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The Relationship between Environmental Sanitation and Stunting Incidence

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ABSTRACT

Stunting is still a global nutritional problem. One of the factors that influences stunting is environmental sanitation. The purpose of this study was to determine the relationship between environmental sanitation and stunting. This study is a quantitative study with a case-control approach. Data collection in this study was carried out in January-March 2025 in Lembar Selatan Village, West Lombok Regency, as many as 344 people. Respondents in this study were mothers who had toddlers. The sampling technique used total sampling. The independent variable is environmental sanitation consisting of clean water sources, household waste management, water and waste disposal facilities and the dependent variable is stunting. The data collection tool in this study used a questionnaire. Stunting measurement uses height per age. Data analysis in this study includes univariate analysis using percentages and bivariate analysis using the Chi-Square test. The results of the study found that most respondents had poor clean water sources (50.6%), good household waste management (57.3%), poor water and waste disposal facilities (51.7%). The analysis found that most respondents who were not stunted were with good clean water sources (92.4%), good household waste management (65.7%), good water and waste disposal (90.7%). The results showed that there was a relationship between clean water sources (p<0.001), household waste management (p=0.002) and water and waste disposal facillities (p<0.001) with the incidence of stunting.

ABSTRAK

Stunting masih menjadi masalah gizi global. Salah satu faktor yang berpengaruh pada stunting adalah sanitasi lingkungan. Tujuan penelitian ini adalah mengetahui hubungan antara sanitasi lingkungan dengan kejadian stunting. Penelitian ini adalah penelitian kuantitatif dengan pendekatan case-control. Pengambilan data pada penelitian ini dilaksanakan pada bulan Januari-Maret 2025 di Desa Lembar Selatan Kabupaten Lombok Barat sebanyak 344 orang. Responden dalam penelitian ini adalah ibu yang mempunyai balita. Teknik pengambilan sampel menggunakan total sampling. Variabel independen yaitu sanitasi lingkungan yang terdiri dari sumber air bersih, pengelolaan sampah rumah tangga dan sarana pembuangan air dan limbah serta variabel dependen yaitu stunting. Alat pengumpul data dalam penelitian ini menggunakan kuesioner. Pengukuran stunting menggunakan tinggi badan per umur. Analisis data dalam penelitian ini meliputi analisis univariat menggunakan persentase dan analisis bivariat menggunakan uji Chi-Square. Hasil penelitian mendapatkan bahwa sebagian besar responden dengan sumber air bersih yang kurang baik (50,6%), pengelolaan sampah rumah tangga yang baik (57,3%), serta saluran pembuangan air dan limbah yang kurang baik (51,7%). Analisis mendapatkan bahwa sebagian besar responden yang tidak stunting adalah dengan sumber air bersih yang baik (92,4%), pengelolaan sampah rumah tangga yang baik (65,7%) dan saluran pembuangan air dan limbah yang baik (90,7%). Hasil penelitian menunjukkan bahwa ada hubungan sumber air bersih (p<0,001), pengelolaan sampah rumah

tangga (p=0,002) dan saluran pembuangan air dan limbah (p<0,001) dengan kejadian stunting.

A. INTRODUCTION

Stunting is a growth disorder in children caused by chronic malnutrition. This condition is characterized by a child's height being shorter than children of the same age (Azizah et al., 2023). Stunting occurs due to inadequate nutritional intake over a long period of time, especially during the first 1000 days of life. The impact can affect the child's physical and cognitive development in the future. Preventing stunting is very important to ensure a healthy and quality next generation (Arjuan & Tasrun, 2023).

Stunting is still a global nutritional problem. In 2022, WHO data stated that 148.1 million children under 5 years of age were too short for their age or stunting, 45.0 million were too thin for their height or wasting and 37.0 million were too heavy for their height or overweight. In 2023, the stunting rate in Indonesia reached 21.5%, a small decrease from 21.6% in 2022. The government is targeting a reduction in stunting to 14% by the end of 2024, but the figure of 21.5% shows that the target has not been achieved (Hasanah et al., 2021).

Currently, the stunting rate in West Nusa Tenggara is at 24.6 percent in 2023. In order to achieve the target of 14 percent, West Nusa Tenggara must reduce the prevalence of stunting by 10.6 percent in one year. In 2023, the prevalence of stunting in West Lombok was recorded at around 18.9%. However, this figure has decreased significantly from the previous year, which shows that the stunting management program that has been implemented is starting to show results, although it has not achieved the desired sustainability. The prevalence of stunting in West Lombok had spiked in 2022.

Stunting has a serious impact on children, including stunted physical growth (short stature and low weight). Other impacts include decreased intelligence levels and increased susceptibility to disease (Soraya et al., 2022). The World Health Organization adds the risk of death and chronic disease later in life. Prevention and management of stunting are important to support optimal child development and prevent its long-term impacts on health and quality of life (Dellavega et al., 2022).

UNICEF states that stunting is caused by chronic or repeated malnutrition since pregnancy and childhood. Other contributing factors include low maternal weight, anemia in pregnant women, family economic conditions, recurrent illnesses, infections, and poor environmental conditions (Mayasari et al., 2022). Early intervention and improving nutrition in mothers and children are very important to prevent stunting. In addition, another factor that plays a role is environmental sanitation. Environmental sanitation plays an important role in preventing stunting. By increasing access to clean water, adequate toilet facilities, and good waste management, as well as encouraging the implementation of health behavior, we can help create a healthier environment and support optimal child growth (Soamole, 2022).

Poor environmental sanitation has a significant relationship with the incidence of stunting in toddlers. Poor environmental sanitation, such as lack of access to clean water, inadequate toilet facilities, and poor waste management, can increase the risk of infectious diseases such as diarrhea and worms, which then interfere with nutrient absorption and child growth (Nasyidah et al., 2023). Stunting prevention requires improving environmental sanitation.

Poor environmental sanitation quality contributes to increased risk of disease and health problems in children, which exacerbates the risk of stunting (Telan et al., 2022).

Previous studies have found that there is a significant relationship between clean water sources and stunting in Indonesia. Inadequate access to drinking water sources, as well as poor sanitation, are factors that cause high stunting rates (Hidayah et al., 2022). Research shows a strong correlation between the quality of household drinking water sources and the incidence of stunting in infants (Diaz & Ramadhani, 2022). Inadequate drinking water treatment also plays a role. Therefore, the provision of adequate clean water and good sanitation management are very important to prevent stunting (Soeracmad, 2019).

Poor household waste management is correlated with an increased risk of stunting. Poor waste management can be a source of infection and disease, which can affect the nutritional status of children, one of which is causing stunting. If household waste management is good, the possibility of stunting is smaller, this is related to the minimal possibility of toddlers being infected with environmental-based diseases (Rezki, 2021).

There is a relationship between water and waste disposal facilities and the incidence of stunting. Poor water and waste disposal facilities can increase the risk of stunting because it can cause infections that interfere with digestion and nutrient absorption, which are important for child growth (Adriany et al., 2021). Inadequate or poorly maintained water and waste disposal facilities can cause stagnant waste and water which becomes a breeding ground for bacteria and parasites (Lopa et al., 2022).

Research on the effect of environmental sanitation on stunting in Lembar Selatan village has never been conducted, so researchers consider it important to conduct it to explore the effect of environmental sanitation on stunting incidence. Research on the effect of environmental sanitation on stunting has theoretical and practical benefits. Theoretically, this study can enrich knowledge about the relationship between environmental sanitation and stunting incidence, as well as provide learning materials for educational institutions. Practically, this study can be the basis for public health interventions and policies, such as increasing public awareness of the importance of good sanitation to prevent stunting. The results of the study can also be used to identify risk factors for stunting related to sanitation so that more effective preventive measures can be taken. The purpose of this study was to determine the relationship between environmental sanitation and the incidence of stunting in Lembar Selatan Village, West Lombok Regency in 2025.

B. METHODS

This study is a quantitative research type with a case-control approach. Data collection in this study was carried out in January-March 2025 in Lembar Selatan Village, West Lombok Regency, as many as 344 people. Respondents in this study were mothers who had toddlers. The sampling technique used total sampling. The independent variable is environmental sanitation consisting of clean water sources, household waste management, water and disposal facilities and the dependent variable is stunting. The data collection tool in this study used a questionnaire that had been tested for validity and reliability and produced valid (r=0,431-0,786) and reliable questions (Cronbach alpha=0,87). Stunting measurement uses height per age. Data analysis in this study includes univariate analysis using percentages and bivariate analysis using the Chi-Square test.

C. RESULT AND DISCUSSION

1. Result

a. Respondent Characteristics

Table 1. Respondent Characteristics in Lembar Selatan Village, West Lombok Regency in 2025.

Variable	n	%
Age		
20-35 years	216	62.8
>35 years	128	37.2
Education		
No education	56	16.2
Elementary school	153	44.5
Junior/Senior High School	102	29.7
Bachelor	33	9.6
Job		
Housewives	183	53.2
Self-employee	123	35.8
Others	38	11.0
Total	344	100.0

The research results found that most respondents were aged 20-35 years (62.8%), elementary school graduates (44.5%), and housewives (53.2%).

b. Clean Water Sources, Household Waste Management, Water and Waste Disposal Facilities

Table 2. Frequency Distribution Based on Clean Water Sources, Household Waste Management and Water and Waste Disposal Facilities and Stunting in Lembar Selatan Village, West Lombok Regency in 2025.

Variable	n	%
Clean water source		
Good	170	49,4
Poor	174	50,6
Household waste management		
Good	197	57,3
Poor	147	42,7
Water and Waste Disposal Facillities		
Good	166	48,3
Poor	178	51,7
Stunting		
No (≥-2SD)	172	50,0
Yes (<-2SD)	172	50,0
Total	344	100,0

The results of the study found that most respondents had poor clean water sources (50.6%), good household waste management (57.3%), and poor water and waste disposal facillities (51.7%).

c. Relationship Between Clean Water Sources, Household Waste Management, Water and Waste Disposal Facilities with Stunting Incidents

Table 3. Relationship Between Clean Water Sources, Household Waste Management, Water and Waste Disposal Facilities with Stunting Incidents in Lembar Selatan Village, West Lombok Regency in 2025

Variable	Stunting		Total	*p-value*
	No	Yes		
	n (%)	n (%)	n (%)	

Clean water source				
Good	159 (92,4)	11 (6,4)	170 (49,4)	<0,001
Poor	13 (7,6)	161 (93,6)	174 (50,6)	
Household waste management				
Good	113 (65,7)	84 (48,8)	197 (57,3)	0,002
Poor	59 (34,3)	88 (51,2)	147 (42,7)	
Water and Waste Disposal Facillities				
Good	156 (90,7)	10 (5,8)	166 (48,3)	<0,001
Poor	16 (9,3)	162 (94,2)	178 (51,7)	

The results of the analysis found that most respondents who were not stunted were with good clean water sources (92.4%), good household waste management (65.7%), good water and waste disposal facillities (90.7%). The results showed that there was a relationship between clean water sources ($p<0.001$), household waste management ($p=0.002$) and water and waste disposal facillities ($p<0.001$) with the incidence of stunting.

2. Discussion

a. Characteristics of Respondents

The research results found that most respondents were aged 20-35 years (62.8%), elementary school graduates (44.5%), and housewives (53.2%).

The age of the mother can significantly influence her parenting and dietary practices, which in turn affects the incidence of stunting in children. Younger mothers may possess different levels of knowledge and experience in child-rearing compared to their older counterparts. This disparity can impact the way they provide food and attention to their children. Research indicates that maternal characteristics, such as age, are linked to the diets provided to toddlers. The mother's reproductive age, which is often associated with greater experience and knowledge, can indirectly influence parenting styles and toddlers' eating habits. However, further research is necessary to establish a direct relationship between the mother's reproductive age and its effects on toddlers' diets (Junanda et al., 2022).

Maternal education is closely linked to the incidence of stunting, as a mother's educational level significantly influences her ability to manage the household, particularly in terms of the family's dietary habits. Mothers with higher education levels are generally better equipped to understand nutritional information, which enables them to select and prepare nutritious foods that meet their family's dietary needs more effectively than mothers with lower education levels. Insufficient maternal education can adversely impact parenting and childcare practices, as well as the selection and presentation of food for their children. Providing appropriate ingredients and menus for toddlers to enhance their nutritional status is more likely to occur when mothers possess a solid understanding of nutrition. This finding aligns with research conducted by (Oktriyani et al., 2023), which indicated that a mother's educational level regarding nutrition plays a crucial role in the prevalence of stunting. Additionally, economic status, including per capita income, is a contributing factor to stunting in toddlers. Socioeconomic conditions can limit the variety and quantity of food consumed, particularly essential ingredients that support child growth, such as sources of protein, vitamins, and minerals, thereby increasing the risk of malnutrition (Raihani et al., 2023).

b. Clean Water Sources, Household Waste Management, Water and Waste Disposal Facilities

The results of the study found that most respondents had poor clean water sources (50.6%), good household waste management (57.3%), and poor water and waste drainage (51.7%). Clean water is a type of water-based resource that is of good quality and is commonly used by humans for consumption or in carrying out their daily activities, including

sanitation. Access to clean water, sanitation, and cleanliness are the most basic human needs for health and well-being (Oktriyani et al., 2023). The importance of safe drinking water, sanitation, and cleanliness is related to the health of infants, toddlers and the community in general. Sanitation involves technology and behavior that function to safely accommodate waste, prevent human contact, and general cleanliness such as washing hands with soap after defecating and before eating (Raihani et al., 2023).

Effective household waste management includes waste sorting, reducing consumption, reusing goods, and recycling. These steps help reduce the volume of waste disposed of, reduce environmental impacts, and even create economic opportunities (Dhefiana et al., 2023). Waste sorting can be divided into organic waste (food waste, vegetables, fruits, and others), inorganic waste (plastic, paper, glass, and others), and Hazardous and Toxic Materials (B3) (remaining medicines, chemical liquids, and others) (Junanda et al., 2022).

Wastewater disposal facilities are systems designed to collect and channel wastewater from sources such as bathrooms, kitchens, and laundry areas, before finally being treated or disposed of in a safe place. This can be in the form of an open channel (excavated earth channel) or a closed pipe. The function of water and waste disposal facilities includes collecting wastewater from various sources in or around the building. In addition, the collected wastewater is then channeled through the water and waste disposal facilities to the appropriate treatment or disposal site. The water and waste disposal facilities can also function to prevent the spread of disease. A good water and waste disposal facilities can prevent the spread of disease due to uncontrolled wastewater, as well as prevent environmental pollution. A well-maintained water and waste disposal facilities helps prevent environmental pollution by wastewater (Suarayasa et al., 2023).

c. Relationship Between Clean Water Sources, Household Waste Management, Water and Waste Disposal Facilities with Stunting Incidents

The results of the analysis found that most respondents who were not stunted had good clean water sources (92.4%), good household waste management (65.7%) and good water and waste drainage (90.7%). The results of the study showed that there was a relationship between clean water sources ($p<0.001$), household waste management ($p=0.002$) and water and waste drainage ($p<0.001$) with stunting incidents.

Clean water sources are very important in preventing stunting because contaminated water can cause infectious diseases in children. These infections can inhibit growth and cause stunting, a condition in which children are short for their age due to chronic malnutrition (Angraini et al., 2021). Clean water is an important environmental factor in children's health. Unclean water can contain bacteria, viruses, or parasites that cause diseases such as diarrhea, typhus, and other digestive diseases. Stunting occurs when children do not get enough nutrients to support optimal growth, and infections caused by unclean water can contribute to this nutritional deficiency (Mairani et al., 2023).

Clean living behavior, such as washing hands with soap and clean water after touching dirty objects, is very important to prevent infection and maintain children's health, including preventing stunting. In addition to clean water, good sanitation is also very important to prevent the transmission of infectious diseases. Poor sanitation can lead to contamination of water and the environment, increasing the risk of infection in children. Efforts to prevent stunting through the provision of clean water and proper sanitation are part of a broader intervention, which also includes improving maternal and child nutrition, as well as promoting clean and healthy living behaviors (Pradana et al., 2023).

Poor waste management has a significant relationship with stunting in children. Poor environmental sanitation, including improper waste management, can be a source of infection and disease, which results in impaired nutrient absorption and child growth. Poor waste

management can lead to a dirty and unhealthy environment. Open trash bins, scattered garbage, and poorly processed waste can become breeding grounds for disease vectors such as mosquitoes and flies, which can spread diseases such as diarrhea and worms (Ariyanto et al., 2021).

Stunting is a condition in which children have stunted growth due to chronic malnutrition. Poor waste management can be a contributing factor to stunting, as it can cause impaired nutrient absorption and increase the risk of infectious diseases in children. Good waste management is essential to prevent stunting. By maintaining environmental cleanliness, preventing the spread of disease, and ensuring children get adequate nutrition, the risk of stunting in children can be reduced (Nisa et al., 2022).

Poor water and waste disposal facilities have a significant relationship with the incidence of stunting in children. Poor water and waste disposal facilities can be a source of environmentally-based infectious diseases, such as diarrhea and worms, which can interfere with nutrient absorption and cause stunting. The water and waste disposal facilities that is not maintained or does not meet standards (eg, open drains, leaking pipes, no good waste disposal system) can be a breeding ground for dangerous bacteria and parasites. Exposure to bacteria and parasites from poor water and waste disposal facilities can cause infectious diseases such as diarrhea and worms in toddlers. Diarrhea and worms can interfere with the digestive process and nutrient absorption, so that toddlers do not get enough nutrition to grow and develop. Lack of nutritional intake caused by infectious diseases and digestive disorders can cause toddlers to experience stunting, a condition where toddlers have stunted growth, especially in terms of height (Nisa et al., 2022).

Several studies have shown that poor water and waste disposal facilities is associated with an increased risk of stunting. Research shows that there is a significant relationship between the availability of water and waste disposal facilities and the incidence of stunting. Other studies also show that families with unhealthy water and waste disposal facilities have more toddlers who experience stunting compared to families with healthy water and waste disposal facilities. Good water and waste disposal facilities is very important to prevent stunting in toddlers. By ensuring good water and waste disposal facilities, it can prevent environmentally-based infectious diseases that can interfere with digestion and nutrient absorption, so that toddlers can grow and develop optimally (Sasmita et al., 2022).

The limitations of research on the impact of environmental sanitation on stunting yield mixed results. Several studies indicate that environmental sanitation has no significant effect on the incidence of stunting. However, other research emphasizes the critical role of sanitation, particularly the availability of clean water, in preventing stunting. These discrepancies in findings may stem from variations in research methodology, sample size, and local context. Additionally, future research should consider other facets of environmental sanitation beyond just access to clean water, such as waste management and overall environmental cleanliness, to achieve a more comprehensive understanding of the issue.

D. CONCLUSION AND SUGGESTIONS

The results of the study found that most respondents had poor clean water sources, good household waste management, and poor water and waste drainage. The analysis found that most respondents who were not stunted had good clean water sources, good household waste management and good water and waste disposal facillities. The results of the study showed that there was a relationship between clean water sources, household waste management and water and wastewater drainage with the incidence of stunting. Research on the effects of environmental sanitation on stunting should concentrate on the direct relationship between household sanitation conditions and stunting in children. Theoretically, it is essential to review the extensive literature on how poor sanitation—such as limited access to clean water

and inadequate waste management—can increase the risk of infection and impair nutrient absorption, thereby contributing to stunting. Practically, studies should be designed to collect comprehensive data on household sanitation practices and children's nutritional status. Employ non-experimental methods to assess the relationship between environmental sanitation and stunting, while considering other factors that may influence the results. It is crucial to conduct thorough data analysis.

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