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The Relationship Between Environmental Sanitation and Clean Water with Stunting Incidence in Toddlers in Panteraja

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ABSTRACT

Introduction: Stunting is a condition of stunted growth in children caused by poor nutrition, recurrent infections, and lack of psychosocial stimulation. Children are recommended to be stunted if their height is more than two standard deviations below the average child growth standard according to WHO. Stunting remains a serious health problem in Indonesia, especially in Aceh Province, with several areas such as Pidie Jaya Regency experiencing high stunting rates, namely 37.8%. This study aims to evaluate the relationship between environmental sanitation and clean water availability on stunting in toddlers aged 1-5 years in Panteraja District, Pidie Jaya Regency, in 2023.

Objective: To determine whether there is a relationship between Environmental Sanitation and Clean Water and the incidence of Stunting in Toddlers in the Panteraja Health Center Work Area in Pidie Jaya in 2023.

Method: The study used a 1:1 case control design involving 60 stunted toddlers and 60 stunted toddlers, which was conducted in January 2023. Data were collected through questionnaires and analyzed using the Chi-square and Odds Ratio (OR) tests using SPSS.

Result: Univariate analysis showed that the average age of toddler mothers was >35 years, with the last education of elementary school (22.5%), junior high school (45.8%), and high school (31.7%). The gender of toddlers consisted of females (58%) and males (41.7%), with stunting and non-stunting incidents of 50% each. Bivariate analysis showed that environmental sanitation (p-value = 0.000, OR = 3.19) and clean water (p-value = 0.000, OR = 2.66) both had a significant relationship and were risk factors for stunting.

Conclusion: Penelitian ini menyimpulkan bahwa sanitasi dan air bersih berpengaruh signifikan terhadap stunting. Edukasi masyarakat dan peran pemerintah penting untuk menurunkan prevalensi stunting pada balita.

Keywords: Stunting; Enviromental Sanitation; Clean Water;

INTRODUCTION

Toddlers are a group at risk of suffering from malnutrition, one of which is stunting (1). Stunting is a long-term (chronic) nutritional problem in toddlers which is characterized by their height being shorter than children of the same age, so that it can cause developmental disorders in children lower than children of the same age (2).

Stunting is a condition of long-term malnutrition that arises due to a lack of nutritional intake in the past. Prevalence data published by WHO shows that Indonesia is one of the third countries with the highest prevalence of stunting in the Southeast Asia region (3).

The stunting rate in Indonesia, which is a serious nutritional problem, has increased significantly from year to year (4). In 2018, the stunting rate in Indonesia jumped sharply to 30.8% (5). However, the Ministry of Health announced the results of the Indonesian Nutritional Status Survey (SSGI) where the prevalence of stunting in Indonesia fell from 24.4% in 2021 to 21.6% in 2022 (6,7).

Stunting incidents are generally caused by many interrelated factors, among the many factors, the main cause of stunting is generally caused by maternal factors such as poor nutritional status of the mother during pregnancy, a short body, and poor parenting patterns. Especially when giving food to children, it causes the toddler to have a low birth weight (BBLR) (8).

Other factors that cause stunting are infections in the mother, then getting pregnant at an early age can also cause stunting in children and short birth intervals which have a very bad impact on children and mothers, the most basic thing that causes stunting is one of the economic factors of the family. In addition, low economic factors can provide or increase the risk of malnutrition (9).

Stunting is the most serious public health problem faced by Indonesia, especially in Aceh province. Children who experience stunting do not receive adequate nutritional intake. The diet and types of food given to the child do not meet the nutritional needs required by them (10). Aceh Province is one of the provinces with the 5th highest stunting rate in Indonesia. Aceh only managed to reduce the stunting rate in toddlers by 2 points from the previous year in 2021. There are several areas in Aceh province with the highest stunting rates up to Several of these areas include Subulussalam city district, the first rank is around (47.9%) the second position is North Aceh (38.3%) and followed by Pidie Jaya district which is in 3rd position with a prevalence rate (37.8%). Meanwhile, Aceh Jaya district is recorded as the district with the lowest prevalence of stunting toddlers in Aceh province with a prevalence of 19.9% followed by Langsa district with prevalence data of 22.1%, and Sabang district with a prevalence of 23.4% (11).

According to research conducted by Mayasari, Sari and Yulyani, there is a relationship between water quality and the incidence of stunting in the Candipuro Health Center UPT Work Area, South Lampung in 2021 (12).

Based on research conducted by Rahayu, there is an influence of environmental sanitation on the incidence of stunting in toddlers (13).

From the data provided by the Health Center, it can be concluded that around 60 toddlers in Panteraja experience stunting. Around 98% of the Panteraja area has achieved good environmental sanitation standards, indicating a high awareness of maintaining environmental cleanliness. In addition, as many as 35.98% of the Panteraja population has access to clean water (14).

METHOD

This study is a quantitative study with a case control design used to see the risk factors for stunting in toddlers using a 1:1 comparison due to the limited number of toddlers aged 1-5 years in the area. The sample size for case control research aims to find a minimum sample for each case group and control group. Researchers make a comparison between the number of samples of the case and control groups not necessarily 1:1, but can also be 1:2 or 1:3 with the aim of obtaining better results (15).

RESULTS

Based on the research conducted, the result regarding the characteristics of the respondents are as follows.

Table 1. Distribution of Respondent Characteristics

Description	Frequency	Percentage
Mother's Age		
20 – 35 years	36	30%
>35 years	84	70%
Total	**120**	**100%**
Village		
Tu	6	10.0%
Keude	11	18.3%
Hagu	8	13.3%

Muka Blang	5	8.3%
Lhook Puuk	6	10.0%
Mesjid	3	5.0%
Teungoh	4	6.7%
Tunong	1	1.7%
Peurade	5	8.3%
Reudeup	11	18.3%
Total	**60**	**100%**
Mother's Last Education		
Elementary School	27	22.5%
Junior High School	55	45.8%
Senior High School	38	31.7%
Total	**120**	**100%**
Toddler Gender		
Girl	70	58.3%
Boy	50	41.7%
Total	**120**	**100%**
Toddler Age		
1 year	16	13.3%
2 years	40	33.3%
3 years	38	31.7%
4 years	18	15.0%
5 years	8	6.7%
Total	**120**	**100%**
Stunting Incident		
Stunting	60	50.0%
No Stunting	60	50.0%
Total	**120**	**100%**

Based on the table, the average age of mothers is >35 years (70%), the villages with the most stunting in Tu and Reudeup are 11 toddlers (18.3%), mothers with junior high school education are 55 (45.8%), toddlers who are girls are 70 (58.3%), toddlers who are 2 years old are 40 (33.3), the incidence of stunting in toddlers is 60 (50.0%).

Univariate Analysis

Table 2. Distribution of Respondent Based on Univariate Analysis

Description	Frequency	Percentage
Environmental Sanitation		
Qualify	63	52.2%
Not Eligible	57	47.5%
Total	**120**	**100%**
Clean Water		
Qualify	59	49.2%
Not Eligible	61	50.8%
Total	**120**	**100%**

The environmental sanitation variable on the incidence of stunting in toddlers shows that, out of 120 toddlers, 63 met the requirements with a percentage of (52.2%), while 57 environmental sanitation cases did not meet the requirements with a percentage of (47.5%).

The clean water variable on the incidence of stunting in toddlers shows that, out of 120 toddlers, 61 did not meet the requirements with a percentage of (50.8%), while 59 had clean water that met the requirements with a percentage of (49.2%).

Bivariate Analysis

Table 3. Distribution of Respondent Based on Bivariate Analysis

Variable	Stunting Incident				Total		OR CI 95%	*p-value*
	Stunting		No Stunting					
	n	%	n	%	n	%		
Environmental Sanitation								
Qualify	55	45.8%	2	1.7%	57	47.5%	(3,19)	0.000
Not Eligible	5	4.2%	58	48.3%	63	52.5%	59,4 - 1712,9	
Clean Water								
Qualify	57	47.5%	4	3.3%	61	50.8%	(2,66)	0.000
Not Eligible	3	2.5%	56	46.7%	59	49.2%	56,9 – 1242,8	

The statistical table found that the ineligible group had a significantly higher incidence of stunting (45.8%) compared to the eligible group (4.2%). The Odds Ratio (OR) of 3.19 indicates that the likelihood of stunting in the ineligible environmental sanitation group is 3.19 times higher than the eligible group. This result is supported by a very low p-value (0.000), indicating strong statistical significance. Thus, it can be concluded that there is a real relationship between ineligible environmental sanitation and the incidence of stunting.

The statistical table found that the ineligible group had a significantly higher incidence of stunting (50.8%) compared to the eligible group (49.2%). The Odds Ratio (OR) of 2.66 indicates that the likelihood of stunting in the ineligible clean water group is 2.66 times higher than the eligible group. This result is supported by a very low p-value (0.000), indicating strong statistical significance. Thus, it can be concluded that there is a real relationship between ineligible clean water and the incidence of stunting.

DISCUSSION

The Relationship Between Environmental Sanitation and Stunting Incidents in Panteraja Pidie Jaya

Based on the results of statistical tests using Chi-Square, it shows that the p-value is 0.000. These results indicate that Ha is accepted and Ho is rejected because the p-value is <0.05 with an OR value = 3.19 or> 1 so that it can be said that there is a relationship between environmental sanitation and stunting with an OR value showing> 1 which is a risk factor for stunting. Several reasons for stunting involve certain factors, one of which is the lack of environmental sanitation quality. Environmental sanitation includes the health conditions of an area, including housing, waste management, clean water supply, and other aspects.

The results of this study are in line with research conducted by Yani showing that there is a relationship between environmental sanitation and stunting with a P-value of 0.006, but an OR value of 3.59 which indicates a risk factor for environmental sanitation and stunting (16). According to Hasanah, Handayani and Wilti showed a significant relationship between sanitation access and stunting in toddlers. Not having adequate toilet facilities has the potential to cause various infectious diseases, which can inhibit the process of nutrient absorption and disrupt the growth and development of toddlers and there is also a relationship between ownership of healthy toilet facilities and stunting in toddlers (17).

Cleanliness and sanitation in the household can have an impact on stunting. One crucial aspect of sanitation in the household environment is the ownership of a family toilet. Families that have family toilet facilities that meet health standards can reduce the risk of stunting in toddlers. Stunting in young children is not only caused by lack of food intake, but is also related to environmental factors. To prevent stunting, cross-sector cooperation is needed in handling this problem. Inadequate sanitation conditions can trigger stunting and increase the risk of infectious diseases. One step that can be taken in an effort to prevent and break the chain of disease transmission is the provision of healthy toilet facilities. It can be concluded that there is a relationship between environmental sanitation and stunting (18).

The Relationship Between Clean Water and Stunting Incidents in Panteraja Pidie Jaya

Based on the results of statistical tests using Chi-Square, it shows that the p-value is 0.000. These results indicate that Ha is accepted and Ho is rejected because the p-value is <0.05 with an OR value = 2.66 or> 1 so that it can be said that there is a relationship between clean water and stunting with an OR value showing> 1 which is a risk

factor for stunting. Environmental conditions, namely lack of access to clean water facilities and aspects of toilets that do not meet the requirements greatly affect the incidence of stunting. An environment that does not meet health requirements causes transmission of diseases from feces to the mouth, resulting in diseases such as diarrhea, worms, and environmental enteropathy (19).

The results of this study are in accordance with the research conducted by Mayasari, Sari and Yulyani, The results of the statistical test obtained a p-value = 0.005 which means p> α = 0.05 (Ha is accepted and Ho is rejected), so it can be concluded that there is a relationship between water quality and the incidence of stunting in the Candipuro Health Center UPT Work Area, South Lampung in 2021. With an OR value of 4.875, it means that water quality that does not meet the requirements has a 4.875 times greater risk of experiencing stunting when compared to respondents with water quality that meets the requirements. The OR value in this study was 0.008 which means <1 so it can be said that clean water is not a risk factor for stunting (12).

Some evidence findings in Indonesia, have similarities with findings from abroad which reveal that unimproved water increases the incidence of stunting in toddlers. Findings in Ethiopia revealed that drinking water sources are related to the incidence of stunting in toddlers in Ethiopia revealed that consuming water from unimproved sources, has a seven-fold risk of increasing the incidence of stunting in children. Other studies say that unsafe drinking water sources, the distance of the water source from the disposal site, quantity, quality, storage, processing and accessibility of water are related to the incidence of stunting in toddlers. It can be concluded that there is a relationship between clean water and the incidence of stunting (20).

CONCLUSION

The conclusion obtained is that there is a significant relationship between environmental sanitation and access to clean water with the incidence of stunting. Environmental sanitation that does not meet the requirements has a 3.19 times greater risk of causing stunting, while inadequate clean water increases the risk of stunting by 2.66 times. This second factor is an important risk for stunting in the region.

SUGGESTION

It is recommended that the Pidie Jaya District Government increase efforts to improve sanitation in each village, especially in Panteraja District which still lacks access to clean water and provide education to the community who are less concerned about the importance of maintaining environmental sanitation. In addition, the community also needs to be given information about the importance of maintaining environmental cleanliness and learning about good nutrition to prevent stunting in toddlers at an early age.

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