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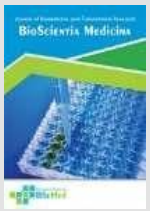

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The Relationship between Basic Sanitation of Healthy Homes and Personal Household Hygiene with the Incidence of Stunting in Toddlers in Residential Area around TPA Cipeucang in 2023

Prima Gita Pradapaningrum[1*], Haryoto Kusnoputranto[1]

[1]Public Health Study Program, Faculty of Public Health, Universitas Indonesia, Jakarta, Indonesia

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***Corresponding author:**
Prima Gita Pradapaningrum

E-mail address:
primagitapr@gmail.com

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A B S T R A C T

Background: Stunting is one of the problems of malnutrition in toddlers in Indonesia. Environmental sanitation has an important role in stunting. Waste management that has not been maximized at the TPA can cause environmental sanitation pollution and a lack of clean living behavior. Cipeucang TPA is the only TPA for the South Tangerang area, with 2 Sub-Districts that are close to the TPA experiencing an increase in stunting cases in 2021-2022. This study aimed to determine the relationship between basic sanitation in a healthy home and personal hygiene households with the incidence of stunting in toddlers in the residential area around TPA Cipeucang. **Methods:** This type of research is observational analytic through a cross-sectional approach. The study population was all toddlers in settlements around the TPA covering 2 Sub-Districts with 4 RT and 2 RW. The research sample was 86 using a purposive sampling technique. The research was conducted from April to June 2023. Data analysis used univariate, bivariate (Chi-square test), and multivariate (logistic regression test). **Results:** The results showed that there was a relationship between drinking water facilities and stunting (p=0.05, POR=1.89), and became the dominant factor causing stunting (p=0.054). While clean water facilities (p=0.374, POR=1.44), latrines (p=0.613, POR=1.22), wastewater disposal facilities (p=1.000, POR=1.54), skin hygiene (p =1.000, POR=1.24) and hand and nail hygiene (p=0.625, POR=1.22) were not related to stunting but were risk factors for stunting. Waste management facilities (p=0.310) have no relationship with stunting and are not a risk factor. **Conclusion:** There is a relationship between drinking water facilities and the incidence of stunting in toddlers in the residential area around TPA Cipeucang.

1. Introduction

Stunting is a nutritional problem that is quite complex globally and still gets major attention, especially in poor and developing countries. Stunting is a condition of failure to thrive in children aged 0 to 59 months caused by chronic malnutrition and repeated infections, especially in the first 1,000 days of life (HPK). Children are said to be stunted if their length or height is below minus two standard deviations from the average length/height of children of their age according to WHO standards. Stunting can be caused by several factors, either directly or indirectly. Sanitation is one of the indirect causes of stunting cases. This is in line with research, which states that there is a relationship between sanitation and stunting. Poor sanitation can lead to recurrent infectious diseases in children under five, such as diarrhea and intestinal worms, which can interfere with the absorption of nutrients for growth and turn into the body's resistance to infection. Repeated infectious diseases for a long time can cause the

baby's weight to drop drastically and cause the child to become stunted.[1-3]

Globally, the stunting rate decreased to 144 million (22%) in 2019. Asia is the region with the highest prevalence of stunting under five, with a prevalence of 55% in 2017. The highest proportion came from the South Asia region (58.7%) and followed by Southeast Asia (14.9%). Indonesia occupies the third position of the country with the highest prevalence of stunting under five (36.7%) in Southeast Asia after Timor Leste and Laos. Banten is one of the 12 priority provinces which has the highest prevalence of stunting in Indonesia (20%) for 2021-2022. South Tangerang, Serpong Sub-District, and Kademangan Sub-District have been designated as one the priority loci for handling stunting due to an increase in the prevalence of stunting in 2022 to 19.9%. TPA (Final Disposal Site) is a place for processing waste safely so as not to cause environmental pollution. The community around the TPA is a group that is vulnerable to the risks of various diseases, including stunting. The amount of garbage that has piled up and waste management that has not been maximized can lead to pollution of environmental sanitation, the emergence of infectious diseases, and a lack of clean living behavior. Cipeucang TPA is the only TPA location for the entire area in South Tangerang. In addition, the location of the Cipeucang TPA is only 50 meters from residential areas. Settlements located at the Cipeucang TPA include Serpong Sub-District and Kademangan Sub-District, which will experience an increase in the prevalence of stunting in 2022.[4-7] This study aimed to determine the relationship between basic sanitation in a healthy home and personal hygiene households with the incidence of stunting in toddlers in the residential area around TPA Cipeucang in 2023.

2. Methods

This study was an analytic observational study with a cross-sectional approach and used primary data obtained from observation and interviews subject study. A total of 86 research subjects participated in this study, where the research subjects met the inclusion criteria. The inclusion criteria in this study were subjects who lived around a 50-meter radius of the TPA Cipeucang and were willing to participate in this study which was marked with a signed research respondent consent sheet. This research was conducted from April to June 2023. The sampling technique used was purposive sampling.

The independent variables in this study are basic sanitation for healthy homes (drinking water facilities, clean water facilities, toilet facilities, household solid waste management facilities, liquid waste management facilities) and personal hygiene (cleanliness of the skin, cleanliness of nails and hands). While the dependent variable is the incidence of stunting in toddlers. This study uses univariable analysis to describe variables descriptively, bivariable analysis by conducting the Chi-square test to analyze the relationship between variables, and multivariable analysis by conducting a Logistic Regression Test to see which variable is the most dominant risk factor for stunting, with a p-value <0.05.

3. Results

An overview of stunting cases in the residential area around the TPA Cipeucang in 2023 contained in this study can be seen in Table 1. Based on Table 1, it can be seen that toddlers experience stunting in settlements around. There were 26 people (30.23%) at TPA Cipeucang and 60 people (69.77%) who were not stunted.

Based on Table 2, environmental health using a questionnaire and observation sheet shows the scoring criteria. If there are 2 variables that are not fulfilled, then it is said that it does not meet the requirements. Some respondents have drinking water facilities that meet the requirements of as many as 62 people (72.09%). In the clean water facility variable, there were 64 people who did not meet the requirements (74.42%). For the toilet facility

variable, most of the respondents did not meet the requirements of 63 people (73.26%). In the variable means of management of solid waste, the majority of respondents did not meet the requirements of as many as 82 people (95.35%). Meanwhile, in the wastewater disposal facilities variable, there were 81 people (94.19%) respondents who did not meet the requirements.

Table 1. Frequency distribution of stunting incidents.

Incidence of stunting	**n (Total)**	**Percentage (%)**
Stunting	26	30,23
Not stunting	60	69,77
Total	86	100,0

Table 2. Frequency distribution of basic healthy home sanitation facilities.

Distribution of basic sanitation facilities	**n (Total)**	**Percentage (%)**
Drinking water facilities		
Disqualify	24	27,91
Qualify	62	72,09
Clean water facilities		
Disqualify	64	74,42
Qualify	22	25,58
Toilet facilities		
Disqualify	63	73,26
Qualify	23	26,74
Solid waste management facility		
Disqualify	82	95,35
Qualify	4	4,65
Waste water disposal facility		
Disqualify	81	94,19
Qualify	5	5,81

Table 3. Personal frequency distribution hygiene household.

Distribution of personal hygiene	**n (Total)**	**Percentage (%)**
Skin hygiene		
Poor	74	86,05
Good	12	13,95
Nail and hand hygiene		
Poor	14	16,28
Good	72	83,72

Based on Table 3, household personal hygiene seen from skin hygiene, there were still 74 respondents (86.05%) who had poor skin hygiene. Meanwhile, in terms of nails and hand hygiene, the majority of residents, as many as 72 respondents (83.72%), already have good personal hygiene.

Based on Table 4 below, it can be seen that there is a significant relationship between drinking water facilities and the incidence of stunting (p value=

0.05). Drinking water facilities that do not meet the requirements are at risk of experiencing stunting 1.89 times compared to drinking water facilities that meet the requirements (POR=1.89). There is no relationship between clean water facilities and the incidence of stunting (p value= 0.374). Clean water facilities that do not meet the requirements are at risk of experiencing stunting 1.44 times compared to clean water facilities that meet the requirements (POR=1.44). There is no relationship between toilet facilities and the incidence of stunting (p value= 0.613). Toilet facilities that do not meet the requirements are at risk of experiencing stunting 1.22 times compared to clean water facilities that meet the requirements (POR=1.22). There is no relationship between waste management facilities and the incidence of stunting (p value= 0.310). The POR value cannot be defined because there is a value of 0 in one of the categories, which causes the results of the POR value statistically not to produce data. There is no relationship between wastewater disposal facilities and the incidence of stunting (p value= 1,000). Wastewater disposal facilities that do not meet the requirements are at risk of experiencing stunting 1.54 times compared to wastewater treatment facilities that meet the requirements (POR=1.54).

Meanwhile, according to Table 5, there is no relationship between personal hygiene and stunting (p value=1,000). Poor skin hygiene is at risk of stunting 1.24 times compared to good skin hygiene (POR=1.24). There is no relationship between the hygiene of nails and hands with the incidence of stunting (p value= 0.625). Poor hand and nail hygiene are at risk of experiencing stunting 1.22 times compared to good hand and nail hygiene (POR=1.22).

For multivariate analysis results in Table 6, the results of the final multivariable analysis model show that drinking water facilities have a relationship mean with the incidence of stunting (p = 0.05) and are the dominant factor influencing the incidence of stunting in settlements around the TPA Cipeucang with a value of Std. The large error of the estimate = 0.51.

Table 4. Relationship between basic healthy home sanitation and stunting incidents.

Basic sanitation facility	**Category**	**Stunting**		**Not stunting**		**POR**	**p-value**
		N	**%**	**N**	**%**	**(95% CI)**	
Drinking water facilities	Disqualify	11	45,83	13	54,17	1,89	0,050
	Qualify	15	24,19	47	75,81	1,02-3,52	
Clean water facilities	Disqualify	21	32,81	43	67,19	1,44	0,374
	Qualify	5	22,73	17	77,27	0,62-3,37	
Toilet facilities	Disqualify	20	31,75	43	68,25	1,22	0,613
	Qualify	6	26,09	17	73,91	0,56-2,65	
Solid waste management facility	Disqualify	26	31,71	56	68,29		0,310
	Qualify	0	0,00	4	100,00		
Wastewater management facility	Disqualify	25	30,86	56	69,14	1,54	1,000
	Qualify	1	20,00	4	80,00	0,26-9,18	

Table 5. Relationship between personal hygiene and stunting incidents.

Personal hygiene	Category	Stunting		Not stunting		POR	p-value
		N	%	N	%	(95% CI)	
Skin hygiene	Poor	23	31,08	51	68,92	1,24	1,000
	Good	3	25,00	9	75,00	0,44-3,51	
Nail and hand hygiene	Poor	5	35,71	9	64,29	1,22	0,625
	Good	21	29,17	51	70,83	0,56-2,70	

Table 6. The final model of multivariable analysis of the relationship of basic sanitation and personal hygiene to stunting incidents.

Variable	S.E.	p-value	POR	95% CI
Drinking water facilities	0,51	0,054	0,377	10,140-1,016

4. Discussion

There is a relationship between drinking water facilities and the incidence of stunting because many respondents use unprotected water sources such as drilled wells (26.74%), unprotected dug wells (13.95%), and pumping wells (2.33%). Drinking water facilities that fall into the unprotected category are water originating from surface water, river water, rainwater reservoirs, and wells, both pumping wells, drilled wells, and unprotected wells. Meanwhile, drinking water facilities that fall into the protected category come from bottled water, PDAM water, and branded refill water. It is necessary to carry out monitoring efforts so that can maintain dug well conditions suitable for consumption based on the level of risk of contamination. Wells with a high level of risk can be repaired in construction, while well with a moderate level of risk can be carried out by taking samples and examining samples of bacteriological, physical, and chemical quality.[8,9]

For the clean water facility variable, the results of this study are in line with other studies that state that there is no relationship between clean water sources and the incidence of stunting with p=0.2321. In addition, other studies state that clean water sources are not related to stunting, with p = 0.46. Both of these studies were cross-sectional in nature and did not assess and test the relationship between sanitation facilities and the incidence of stunting whole however, each component of the sanitation facility is broken down and tested separately. Other studies have shown that families who do not own access to clean water are 3 times more likely to experience stunting if compared to families who have good access to clean water.[10,11]

Based on the results of data analysis, it was found that the majority of residents had clean water facilities that did not meet the requirements of 64 respondents (74.42%). This can be obtained from the source of clean water where there are residents who still use unprotected dug wells (19.77%). Clean water sources that meet the requirements include PDAM water, protected springs or wells, drilled wells or pumps with a minimum distance of 10 meters from the waste disposal site, disposal waste, and dirt. Meanwhile, unprotected water sources come from water sold through tanks and water from unprotected wells and springs. For the latrine facility variable, this is in line with other studies which state that children from inappropriate types of latrines have a 1.3 times greater risk of suffering from stunting than children from families with proper types of latrines. Other studies have shown that toddlers who live in homes with latrines that do not meet the requirements have a 0.3 times higher risk of experiencing stunting than toddlers who live in homes with latrines that meet the requirements. This research is also in line with other studies, which state that there is no significant relationship between latrine ownership and stunting under-fives aged 24-59 months.[12]

From the health aspect, the problem of disposing of feces or human excrement is a fundamental and complex problem that needs to be addressed as early as possible. Because human excrement or excrement can have a big role and be a source of disease transmission, the spread of diseases originating from feces can be through various ways. Feces can contaminate food, drink, water, soil, insects, and human body parts directly. Human excrement is all objects or substances that are no longer used by the body and must be removed from the body. Things that must be removed from the body can be feces and urine as a result of the digestive process and CO_2 as a result of the breathing process. To prevent and reduce contamination of dirt/feces man of the environment, the disposal of dirt needs to be properly managed in a certain place or latrines. Based on the results of this study show that most residents have disposed of feces in the latrines, as much as 51.16%. However, there are still residents who dispose of their feces in the trash 26.74% without disposing of their feces, especially first to the latrine, and 16.28% threw their feces into the canal/ditch near their house as much as Human waste should be disposed of through a septic tank consisting of tank impermeable sediment. This tank can allow dirt and water to undergo a decomposition process for 1-3 weeks. A house is said to be healthy if it meets the criteria for disposal of excrement that is not carried out in any place, not thrown into ditches/watercourses, or into gardens or backyards. When the soil is difficult, it can be made a septic tank collectively.[13,14]

For the waste management facility variable, there are many households that do not meet the requirements for waste management but statistically do not experience stunting if you look at their family members. However, when viewed from the categorization of both stunted and non-stunted families, they still have waste management that does not meet the requirements. This can also be influenced because residents have implemented other aspects of community-based total sanitation, for example, good washing habits with soap, management of clean water, and proper management of latrines. Additionally, source vector diseases caused by the presence of garbage like flies, mice, or other insects landing on food can be prevented by covering food with hood serving or other closed containers, so in this study, there was no relationship between waste management and stunting. The results of this study are in line with other studies, which state that there is no significant relationship between means of management of healthy household waste with stunting incidents where values are generated p value = 0.955. Other research states that based on statistical test results, it shows *p*-value = 1.000, which shows that there is no significant relationship between landfills with stunting incidents.[15]

In contrast to other studies, which state that there is a relationship between healthy household waste management facilities and the incidence of stunting where values are obtained p value = 0.028. However, households have not managed waste properly. For the wastewater treatment facilities variable, this is in line with other studies, which state that there is no relationship between the conditions of the wastewater disposal facilities with stunting in toddlers. Other studies state that the security of bad waste management channels is 2,250 times riskier to experience stunting compared to those who secure sewerage properly. This increased risk can be proven by data from research results that there are still 52 respondents (60.57%) residents who dispose of wastewater directly into gutters/streams, 8 respondents (9.30%) disposed of into open shelters, and 4 respondents (4.65) did not have shelters, only 22 respondents (25.58%) had closed sewerage channels, in this case, entering into the septic tank. This shows that waste management in settlements around the TPA Cipeucang still does not meet the requirements. This can be caused by a lack of public awareness and understanding of environmental hygiene and health, especially regarding wastewater disposal. Wastewater that is discharged directly into the environment (soil and water) will cause vector disease problems so that it can raise a nest and

become a breeding ground for flies, rats, and other insects. Wastewater which is Stagnant water, can become a breeding ground for mosquitoes.[16]

Families living around settlements have 18.2 times the risk of suffering from diseases that can cause stunting compared to those who have good skin hygiene. This is also supported by other studies which state that families living in garbage collectors have bad bathing habits and are at risk of worm infection. The results are not significantly related standing this can happen because information about the importance of keeping personal hygiene and healthy have been well received and obtained and can be applied by all families. In addition, high personal hygiene can also be influenced by knowledge as well as by habit factors and individual personal responses. Good personal hygiene can also occur because the role of parents is very important in shaping good health behavior, where education and knowledge about personal hygiene can be given to children from an early age so that it can become a habit as an adult. This is also evidenced by the large number of mothers who work as housewives so that the interactions between mothers and children can be closer. If the parents, in this case, the mother as the child's caretaker, know and can practice good personal hygiene for their children, then the children will also practice this personal hygiene in their family environment. Age can also affect why a person's personal hygiene is good. People in adulthood already have the independence to do personal hygiene properly. This is due to knowledge and experience which much health and disease.[13]

Poor hand hygiene is a major factor for toddlers experiencing stunting (65.9%). Another study stated that toddlers who do not wash their hands with soap have a 4 times higher risk of experiencing stunting compared to toddlers who wash their hands with soap. According to the study, there is no relationship between the quality of hand washing with a mother's soap and stunting. Toddlers who have good hygiene behavior habits, such as washing hands with soap, can reduce the risk of toddlers getting diarrhea by 45% and the risk of toddlers experiencing stunting by 14%. Toddlers who have good personal hygiene but are still experiencing stunting can be caused by factors, both directly and indirectly, in the form of low birth weight (LBW) and economic status. In addition, this can happen because the family has received good health education about personal hygiene. A good education can increase family knowledge. Adequate knowledge about good personal hygiene can influence the attitudes and behavior of mothers and children in the family. Knowledge can be affected by age, level of education, and one's job. Increasing knowledge is not only obtained from formal education but now it can be obtained from social media information and health education at Integrated Healthcare Center and Health Center. This insignificant result can also be caused because personal hygiene practices are influenced by several factors, namely social practices, economic status, motivation, physical condition, personal choice, culture, and knowledge.[17]

5. Conclusion

There is a relationship between drinking water facilities and the incidence of stunting in toddlers in the residential area around TPA Cipeucang.

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