing child mortality associated with the disease (Marini et al., 2020). Waterborne diseases, including diarrhea, hepatitis A and E, skin infections, and other gastrointestinal disorders, highlight the necessity of providing clean water in sufficient quantity and quality to support personal and environmental hygiene. Ensuring a reliable supply of clean water is a preventive measure against such diseases (Ministry of Health, 2011). Field observations revealed that some respondents with adequate water sources still experienced diarrhea, likely due to other factors like insufficient maternal knowledge. Conversely, some respondents with inadequate water sources did not contract diarrhea, possibly due to better maternal knowledge. This aligns with Christy's research (2014), which asserts that inadequate maternal knowledge can hinder efforts to prevent and manage diarrhea in children. Thus, maternal knowledge emerges as a more influential factor than environmental or socioeconomic conditions in affecting diarrhea incidence among toddlers.

CONCLUSIONS

There is a significant correlation between the availability of clean water sources and the incidence of diarrhea in toddlers, as evidenced by a statistical test result with a p-value of 0.0001. Similarly, the presence of latrine facilities is strongly associated with diarrhea cases in toddlers, with a p-value of 0.013. The study also finds a notable relationship between household waste management practices and the incidence of diarrhea in toddlers, demonstrated by a p-value of 0.0001. The wastewater disposal system is also significantly related to diarrhea occurrences, with a p-value of 0.0001. Maternal knowledge is a key factor influencing diarrhea incidence, supported by a p-value of 0.0001. Additionally, the level of education shows a significant association with diarrhea incidence, with a p-value of 0.036. The nutritional status of toddlers is significantly related to diarrhea, indicated by a p-value of 0.022. Finally, personal hygiene and environmental sanitation are strongly connected to the incidence of diarrhea, with a p-value of 0.0001.

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