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ANALYSIS OF PHYSICAL ENVIRONMENTAL FACTORS ON THE RISK OF STUNTING IN PREGNANT WOMEN IN THE WORKING AREA OF THE CURUGBITUNG HEALTH CENTER, LEBAK REGENCY, BANTEN

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Abstract

Background: Stunting according to the WHO (*World Health Organization*) in 2019 that the region in sothest Asia is still considered the highest with the incidence of stunting (31.9%), Indonesia is included in the sixth country. Risk factors for stunting that begin at conception, namely from maternal factors. Lack of health and nutrition knowledge from the start of pregnancy to childbirth can result in stunting in children, during pregnancy ANC, PNC, EXCLUSIVE BREASTFEEDING, and MPASI.
Objective: this study aims to determine the relationship between drinking water sources, latrine ownership, waste management, hygiene and exposure to pollutants with the risk of stunting in pregnant women in the working area of the Curugbitung Health Center, Lebak Regency, Banten.
Methodology: *Cross Seectional* method research. The study sample amounted to 107 pregnant women. *Purposive sampling* technique. The research instrument using the questionnaire consisted of clean water use, latrine ownership, hygiene behavior, waste management and exposure to pollutants.this questionnaire has been tested for validity and reliability with *a Cronbach's alpha* coefficient value of 0.836.
Research Results: there was a significant relationship between household water use (p = 0.000), latrine ownership (p = 0.30), waste management (p = 0.000), hygiene behavior (p = 0.001) and exposure to pollutants (p = 0.003) with stunting risk.
Conclusions and suggestions: physical environment analysis factors have a significant relationship with the risk of stunting in pregnant women, so it is expected to increase the role of health workers to educate the public regarding the risk of stunting.

Keywords: *Physical Environment, Risk of Stunting*

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Introduction

Stunting according to the WHO (*World Health Organization*) in 2019 that the region in sothest Asia is still considered the highest with the incidence of stunting (31.9%), after Africa (33.1%), and Indonesia is included in the sixth country in the South-East Asia region after Bhutan, Timor Leste, Maldives, Bangladesh, and India, which is 36.4%. Stunting is still considered the first problem in Indonesia. With the results of Basic Health Research (Riskesdas) in 2018, the incidence of stunting in Indonesia was 30.8%. This number is still in the high category compared to the target of the National Meenengaj Term Development Plan (RPJMN) of 19% in 2024. Stunting has the highest number compared to other nutritional problems in undernourished, thin, and obese stated by Yusuf (2022). (Joseph, 2022).

The results of the Indonesian Nutritional Status Study (SSGI) survey of the Ministry of Health noted that 24.5% of infants under 5 years old (toddlers) in Banten Province were stunted in 2021. Pandeglang Regency is recorded as the area with the highest prevalence of stunting toddlers in Banten, reaching 37.8% last year. That is, 1 in 3 toddlers in the district is stunting.

The area with the next highest stunting toddler is Lebak Regency, which reached 27.3%, followed by Serang Regency at 27.2%, Serang City at 23.4%, Tangerang Regency at 23.3%. Then Cilegon City with a stunting prevalence of 20.6%, Cilegon City by 20.6%, South Tangerang City by 19.9%, and Tangerang City by 15.3%. For information, the national prevalence of stunting toddlers is 24.4% in 2021. This figure is lower than SSGI 2019 which was 27.7% stated by Kusnandar (2021) (Kusnandar, 2021)

According to Sari and Roz (2022), stunting is a disruption in children's growth and development due to serious malnutrition and recurrent infections, with characteristics of length and height below normal, as well as implementation determined by the minister of government management in the health sector (Presidential Regulation of the Republic of Indonesia Number 72 of 2021 concerning the Acceleration of Stunting Reduction, 2021).

According to Sari & Harianis (2021), the normal average standard for assessing children's nutritional status, short and very short, is nutritional status which is included in the categories of stunted (short) and severely stunted (very short), if -3 elementary schools to <-2

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elementary schools are included in the short category while <-3 elementary schools are included in the very short category (Ministry of Health, 2018).

Nurfatimah *et al*., 2021 fattened that the occurrence of stunting can also be seen from the pregnancy period with lack of nutritional intake, irregular diet, and insufficient food levels so that fetal growth becomes inhibited. Participation between education levels, knowledge of nutritional fulfillment during pregnancy with improved nutrition and health during pregnancy. Due to lack of awareness and improper application so that it is hampered to improve nutrition, because basically there are still many people who do not know about nutrition during pregnancy and the first 1000 days of life are very important for the growth and development of the baby in the future.

Yusuf (2022) suggests that the incidence of stunting with various interrelated factors is not due to malnutrition of pregnant women or toddlers alone. In Indonesia, there are various studies related to stunting risk factors starting at conception, namely from maternal factors. Lack of health and nutrition knowledge from the start of pregnancy to childbirth can result in stunting in children, during pregnancy ANC (Ante Natal Care) services are maternal health services during pregnancy, PNC (Post Natal Care) health services after childbirth, the importance of getting knowledge from an early age is important with adequate consumption of iron tablets during pregnancy, exclusive breastfeeding, and good complementary foods. (Joseph, 2022).

According to Dasman (2019), the impact of stunting proposed by Hardisman Dasman four impacts of *stunting* for children and the State of Indonesia are weak cognitive and psychomotor inhibited, difficulty *mastering* science and achieving in sports, younger affected by degenerative diseases, and low-quality human resources. (Dasman, 2019)

Efforts to prevent stunting by the Government have provided policies through Presidential Decree Number 42 of 2013 concerning the National Movement for Increasing Nutrition Acceleration with a focus on the first age group of 1000 days of life, namely: Pregnant women are required to get Blood Added Tablets (TTD) at least 90 tablets during pregnancy, Supplementary Feeding (PMT) for pregnant women, Fulfillment of nutrition, Childbirth with an expert doctor or midwife, Early Breastfeeding Initiation (IMD), Exclusive breastfeeding for infants up to 6 months of age, Complementary Breastfeeding (MP-ASI) for

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infants over 6 months to 2 years, Providing complete basic immunization and vitamin A, Monitoring toddler growth at the nearest posyandu, Implementation of Clean and Healthy Living Behavior (PHBS).

In addition, the government also organizes PKGBM is a Community-Based Health and Nutrition Project to prevent stunting. PKGBM is a program to prevent stunting in certain areas. It is with the objectives of the program: reduce and prevent low birth weight, malnutrition, and stunting in children, and increase household / family income with cost savings, productivity growth and higher income (Rahayu *et al*., 2018).

There is a relationship between hygiene behavior and the incidence of stunting in toddlers 12-59 months that poor hygiene behavior is at risk of becoming stunting. There is a relationship between poor environmental sanitation and the incidence of stunting in toddlers aged 12-59 months. Poor sanitation includes water sources, water storage quality, latrine ownership and home environments tend to be in slum areas according to (Khairiyah and Fayasar, 2020).

Based on the number of pregnant women in the Curugbitung Health Center Working Area, Lebak Regency, Banten, there were 143 pregnant women in December. from data obtained in December 2022, there were a total of 137 toddlers with the results of the examination, there were 15 toddlers who were malnourished, and 21 of them were very short. Seeing the phenomenon in accordance with the background above with the incidence of stunting, researchers are interested in conducting research on physical environmental factors on the risk of stunting in pregnant women in Cipining Village, Curugbitung Health Center work area, Lebak Regency, Banten.

Materials and methods

The design of this study is an analytical survey study to determine the relationship of physical environmental factors to the risk of stunting in pregnant women using quantitative data through *a cross sectional* approach. The sample of this study was pregnant women who lived in Cipining Village, Curugbitung Health Center work area. The sample size in this study was 107 pregnant women. Sampling in this study used *purposive sample techniques.* This research was carried out from December 2022 - January 2023.

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The tool to be used in this study is a questionnaire sheet, an observation sheet which is a collection of questions asked to respondents. Data analysis using *Chi Square* test with 95% confidence or α=0.05. The existence of a meaningful relationship between two variables occurs if the p value is smaller than α=0.05 (p<0.05). Conversely, the two variables have no relationship if the p value is greater than the value of α=0.05 (p≥0.05).

Result

Table 1
Relationship between Household Water Use and *Risk of Stunting* in Pregnant Women

Household water use	Risk of stunting				Sum		*p-value*	OR
	Low risk		High risk					
	n	%	n	%	n	%		
Good	66	90,4	7	9,6	73	100		
Bad	20	58,8	14	41,4	34	100	0,000	6,600
Total	86	80,4	21	19,6	107	100		

Source : Primary Data 2023

Based on table 1, it can be seen that of the 73 pregnant women in good household water use, 66 (90.4%) are in the low-risk category of stunting, and pregnant women who fall into the high-risk category are 7 (9.6%). While household water use is not good, out of 34 pregnant women, there are 20 (58.8%) in the low risk category and pregnant women who fall into the high risk category there are 14 (41.4%) pregnant women. Based on the results of the bivariate test using the ChiSquare test, a p value = 0.000 or (p<0.05) means that there is a relationship between household water use and the risk of stunting in pregnant women.

Table 2
The Relationship between Latrine Ownership and *Stunting Risk*

Ownership of latrines	Risk of stunting				Sum		-*value*	R
	Low risk		High risk					
Have	8	3,9	5	6,1	93	100		
It doesn't have	78	7,1	6	2,9	14	100	0,030	0,900
Total	86	0,4	21	9,6	107	100		

Source : Primary Data 2023

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Based on table 2, it can be seen that of the 93 pregnant women who have good latrines, there are 78 (83.9%) who are in the low risk category of stunting, and pregnant women who fall into the high risk category there are 15 (16.1%). While those who did not have latrines of 14 pregnant women there were 8 (57.1%) in the low risk category and pregnant women who fell into the high risk category there were 6 (42.9%) pregnant women.

Based on the results of statistical tests using the ChiSquare test, a p value = 0.030 or (p<0.05) means that there is a relationship between household water use and the risk of stunting in pregnant women

Table 3
The Relationship between Latrine Ownership and *Stunting Risk*

Ownership of latrines	Risk of stunting				Sum		p-value	0R
	Low risk		High risk					
	N	%	N	%	n	%		
Have	78	83,9	15	16,1	93	100	0,030	3,900
It doesn't have	8	57,1	6	42,9	14	100		
Total	86	80,4	21	19,6	107	100		

Source : Primary Data 2023

Based on table 3, it can be seen that of the 93 pregnant women who have good latrines, there are 78 (83.9%) who are in the low risk category of stunting, and pregnant women who fall into the high risk category there are 15 (16.1%). While those who did not have latrines of 14 pregnant women there were 8 (57.1%) in the low risk category and pregnant women who fell into the high risk category there were 6 (42.9%) pregnant women. Based on the results of statistical tests using the ChiSquare test, a p value = 0.030 or (p<0.05) means that there is a relationship between household water use

Table 4.
The Relationship between Waste Management and the Risk of *Stunting* in Pregnant Women

Waste management	Risk of stunting				Sum		*-value*
	Low risk		High risk				
Available and healthy	65	91,5	6	8,5	71	100	0,000

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Available and unhealthy	1	100	0	0	1	100
Unavailable and unhealthy	20	7,1	15	2,9	35	100
Total	86	0,4	21	9,6	107	100

Source : Primary Data 2023

Based on table 4, it can be seen that of the 71 pregnant women in the management of available and healthy waste, there are 65 (91.5%) in the low-risk category of stunting, and pregnant women who fall into the high-risk category there are 6 (8.5%). While of 1 pregnant woman in the management of available and unhealthy waste, there is 1 (100%) pregnant woman who falls into the low-risk category of stunting, of the 35 pregnant women in the management of unavailable and unhealthy waste, there are 20 (57.1%) in the low-stunting category, and those who fall into the high-risk category of stunting there are 15 (42.9%).

Based on the results of statistical tests using the ChiSquare test, a p value = 0.000 or (p<0.05) means that there is a relationship between household water use and the risk of stunting in pregnant women.

Table 5.
Relationship between Hygiene Behavior and Risk of *Stunting*

Hygiene Behavior	Risk of stunting				Sum		p-value	OR
	Low risk		High risk					
	n	%	n	%	n	%		
Good	55	93,2	4	6,8	59	100	0,001	7,540
Bad	31	64,6	17	35,4	48	100		
Total	86	80,4	21	19,6	107	100		

Source : Primary Data 2023

Based on table 5, it can be seen that of the 59 pregnant women with good hygiene behavior, 55 (93.2%) are in the low-risk category of stunting, and pregnant women who fall into the high-risk category are 4 (6.8%). While pregnant women with poor hygiene behavior out of 48 pregnant women, there were 31 (64.6%) in the low risk category and pregnant women who fell into the high risk category there were 17 (35.4%) pregnant women.

Based on the results of statistical tests using the ChiSquare test, a p value = 0.001 aau (p <0.05) means that there is a relationship between hygiene behavior and the risk of stunting in pregnant women in the Curugbitung Health Center Work Area

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Discussion

Relationship between Household Water Use and *Risk of Stunting*

The results of this study show that the use of household water mostly uses household water in the good category and there is a relationship between household water use and the risk of stunting in pregnant women. Pregnant women whose household water use is good have the opportunity to be at low risk of giving birth to children at risk of stunting.

According to the book from the source Rahayu *et al*. (2018), the health status of toddlers includes the incidence of diarrhea and acute respiratory tract infections (ARI) in toddlers. Sanitation in slums is usually poor and this situation can lead to increased transmission of infectious diseases. In developing countries, infectious diseases in children are important health problems and are known to affect children's growth. Some examples of infections that are often experienced are enteric infections such as diarrhea, enteropathy, and worms, can also be caused by respiratory infections (ARI), malaria, reduced appetite due to infection, and inflammation.

This is in line with research, Inamah *et al*. (2020), showing that there is a relationship between clean water facilities and nutritional status. because poor environmental sanitation affects the nutritional problems of toddlers, so environmental sanitation is very important to pay attention to because it has an impact on nutritional problems in the long term and water sources that use well water increase the risk of toddlers experiencing stunting higher than treated water sources (PAM).

In accordance with theories and related research that pregnant women who use good household water are at low risk of giving birth to children at risk of stunting because good sanitation will avoid several diseases, thus avoiding anemia and chronic energy deficiency (SEZ).

The Relationship between Latrine Ownership and *Stunting Risk*

The results of this study show that latrine ownership in pregnant women is mostly latrine ownership in the category of owning and there is a relationship between latrine ownership and the risk of stunting in pregnant women. Pregnant women who have good latrines are likely to be at low risk of giving birth to children at risk of stunting.

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According to Siswati (2018), infection is a factor that affects nutritional status directly in addition to nutritional adequacy. The high prevalence of infection in children living in poor areas of developing countries disrupts linear growth.

This is in line with the research, Zahrawani *et al*. (2020), that there is a relationship between the condition of latrines and the incidence of stunting. The incidence of stunting is most common in children who use unhealthy latrines. So it can be concluded that the use of healthy latrines will reduce the possibility of stunting.

In accordance with related theories and research that pregnant women who have latrines are at low risk of giving birth to children at risk of stunting because according to researchers the information obtained that the residence is in the form of plots or just hitchhiking other people's land to be used as a place to live where there is no latrine, so the latrines are used together.

The Relationship Between Waste Management and *Stunting Risk*

The results of this study show that waste management in pregnant women is mostly waste management in the category of available and healthy, there is a relationship between waste management and the risk of stunting in pregnant women. Pregnant women with available and healthy waste management are at low risk of giving birth to children at risk of stunting.

According to the book from the source Rahayu *et al*. (2018), the health status of toddlers includes the incidence of diarrhea and acute respiratory tract infections (ARI) in toddlers. Sanitation in slums is usually poor and this situation can lead to increased transmission of infectious diseases. In developing countries, infectious diseases in children are important health problems and are known to affect children's growth. Some examples of infections that are often experienced are enteric infections such as diarrhea, enteropathy, and worms, can also be caused by respiratory infections (ARI), malaria, reduced appetite due to infection, and inflammation.

The results of this study are in line with Soeracmad *et al*. (2019), showing the results of a significant influence between securing household waste and stunting events.

In accordance with theories and related research that pregnant women with healthy waste management are at low risk of giving birth to children at risk of stunting, because if the

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environment is dirty it will cause various diseases, especially in pregnant women such as diarrhea, malaria and so on which result in anemia and chronic lack of energy.

The Relationship Between Hygiene Behavior and *Stunting Risk*

The results of this study show that hygiene behavior in pregnant women is mostly hygiene behavior in the good category and there is a relationship between hygiene behavior and the risk of stunting in pregnant women. Pregnant women who have good hygiene behavior are likely to be at low risk of giving birth to children at risk of stunting.

According to the book from the source Rahayu *et al.* (2018), the health status of toddlers includes the incidence of diarrhea and acute respiratory tract infections (ARI) in toddlers. Sanitation in slums is usually poor and this situation can lead to increased transmission of infectious diseases. In developing countries, infectious diseases in children are important health problems and are known to affect children's growth. Some examples of infections that are often experienced are enteric infections such as diarrhea, enteropathy, and worms, can also be caused by respiratory infections (ARI), malaria, reduced appetite due to infection, and inflammation.

This research is also in line with Soeracmad *et al.* (2019), where the results of this study show a significant influence between hand washing behavior in running water using soap on the incidence of stunting.

In accordance with theories and related research that pregnant women with good hygiene behavior are at low risk of giving birth to children at risk of stunting, because if the mother does not maintain hygiene behavior will result in infection of microorganisms that are at risk in the fetus where the fetus becomes BBLR, defects at birth and experience impaired intelligence.

The Relationship Between Exposure to Pollutants and the Risk of *Stunting*

The results of this study show that exposure to pollutants in pregnant women is mostly exposure to pollutants in the category of not exposed and there is a relationship between exposure to pollutants with the risk of stunting in pregnant women. Pregnant women whose exposure to pollutants are not exposed have a low risk of giving birth to children at risk of stunting.

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The habit of producing pollutants in the household such as fine particulate matter and carbon monoxide can be detrimental to health. While households with poor ventilation, smoke in and around the house can exceed the body's acceptable threshold, even the amount of toxic fine particles reaches levels up to 100 times by Siswati (2018).

This study is also in line with Eka Sari and Resiyanth (2020) that there is a relationship between parental smoking behavior and the incidence of stunting in toddlers aged 2-5 years, and has a low correlation or relationship strength.

However, according to research Hidayah (2022) The results of a literature review stated that the low height and weight of toddlers is a result of exposure to cigarette smoke. Toddlers who are exposed to secondhand smoke in large quantities and for a long duration have a lower head circumference, height, and weight than toddlers who are not exposed to secondhand smoke.

In accordance with theories and related research that pregnant women with exposure to pollutants that are not exposed are at low risk of giving birth to children at risk of stunting, because nicotine in cigarette smoke and the content of cooking fuel smoke can damage health and potentially cause air pollution resulting in impaired growth in the fetus.

Conclusion and Advice

There is a significant association between household water use, latrine ownership, waste management, hygiene behavior and exposure to pollutants with stunting risk

It is expected to increase the role of health workers to provide education to the public regarding physical environmental factors in pregnant women to prevent the risk of stunting.

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