



## ANALYSIS OF ENVIRONMENTAL FACTORS IN STUNTING LOCUS AREAS

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### ABSTRACT

Shortness is identified by comparing a child's height with the standard height of children in a normal population of the same age and sex. The results of the 2021 Indonesian Nutrition Status (SSGI) study showed that the stunting rate in West Sulawesi was 33.38%. (Ministry of Health of the Republic of Indonesia, 2021) and 2022 shows that the prevalence of stunting nationally is 21.6% with the prevalence of stunting in West Sulawesi Province 35%. This research was conducted with a quantitative approach. Data was collected using a structured questionnaire to look at environmental factors related to stunting through the chi square test. The results of the crosstabulation analysis of stunting incidents with sanitation conditions in Tabolang village after being categorized, found that the p value = 0.687. These results indicate that there is no relationship between sanitation conditions and the incidence of stunting in Tabolang Village. There was no relationship between environmental conditions and the incidence of stunting in this study. However, in order to prevent stunting in society, programs related to improving the environment need to be given attention and carried out through collaboration between the government and the community.

Keywords: environment; drinking water; stunting; toilet

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## INTRODUCTION

Shortness is identified by comparing a child's height with the standard height of children in a normal population of the same age and sex. A child is said to be short (stunting) if his height is below -2 SD from the WHO standard (Trihono et al., 2015). Shortness (stunting) is a hidden tragedy. Shortness of breath occurs due to the impact of chronic malnutrition during the first 1,000 days of a child's life (Trihono et al., 2015). Although global mobilization around stunting has begun, much remains to be done to determine how effective current actions/interventions implemented on a large scale will be to achieve a sustainable impact (World Health Organization, 2014). Stunting is the forerunner to the emergence of bigger health problems in adulthood which we often know as non-communicable diseases (NCDs) (Rahim & Muslimin, 2019).

The results of Basic Health Research in 2018 showed that the prevalence of stunting under five was 19.3% (Kemenkes RI, 2018) Stunting children in West Sulawesi province in 2015 was 38.4%, the second largest after NTT, in 2016 which was 39.7%, the highest percentage of all provinces. In 2017, the percentage increased again to 40.1% and was the second highest after NTT and in 2018 the prevalence of stunting in West Sulawesi was the second highest nationally after NTT (Kemenkes RI, 2018). The results of the 2021 Indonesian Nutrition

Status (SSGI) study showed that the stunting rate in West Sulawesi was 33.38%. (Ministry of Health of the Republic of Indonesia, 2021) and 2022 shows that the national prevalence of stunting is 21.6% with the prevalence of stunting in West Sulawesi Province being 35%. (Ministry of Health of the Republic of Indonesia, 2022). Central Mamuju Regency is one of 6 regencies in West Sulawesi where there are still areas/villages with the Stunting Locus Category. The prevalence of stunting in Central Mamuju Regency based on SSGI in 2021 and 2022 is 26.3% and 28.1% respectively (Ministry of Health of the Republic of Indonesia, 2021) (Ministry of Health of the Republic of Indonesia, 2022). Tabolang Village is one of the villages that until 2022 will be a village designated as a regional area with a special location for stunting.

Stunting can occur due to several factors. Nowadays, what is widely studied is the knowledge factor related to the incidence of stunting. It is considered that knowledge is one of the factors in the occurrence of stunting. If we trace it, knowledge is closely related to stunting. The results of research conducted by Rahim and Muslimin show that providing health education using modeling techniques is effective in increasing knowledge, health education can be carried out through health promotion as a form of early prevention (Rahim & Muslimin, 2019)(Muslimin & Mallongi, 2021). Another factor related to stunting is One of the factors that influence the incidence of stunting is environmental factors. Result study from (Kalinda et al., 2023) shows that individual and community level factors are critical in determining children's linear growth. The model fit further shows that 20% of the variation in stunting is caused by factors at the individual level, factors at the environmental level, and factors at the contextual level such as place of residence. Historically research on stunting has focused on food intake, but increasing evidence shows the important role of the natural and physical environment in children's health. The interaction between environment and nutrition presents an interesting dynamic, where the interaction between environmental factors and nutritional status can cause changes in health status. (Kordas, Lönnerdal, & Stoltzfus, 2007). With regard to environmental factors such as access to water and sanitation, there is some evidence for an association with reduced rates of diarrhea, which is also a predictor of child nutrition. One such study included a multi-village project in Ethiopia, where 11 villages were selected for a health, education, WASH intervention, or an integrated approach using health, education, and hygiene. (Fenn, Bulti, Nduna, Duffield, & Watson, 2012). Environmental health problems are one of several priority health problems that require attention because if not handled properly, they can cause the emergence of disease germs. For example, providing family toilets in the community, especially in its implementation, is not something easy, therefore synergistic collaborative efforts between the community and the government are needed to improve environmental sanitation. (Utama, Inayati, & Sugiarto, 2019). For other countries working to improve nutrition, stunting reduction can be helped by lessons learned from implementing poverty alleviation policies and implementing equitable cross-sectoral interventions, with a focus on the poorest areas (Huicho et al., 2017). This research aims to provide an overview and present the results of an analysis of the relationship between sanitation factors and the incidence of stunting in villages which are special stunting locations.

## **METHOD**

This research was conducted with a quantitative approach. Data collection uses a structured questionnaire to look at environmental factors related to stunting. The respondents were 147 mothers with toddlers in Sinabatta Village, one of the villages which is a special location for preventing stunting. The sample size calculation used exhaustuc sampling, namely conducting interviews with all mothers who have toddlers. The statistical test used in this research is the chi square test.

## RESULTS

This research analyzes environmental factors related to stunting in special locations for stunting prevention. The variables analyzed in this research include: Type of main source used for household purposes, type of main source used for drinking purposes, physical quality of drinking water, ownership of rubbish bins and places to defecate.

Table 1.

Types of Main Water Sources	f	%
Tap water/PDAM	99	66,4
Drilled well/pump	33	2
The dug well is protected	1	0,7
The dug well is not protected	1	0,7
Protected spring	41	27,5
Springs are not protected	2	1,3
inwater storage	1	0,7
River/lake/irrigation water	1	0,7

Table 2.

Types of Main Water Sources	f	%
Bottled water	1	0,7
Water refill/water depot	46	30,9
Tap water/PDAM	70	47,0
Drilled well/pump	3	2,0
Protected spring	26	17,4
The springs are not protected	3	2,0

Table 3.

Physical Quality of Drinking Water	Yes		No	
	f	%	f	%
Clear	145	97,3	4	2,7
Tasteless	112	75,2	37	24,8
Odorless	111	74,5	38	25,5

Table 4.

Have a Trash Can	f	%
Yes	52	34,9
No	97	65,1

Table 5.

Place to Defecate	f	%
WC/Toilet	147	98,7
river/lake	1	0,7
Others	1	0,7

The results showed that 66.4% of respondents in this study used plumbing/PDAM as the main source of daily household needs, 47% used plumbing/PDAM as the main source of drinking water. Based on the physical quality of drinking water, there are still 2.7% of respondents' drinking water that is not clear, 24.8% of drinking water has a taste and 25.5% of drinking water has a smell. This indicates that the respondents consumed poor quality drinking water.

Table 6.  
Relationship between Stunting Incidents and Sanitation Conditions in Tabolang Village

Sanitary Conditions	Stunting		Not Stunting		Total		p
	f	%	f	%	f	%	
Unimproved	2	22,2	7	77,8	9	100	
Improved	27	19,3	113	80,7	140	100	0,687

Based on the waste bin ownership variable, only 34.9% of respondents have trash cans, so that of the total respondents there are more people who don't have trash cans than those who do. In terms of appropriate places to defecate, 98.7% of respondents defecate in the toilet/toilet and 1.4% in other places. The results of the crosstabulation analysis of stunting incidents with sanitation conditions in Tabolang village after being categorized, found that the p value = 0.687. These results indicate that there is no relationship between sanitation conditions and the incidence of stunting in Tabolang Village.

## DISCUSSION

Water has an important role for human life. Humans use water for bodily needs and water to quench thirst. Using clean water in the family will prevent various diseases such as diarrhea, typhoid and others. The results of this research show that in general sanitation conditions are not related to the incidence of stunting at the research location (p= 0.687). The results of this research are different from the results of a systematic review study conducted by (Hartati & Zulminiati, 2020) which found that the majority of research results revealed that water and sanitation factors were associated with an increase in the incidence of stunting among toddlers in Indonesia. Some evidence from research in Indonesia is similar to findings from abroad which reveal that unimproved water increases the incidence of stunting in toddlers. Findings in Ethiopia reveal that drinking water sources are related to the incidence of stunting in children under five (Kwami, Godfrey, Gavilan, Lakhnpaul, & Parikh, 2019).

Result study from (Otsuka, Agestika, Widyarani, Sintawardani, & Yamauchi, 2019) revealed that households that consume drinking water sourced from tap water can increase the incidence of stunting in children compared to households that use tank water and wells. This can happen if the quality of tap water used by households does not meet the physical quality requirements compared to tank and well water. Based on RI Minister of Health No. 32/2017, the physical quality of drinking water must meet health requirements, namely not cloudy/clear, tasteless, odorless, not contaminated with chemicals and free from various microorganisms that can cause children to experience stunting. Water quality is also related to wastewater disposal channels. The poor quality of waste water channels is the cause of pollutants that seep into well water being carried into river water so that the water becomes polluted and becomes a source of transmission of infectious diseases. Unqualified waste disposal channels are places where disease vectors such as cockroaches and flies transfer seeds into the water and food environment, thereby causing infectious diseases (Purba, Sunarsih, Trisnaini, & Sitorus, 2020). This research location describes 2 characteristics of village areas, where each village has different geographical land conditions. Although in theory water conditions would certainly contribute to stunting, this did not happen in this study. The results of this research are in line with research conducted by (Raihani, Rahayuwati, Yani, Rakhmawati, & Witdiawat, 2023) which found that based on the results of statistical tests between the variable availability of basic sanitation facilities and the incidence of stunting, it showed that there was no relationship between the two. Apart from water problems, environmental conditions such as the existence of rubbish bins which are closely related to where each household throws rubbish, as well as where to defecate are often factors in the occurrence of stunting. Healthy latrines mean that waste disposal can break the chain of transmission of infectious diseases. A latrine with adequate quality will prevent vectors for

the spread of disease to latrine users and the surrounding environment (Kementerian Kesehatan Republik Indonesia, 2014). Unsanitary latrines also cause pollution to ground water such as wells and surface water such as rivers which allows the transmission of infectious diseases (Purba et al., 2020). Furthermore (Crocker & Bartram, 2016) and (Modern, Sauli, & Mpolya, 2020) states that sharing toilets between different households increases the risk of diarrhea in children, thereby increasing their chances of experiencing stunting. A better understanding of the interactions between nutrition and environmental exposure is needed to guide government and individual action. Future nutrition research will need to consider exposure to environmental pollutants in their study populations and investigate the impact of nutritional interventions as approaches to prevent or reduce toxicity. (Kordas et al., 2007).

## CONCLUSION

There was no relationship between environmental conditions and the incidence of stunting in this study. However, in order to prevent stunting in society, programs related to improving the environment need to be given attention and carried out through collaboration between the government and the community.

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