RESEARCH ARTICLE **Open Access**

Gema Lingkungan Kesehatan
Vol. 23, No. 2 (2025), pp 244-250
e-ISSN 2407-8948 p-ISSN 16933761
Doi: https://doi.org/10.36568/gelinkes.v23i2.215 *Journal Hompage: https://gelinkes.poltekkesdepkes-sby.ac.id/*

The Impact of Parenting Patterns, Waste Management, and Sanitation Facilities on Stunting

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ABSTRACT

Indonesia is still facing serious nutritional problems, with stunting being a major problem that has a significant impact on children's physical and cognitive development. This research aims to identify the influence of parenting patterns, waste management, and sanitation facilities. Sanitation facilities regarding stunting incidents in Wonoasri Village, Tempurejo District, Jember Regency. Methodology used is quantitative analytical correlation research with a cross-sectional study approach. Samples are taken sequentially or successively from the population over a certain period until the desired sample size is reached; the period for this research is one month. Data were analyzed using the Chi-Square statistical test for bivariate analysis and ordinal logistic regression for multivariate analysis. The results of the bivariate analysis showed that the highest incidence of stunting was very short, with 81 cases (62%). Statistically, there is a significant correlation between parenting style with p value=0.017, waste management p value=0.000, and sanitation facilities p value=0.017 with the incidence of stunting. Multivariate analysis shows that waste management significantly negatively influences nutritional status, with p value of 0.000 and OR 29.168; sanitation facililities OR 3.823; and parenting OR 1.926. These results indicate that the prevalence of stunting is strongly influenced by inadequate waste management and reduces the possibility of better nutritional status. Local government efforts to reduce stunting prevalnces rates by improving sanitation with the community-based total sanitation program, because stunting problem is caused by multifactorial so the role of the community is very important.

Keywords: Sanitation facilities, Waste management, Parenting patterns, Stunting

INTRODUCTION

Indonesia still faces nutritional problems, with stunting being the main problem (Hasanah et al., 2021). Even though there has been some progress, Indonesia still experiences the problem of high rates of malnutrition in children (UNICEF Indonesia, 2022). Stunting is a condition where growth is hampered in children, especially in fetuses and children (Nuzula et al., 2021). Stunting inhibits children's physical growth and cognitive development, which has a negative impact on their IQ and future productivity (Kementerian Sekretariat Negara Republik Indonesia, 2020).

The world stunting situation, as described in findings by WHO, UNICEF, and the World Bank Group, shows that as many as 148.1 million, or 22.1% of all children under five worldwide, will experience stunting in 2022 (WHO, Unicef, 2023). The prevalence of stunting in Indonesia has decreased by 2.8%; the prevalence of stunting shows that the percentage of stunted toddlers in 2022 is 21.6%; this percentage has decreased compared to the previous year in 2021, namely 24.4% and findings from Java Province Indonesian Nutrition Status Survey (SSGI). In 2022, East Java experienced a decline of 4.3%, and the prevalence of stunting was 19.2%, down from 23.5% the previous year and below the national average (Kementrian Kesehatan RI, 2023). Jember Regency showed a stunting prevalence of 34.9% in 2022, an increase of 11% compared to the previous year of 23.9% (Dinas Kominfo Provinsi Jawa Timur, 2023). There were 236 cases of stunting in the Tempurejo District, Wonoasri Village (Jember Health Office, 2023). The percentage of stunting prevalence still has yet to reach the national target of 14% in 2024 (Menteri Kesehatan Republik Indonesia, 2020).

A number of factors, both direct and indirect, can cause stunting. These indirect factors include waste management, latrine ownership, drinking water sources, and maternal nutrition during pregnancy. Other indirect factors include infectious diseases and toddler nutrition (Hasanah et al., 2021). Insufficient or bad parenting patterns can also cause stunting, mothers' lack of knowledge about how to meet their nutritional needs during pregnancy, and even nutritional preparations that must be met when ed out for pregnancy (Noorhasanah, 2021). The parenting practices carried out in the household include providing appropriate nutrition for children that can meet nutritional needs to improve their growth and development optimally (Nuzula & Oktaviana,

2024). Inadequate waste management practices can have a negative impact on the environment and humans (Azizah, 2023). Many people in rural areas live near rivers. Urinating in inappropriate places in the yard, river, or other places and engaging in unhealthy behavior (Simanihuruk et al., 2023). There are still villages/subdistricts that practice Open Defecation (ODF). One hundred twenty-six villages in the Jember Regency have achieved ODF, with a percentage of 51.6%, and there are no villages with Community-Based Total Sanitation (STBM) status. However, the number of villages that achieve ODF is still less than 80%, so they are not worthy of being considered a Healthy Regency/City (Dinkes Jember, 2023).

Cleanliness has a direct impact on people's lifestyle, health, environment, and daily comfort, being essential for promoting collective well-being (Anwar et al., 2023). Community empowerment and education programs can increase awareness of the value of good parenting, waste management procedures, and excellent sanitation (Noorhasanah, 2021). Increasing access to clean water, hygienic conditions, and proper toilet facilities is one strategy to reduce the risk of infection and disease that can cause stunting. A healthier environment can be achieved through community-wide personal hygiene campaigns and investment in sanitation infrastructure (UNICEF Indonesia, 2022).

METHODS

This research study uses a quantitative correlation analysis methodology; the research independent variables are parenting patterns, waste management, and sanitation facilities, and the dependent variable is the incidence of stunting. Univariate analysis uses descriptive statistics. The Chi-Square test was used in bivariate analysis, and the ordinal logistic regression test was used for multivariate analysis. June 2024 is the month the research will be carried out. Sampling was taken using the Consecutive Sampling technique with samples that met the inclusion criteria, prioritizing densely populated areas, namely mothers of toddlers living in the Curahnongko Health Center area who were ready to participate as respondents after receiving an explanation of the research protocol and parents who had children aged between 0 and 5 years, they signed a consent form. Toddlers who are not under the care of their parents and mothers of toddlers who do not fill out the questionnaire are exclusion criteria. After attending posyandu in the Curahnongko Community Health Center area, data was collected by participating in the posyandu program for four weeks and visiting the homes of mothers of toddlers directly for parents or children who did not attend posyandu with the assistance of posyandu cadres. In accordance with the inclusion and exclusion criteria, the sample was selected from the Curahnongko Health Center toddler data. This technique has a bias where there number of samples taken is not evenly distributed in each region because it prioritizes densely populated areas. The questionnaire used in the study used EHRA (Environmental Health Risk Assessment) with validitas value is <0.001 and a Cronbach alpha value is 0.85. Bivariate analaysis test using chi-square because the number of variables is more than two with ordinal and nominal categorical scale and multivariates analysis using logistic regression test because both independent and dependent variables are on a categorical scale. This research has passed the ethical feasibility test with certificate number:269/03/KEPK-STIKESBWI/VII/2024.

RESULTS AND DISCUSSION

Characteristics of Research Respondents

Table 1.
Frequency Distribution of Respondent Characteristic

Respondents Characteristics	f	%
Gender:		
Female	67	51.54
Male	63	48.46
Child Age:		
Baby	10	7.69
Toddler	13	10
Pree school	107	82.31
Income:		
<UMR	37	28.46
>UMR	93	71.54

Gender, child's age and parental income influence the incidence of stunting in children, males have a greater chance of experiencing malnutrition than females, pre-school age has a higher rate of stunting than other children and low parental income makes things that worsen nutritional problems in children (Khura et al., 2023). Research in Ethiopia found that male and female have the save number of experiencing stunting while the most common age group is pre-school age reaching up to 60.7% (Fufa & Laloto, 2021). The results of the research found several differences with previous research, where researchers found that 51.54% females with had stunting than male 48.46%, age obtained the same results as other research, namely 82,31% of children who experienced stunting were at pre-school age and parental income above the minimum wage actually experienced more stunting up to 71.54%.

The Relationship between Parenting Patterns Waste Management and Sanitation Facilities on Stunting

The data distribution shows significant differences in nutritional status between children raised with democratic and authoritarian parenting styles. 45.38% children raised with a democratic parenting style had very short nutritional status, two children had short nutritional status and Chi-Square test results show a p-value of 0.017.

Table 2.
Frequency Distribution of Independent Variables the Impact of Parenting Patterns, Waste Management and Sanitation Facilities on Stunting

Variable	***Stunting***						**Amount**		**P value**
	Very short		Short		Normal				
	N	f	N	f	N	f	N	f	
Parenting:									
Authoritarian	22	16.92	1	0.76	3	2.30	26	20%	0.017
Democratic	59	45.38	2	1.54	43	33.07	104	80%	
Waste Management:									
Good	2	1.53	0	0	32	24.61	34	26%	0.000
Bad	79	60.77	3	2.30	14	10.77	96	74%	
Sanitation Facilities:									
Good	49	37.69	2	1.54	39	30	90	69%	0.017
Bad	32	24.61	1	0.77	7	5.38	40	31%	

Poor waste management affects the incidence of stunting, namely 60.77% are very short with p-value for the Chi-Square test is 0.000. Poor sanitation facilities affects the incidence of stunting, 24.61% are very short, while for good sanitation facilities, it is 37.69% are very short with P-value for the Chi-Square test analysis is 0.017. The importance of managing sanitation and cleanliness is known to be related to public health, especially children's health. For this reason, efforts to improve sanitation conditions are very important where this is related to technologies and behaviours that serve to safely contain excreta, preventing human contact and hygiene is commonly used to mean washing with soap at critical times (Cumming & Cairncross, 2016).

According to the findings, 104 respondents practiced democratic parenting, while 26 out of 130 respondents practiced authoritarian parenting. Authoritarian parenting tends to emphasize strict control from parents (Aslam & Hardiansyah, 2024). On the other hand, a harsh disciplinary approach in authoritarian parenting can hinder the development of children's communication skills because they are not given the opportunity to express their feelings and opinions freely (Chen, 2023). Parenting styles have an important role in determining children's nutritional status and health (Nuzula & Sayektiningsih, 2019). Democratic parenting that supports and involves children can reduce stunting by ensuring good nutritional intake, emotional support, and quick access to health care. Conversely, authoritarian parenting can increase the risk of stunting through inadequate nutritional intake, psychological pressure, and lack of response to children's health needs. Therefore, encouraging more responsive and supportive parenting can be an important strategy for reducing the incidence of stunting in children.

Poor waste management has a major impact on children's health (Braun et al., 2024). Poor sanitation, including inadequate waste handling, can result in exposure to various pathogens and toxins (Mariana et al., 2021). Environments with poor sanitation provide ideal conditions for the growth of pathogenic microorganisms, which can cause various infectious diseases such as diarrhea, worm infections, and skin problems (WHO, Unicef, 2023). Good waste management, as well as every stage of production, storage, transportation, and disposal of waste, can minimize negative impacts on human health and the environment (Avarand et al., 2023). Poor waste handling increases the risk of infection and disease, which can stunt children's growth. Inadequate sanitary conditions create an environment that favors the development of pathogens and the spread of disease. Pathogens have the potential to contaminate the surrounding environment, including water and soil, which children can ultimately access through direct contact or consumption of contaminated food and drink.

Poor sanitation conditions have the potential to increase the risk of infection and disease and reflect broader problems in environmental sanitation and hygiene (UNICEF Indonesia, 2022). According to Bronfenbrenner's ecological theory, environmental factors such as sanitation influence children's health and development. An unhealthy environment can hinder children's physical and mental growth (Crawford, 2020). Effective sanitation policies and practices influence community health. Adequate and well-maintained toilets are an important part of the public health infrastructure that supports disease prevention (Greenberg, 2019). Sanitation facilities conditions have a significant impact on stunting incidence. Poor sanitation can increase the risk of stunting through increased exposure to pathogens and infections. On the other hand, good toilet facilities

and well-maintained sanitation, including practices such as regular hand washing, use of clean latrines, and access to clean water, can prevent stunting by supporting optimal health and growth. Therefore, improvements in MCK management, increased sanitation, and implementation of good Sanitation facilities practices are crucial steps to reduce the risk of stunting and support children's well-being.

Chi-square test analysis shows a p-value of 0.017, which shows that there is a statistically significant relationship between stunting and parenting styles. These results are consistent with research conducted by (UNICEF Indonesia, 2022), showing a correlation between parenting patterns and the incidence of stunting. Democratic parenting, although more commonly applied, shows differences in children's nutritional status compared to authoritarian parenting. This may reflect that although democratic parenting encourages children's participation in decision-making, other factors, such as providing proper nutrition and emotional support, also influence children's nutritional status (Rosmeilani et al., 2023). However, the results of this study are partially in line with the findings (Sari & Rahmi, 2019). In this study, it is explained that there is no relationship because the respondents in the study were more dominant in democratic parenting with nine respondents; 16 respondents were stunted, not stunted, and authoritarian; two respondents were stunted, and one was not stunted. Children's participation in decision-making, such as discussions about the importance of consuming nutritious foods and menu planning, can contribute to better eating habits and reduce stunting caused by malnutrition (Crowell et al., 2019).

At a significance level of 0.005, the Chi-Square test findings with a p-value of 0.000 prove that there is a substantial correlation between waste management and stunting. This is consistent with research results (Junanda et al., 2022), indicating a correlation between stunting and waste disposal. The research explains that poor waste management can be a vector for the spread of disease, increasing the risk of infection and disrupting children's health. This condition affects children's nutritional absorption and growth, which ultimately contributes to stunting. Different from the findings (Sari, Saputra, 2024). There is no correlation between waste management and the incidence of stunting. It can be concluded that the impact of an unhealthy environment can be reduced with effective parenting so that stunting can be prevented even though waste management is less than optimal. They argue that although sanitation does not directly affect stunting, good parenting can help prevent stunting in children.

At a significance level of 0.005, the Chi-Square test results show a p-value of 0.017, which indicates a strong correlation between MCK and stunting. The conclusions of this research are in line with research conducted by (Anwar et al., 2023), showing that toilet conditions have a significant impact on the incidence of stunting. Their research found that unhealthy latrines can be a medium for transferring germs from feces, which can spread through a number of intermediaries, including soil, food, vegetables, hands, water, and insects. This contamination has the potential to increase the risk of infection, which in turn can disrupt children's health and contribute to stunting. However, the results of this study differ from the study conducted by (Braun et al., 2024). In his research, it was explained that there was no significant correlation with the incidence of stunting in low-income environments in Maputo, Mozambique. The research shows that other factors, such as environmental cleanliness and sanitation habits in the household, have more influence on the incidence of stunting than the availability of latrines themselves. These findings underline the importance of considering various aspects of household sanitation and hygiene in the context of stunting prevention.

Multivariate Ordinal Logistic Regression Analysis of Parenting Patterns, Waste Management, and Sanitation Facilities on Stunting Incidents

Table 3.
Multivariate Ordinal Logistic Regression Analysis Results

Variables	OR	Sig.
Parenting	1.929	.165
Waste management	29.168	.000
Sanitation facilities	3.823	.364

The analysis shows that the sanitation facilities variable has a Sig. 0.364, and the OR is 3.823. The parenting pattern variable has a value of Sig. 0.165, and the OR is 1.929. The waste management variable shows Sig. 0.000, and the OR is 29.168. These results indicate that the existence of sanitation facilities is strong enough to impact children's nutritional status, while parenting patterns themselves show that the parenting patterns provided by parents do not necessarily have a direct effect on children's nutritional status. The waste management variable shows that poor waste management has a significant negative influence on children's nutritional status. The results of the ordinal logistic regression analysis in this study show that waste management has a very significant negative influence on the log odds of children's nutritional status, having a OR value of 29.168 and a Significance (Sig.) value of 0.000. These findings are in line with research results (Braun et al., 2024), revealing a correlation between waste management and stunting incidents. According to the findings, poor waste management can increase stunting by acting as a conduit for the spread of disease throughout families and communities. However, the results of this study differ from the study (Sari, Saputra, 2024), which did not find a significant correlation. Their research suggests that other factors, such as good parenting, may have a greater influence on the incidence of stunting than environmental sanitation.

Household waste management involves the principles of reduction, reuse, and recycling (Mariana et al., 2021). A polluted environment resulting from inadequate waste management increases children's exposure to disease-causing agents, which can worsen stunting (Junanda et al., 2022). Effective waste management is an important aspect of maintaining public health and the environment. This research confirms that waste management is the most dominant factor influencing the incidence of stunting, more significant than the influence of toilet facilities or parenting patterns. Waste that is not managed properly can be a major source of the spread of pathogens. Rotting organic waste can attract disease vectors such as flies, mice, and cockroaches, which spread bacteria, viruses, and parasites into the surrounding environment. These pathogens can contaminate water, soil, and air, causing a wider spread of infectious diseases and having a direct impact on children's nutritional status. This condition has a greater impact than the direct effect of inadequate toilet facilities or non-ideal parenting patterns.

Sanitation is closely related to children's health problems. Poor sanitation affects children's susceptibility to infectious disease expereriencied by children occurs repeatedly, made nutritional problems that will affect their growth and development (Braun et al., 2024)(Junanda et al., 2022). Waste management is an indirect in the incidence of stunting, but if waste management in households and surrounding the environment is not good there will be a risk of breeding disease germs. Improper waste management is the cause of the spreading of disease vectors to families and surrounding community. Poor waste management has a direct impact on environmental health and children's health status by increasing the risk of infection, malnutrition and chronic inflammation which inhibits children's growth. Even though good parenting and nutrious food are available, but if environment is full of rubbish and poor sanitation children can still experience growth problems because they are often sick. Parents with a democratic parenting style usually more flexible to get new information, including from social media or surrounding it. If the information that they're received is wrong for example about dietary trends that are not suitable for children, it can cause an impact on the children's nutritional needs. Poor parenting patterns (such as a lack of understanding about nutrition) influence children's food choices and eating patterns, but the influence is indirect. But if parent continues to provide nutritious food, even though their parenting style is not ideal the risk of stunting can be reduced. In a democratic parenting style, parents often negotiate with their children, if they are refuses to eat a healthy food, parents which strictless may tend to replace the food that child likes even though unnutritious food.

CONCLUSIONS

The results of this study show a relationship between parenting patterns and the incidence of stunting. The Chi-Square test results show a significant relationship between parenting patterns and stunting (p-value = 0.017), but logistic regression analysis shows that parenting patterns do not have a significant influence on children's nutritional status (p-value = 0.165). This indicates that although parenting affects stunting, its effect is not strong enough to affect children's nutritional status in this model directly. Other factors may be more dominant in influencing children's nutritional status. There is a significant relationship between waste management and stunting, based on the results of the Chi-Square test (p-value = 0.000). According to logistic regression analysis, children's nutritional status is significantly influenced by inadequate waste management (p-value = 0.000). This shows that inadequate waste management can significantly increase stunting and other nutritional problems in children. Chi-Square test results show a significant relationship between sanitation facilities and the incidence of stunting; however, logistic regression analysis shows that the presence of sanitation facilities does not have a significant effect on children's nutritional status (p-value = 0.364). This shows that although toilet facilities are available, this factor does not directly influence the nutritional status of children in the research location.

From the results of the analysis, waste management emerged as the most dominant factor influencing the incidence of stunting. Poor waste management significantly reduces the likelihood of better nutritional status and increases stunting. This shows that environmental factors such as waste management have a greater impact than other factors, such as parenting patterns and sanitation facilities, in influencing children's nutritional status. the local government needs to supervise waste management in this area, because in most rural areas the waste management is not managed well because ther throw rubbish in their yards, so there needs to be firm action on waste management. The limitation of this research is that not all stunted children were respondents because some areas were difficult to reach. For further research, it would be best to follow parenting patterns and other factors from time of conception until at least their reach a toddler.

SUGGESTION

Respondents are expected to increase awareness regarding the importance of good waste management and healthy parenting patterns. Education and information about the impact of waste management and parenting on children's health can help them adopt better practices. Respondents are advised to report problems related to waste management and MCK facilities to the authorities so that these problems can be handled quickly and effectively.

The local government needs to improve waste management infrastructure and toilet facilities to ensure that these facilities function well and are accessible to the entire community. Apart from that, the government must organize educational programs about healthy parenting,

waste management, and the importance of good sanitation for the community.

Further research needs to be carried out to explore other factors that may influence children's nutritional status. Futur research could involve in-depth analysis of economic aspects, access to nutritious food, and other health factors to provide a more comprehensive picture of the causes of stunting. To overcome the problem of waste management in the working area of the Curahnongko Health center, cooperation between the local government and the local community is needed, namely by empowering youth in the area to manage waste by creating a awaste bak or managing it into useful household materials.

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