

## The Relationship Between Open Defecation Behavior & Handwashing Behavior and Stunting Incidents in Lae Motong Village, Penanggalan District, Subulussalam City

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### ABSTRACT

Symptoms of stunting are recognized by a physical condition where a person's height is only below the normal range for his age, this symptom is also very susceptible to be associated with malnutrition with a long-term percentage that occurs in infants under five years old, also characterized by a z score of -2 SD (stunted) or -3 SD (severe stunted). This study aims to investigate the correlation between open defecation behavior & handwashing practices with soap and stunting occurrences in Lae Motong Village, Penanggalan District, Subulussalam City. It employed an observational analytical design with a cross-sectional approach, focusing on a population of mothers with toddlers, totaling 129. 56 respondents were selected as samples through accidental sampling. Data collection was conducted using structured questionnaires, with analysis performed through the chi-squared test. The findings reveal a significant correlation between open defecation behavior and stunting incidents ( $p$ -value = 0.022), as well as between handwashing practices with soap and stunting incidents ( $p$ -value = 0.014) in Lae Motong Village, Penanggalan District, Subulussalam City.

**KEYWORDS:** Open Defecation Behavior, Handwashing with Soap, Stunting.

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### INTRODUCTION

Traditionally, stunting has been attributed to inadequate and insufficient nutrition. However, recent studies have revealed that stunting persists even among adequately nourished children, suggesting the involvement of other factors, such as poor water, sanitation, and hygiene (WASH) conditions. Sanitation conditions around the environment are not maintained and classified as poor due to insufficient access to clean water and far from adequate, fulfillment of toilet facilities that do not match the criteria of a healthy toilet, and the absence of handwashing with soap practices. These conditions can lead to recurrent diarrhea or intestinal infections (Prabawa & Maulida, 2023).

Indonesia ranks among the top countries in the Southeast Asia Region (SEAR) with the highest prevalence of stunted toddlers, according to fakta compiled by the World Health Organization (World Health Organization). The prevalence of stunting in 2020 was reported at 38.9% by Indonesia's Ministry of Health. Stunted toddlers, also known as dwarfs, exhibit shorter lengths or heights compared to their

peers. Nutritional imbalances contribute to stunting, a condition characterized by a decelerated growth rate (Berat *et al.*, 2020).

Aceh consistently records one of the highest stunting rates annually. In 2017, the rate was 35.7%, and by 2018, it had risen to 37.7% (Yarmaliza *et al.*, 2021). According to data from the Health Office of Subulussalam City, the prevalence of stunting among toddlers in 2022 was less than 8%, with 10% classified as short stature and 5% as underweight. Lae Motong Village, located in Subulussalam City, still reports cases of stunted toddlers, with 18 cases recorded in 2023. Furthermore, the percentage of villages implementing the Community-Based Total Sanitation (Indonesian: *Sanitasi Total Berbasis Masyarakat* [STBM]) Program in Subulussalam City reached 31.7% in 2022, marking an increase from 9.8% in 2021. This suggests that the village has yet to fully adopt all five pillars of the STBM program (Indonesia's Ministry of Health, 2022).

Key factors contributing to child malnutrition include poverty, premature birth, low birth weight, recurrent

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infections exacerbated by With the large use of drinking water and sanitation is still classified as non-sterile, there are restrictions on access to health services, food insecurity, lack of activities in parenting and feeding practices, not maintained quality of nutrition and maternal health, low knowledge and understanding of a mother, and a fairly short birth distance.(Ndagijimana *et al.*, 2024).

Information from UNICEF in BAPPENAS (2011) asserts that both direct and indirect factors play a role in determining the nutritional status of children, including stunting. Direct factors encompass gender, low birth weight, and dietary patterns characterized by low energy and protein intake, as well as health conditions such as acute respiratory infections and diarrhea. Conversely, indirect factors include caregiving practices, access to healthcare services, and familial characteristics such as parental occupation, education level, and economic status (Daracantika *et al.*, 2021).

Based on the research conducted by Yuliani Sorachmad *et al.* (2019), there is a significant association between handwashing with soap and the incidence of stunting in toddlers ( $p$ -value = 0.000). Similarly, significant associations were found between household waste management and the incidence of stunting in toddlers ( $p$ -value = 0.000), as well as between wastewater disposal systems and the incidence of stunting in toddlers ( $p$ -value = 0.000) (Soeracmad *et al.*, 2019).

Another study conducted by Zulfikar Ahmad (2019) in Gorontalo Regency regarding defecation behavior and ownership of healthy toilets with the incidence of stunting in toddlers in Labuan District revealed an odds ratio of 3.438 (95% CI; 1.164 – 10.152). This suggests that families without healthy toilets and proper defecation behavior are 3.438 times

more likely to have stunted toddlers compared to families with healthy toilets (Khoerul Ummah, 2022).

Based on data obtained from the village midwife of Lae Motong, Penanggalan District, Subulussalam City, there are a total of 129 toddlers, among which 18 are afflicted with stunting. Through observations conducted by the researchers involving five respondents, it can be deduced that some members of the community lack proper sanitation facilities in their homes and engage in open defecation practices. Additionally, among these five respondents, some individuals still exhibit the habit of not washing their hands before feeding toddlers, breastfeeding infants, and after defecation.

## METHODS

This study employed an observational analytical approach with a cross-sectional design. It was conducted in Lae Motong Village, Penanggalan District, Subulussalam City, from February 15, 2024, to March 12, 2024. The population consisted of 129 mothers with toddlers. Furthermore, the sampling method used was accidental sampling, where subjects who coincidentally encountered the researchers and were deemed suitable as data sources were selected as samples. Furthermore, sample size calculation was performed using Slovin's formula with a 10% error margin, resulting in a sample size of 56 respondents. Additionally, data collection was carried out using questionnaires. Apart from that, univariate analysis was employed to generate frequency distributions and percentages for each variable. Meanwhile, bivariate analysis was conducted using the chi-squared test.

## RESULTS

### Description of Respondents' Characteristics

Table 1. Distribution of respondents' characteristics in Lae Motong Village, Penanggalan District, Subulussalam City

Characteristics	F	%
<b>Age</b>		
a. 17 – 25 Years	11	19.6
b. 26 – 35 Years	39	69.6
c. 36 – 45 Years	4	7.1
d. 46 – 55 Years	2	3.6
<b>Education</b>		
a. Elementary School	1	1.8
b. Junior High School	7	12.5
c. Senior High School	40	71.4
d. University	8	14.3
<b>Occupation</b>		
a. Housewife	48	85.7
b. Merchant	3	5.4
c. Civil Servant	3	5.4
d. Private Employee	2	3.6

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<i>Toddler's Gender</i>		
a. Male	32	57.1
b. Female	24	42.9
<b>Total</b>	<b>56</b>	<b>100%</b>

*Source: Primary Data, 2024.*

Based on Table 1 above, it is evident that the majority of respondents, based on age, exhibit differences in proportions. Among the 56 respondents, the majority of mothers fall within the 26 – 35 years age group, totaling 39 respondents with a percentage of 69.6%, while the lowest proportion is in the 46 – 55 years age group, accounting for only 3.6%.

In terms of education, 40 respondents have completed senior high school, representing 71.4%, while only 1 respondent has an elementary school education, accounting

for 1.8%. Moreover, 48 respondents work as housewives, comprising 85% of the total. Additionally, there are 32 male toddlers, making up 57.1%, while the number of female toddlers is 24, constituting 42.9%.

**Univariate Analysis**

Univariate analysis depicts respondents' characteristics based on the dependent variable (i.e., the occurrence of stunting) and the independent variable (i.e., the implementation of the Community-Based Total Sanitation).

**Table 2. Frequency distribution of respondents based on open defecation behavior in Lae Motong Village, Penanggalan District, Subulussalam City**

<b>Open Defecation Behavior</b>	<b>F</b>	<b>%</b>
Poor	36	64.3
Good	20	36.7
<b>Total</b>	<b>56</b>	<b>100.0</b>

*Source: Primary Data, 2024.*

Based on the data presented in Table 2, it is evident that the predominant behavior among respondents is

categorized as poor, with 36 respondents, comprising 64.3% of the total. Conversely, only 20 respondents, or 35.7%, demonstrate good behavior.

**Table 3. Frequency distribution of respondents based on handwashing behavior with soap in Lae Motong Village, Penanggalan District, Subulussalam City**

<b>Handwashing Behavior with Soap</b>	<b>F</b>	<b>%</b>
Poor	44	78.6
Good	12	21.4
<b>Total</b>	<b>56</b>	<b>100.0</b>

*Source: Primary Data, 2024.*

Based on the findings in Table 3, it is apparent that the majority of respondents demonstrate inadequate handwashing behavior with soap. Specifically, 44 respondents, constituting 78.6% of the sample, display poor handwashing habits. In contrast, only 12 respondents, representing 21.4% of the total, adhere to good handwashing practices.

**Table 4. Frequency distribution of respondents based on the incidence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City**

<b>Stunting Incidence</b>	<b>F</b>	<b>%</b>
Stunted	15	26.8
Not Stunted	41	73.2
<b>Total</b>	<b>56</b>	<b>100.0</b>

*Source: Primary Data, 2024.*

As shown in Table 4, a total of 15 toddlers are affected by stunting, constituting 26.8% of the sample,

whereas 41 toddlers remain unaffected by stunting, representing 73.2%.

**Bivariate Analysis**

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Bivariate analysis aims to discern the relationship between independent and dependent variables using statistical tests. The statistical test employed in this study is the chi-squared test, with a significance tataran set at 0.05. The following presents the outcomes of the bivariate analysis.

### 1. The Relationship between Open Defecation Behavior and the Incidence of Stunting in Lae Motong Village, Penanggalan District, Subulussalam City

As demonstrated in Table 5, the chi-squared test outcomes indicate that among respondents with poor open defecation behavior criteria, 6 individuals (16.7%) experienced stunting, while 30 respondents (83.3%) did not. Conversely, among respondents with good open defecation behavior criteria, 9 individuals (45.0%) experienced stunting, whereas 11 respondents (55.0%) did not.

**Table 5. The Relationship between Open Defecation Behavior and the Incidence of Stunting in Lae Motong Village, Penanggalan District, Subulussalam City**

Open Behavior	Defecation	Incidence of Stunting				Total	P-Value	
		Stunted		Not Stunted				
		F	%	F	%			
Poor		6	16.7	30	83.3	36	100	0.022
Good		9	45.0	11	55.0	20	100	

Source: Primary Data, 2024.

**Table 6. The Relationship between Handwashing Behavior with Soap and the Incidence of Stunting in Lae Motong Village, Penanggalan District, Subulussalam City**

Handwashing Behavior with Soap		Incidence of Stunting				Total	P-Value	
		Stunted		Not Stunted				
		F	%	F	%			
Poor		15	34.1	29	65.9	44	100	0.014
Good		0	0.0	12	100.0	12	100	

Source: Primary Data, 2024.

The analysis derived from the chi-squared test yielded a  $p$ -value of 0.022 ( $< \alpha = 0.05$ ), indicating a significant association between open defecation behavior and the incidence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City.

### 2. The Relationship between Handwashing Behavior with Soap and the Incidence of Stunting in Lae Motong Village, Penanggalan District, Subulussalam City

Based on Table 6, 15 respondents (34.1%) with poor handwashing behavior using soap criteria experienced stunting, while 29 respondents (65.9%) did not experience stunting. On the other hand, respondents with good handwashing behavior using soap criteria did not experience stunting, totaling 12 respondents (100.0%).

The analysis from the chi-squared test yielded a  $p$ -value of 0.014 ( $< \alpha = 0.05$ ), signifying a significant association between handwashing behavior using soap and the incidence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City.

## DISCUSSION

### *The Relationship between Open Defecation Behavior and the Incidence of Stunting in Lae Motong Village, Penanggalan District, Subulussalam City*

Based on the results of the chi-squared test, a significant  $p$ -value of 0.022 was obtained, which is less than 0.05 ( $p < \alpha$ ), indicating a correlation between open defecation behavior and the occurrence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City. The research findings indicate that respondents with poor open defecation behavior criteria, totaling 30 respondents (83.3%), did not experience stunting, while 6 respondents (16.7%) did. Conversely, in the group with good criteria, 11 respondents (55.0%) did not experience stunting, while 9 respondents (45.0%) did.

The findings of this study are in line with research conducted by Oktia (2020 as cited in Arief Lopa *et al.*, 2022), which indicates that the practice of open defecation has been associated with an increased incidence of stunting. This association arises because human feces can serve as a breeding ground for flies or other insects, which may then

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spread bacteria onto household items, particularly eating utensils, thereby increasing the risk of diarrheal diseases. The rapid increase in the stunting index is also influenced by the frequent diarrhea experienced by children which of course has an impact on the absorption of nutrients from the body which can also disrupt the child's physical growth because the intestinal system cannot function normally. Furthermore, this discovery corroborates the findings of Yuliani Soeracmad (2019). She observed that individuals neglecting to safeguard their household wastewater drainage systems within the operational confines of the Wonomulyo Community Health Center in Polewali Mandar Regency face a 2.250-fold higher risk of stunting compared to those who take appropriate measures to safeguard their systems. These measures include refraining from open defecation in the sea, employing septic tanks, and residing in areas contiguous to those examined in Banggae District, Majene Regency.

Open defecation behavior, resulting from the lack of proper toilet facilities, is closely associated with a high incidence of diarrhea, which can significantly impact the growth and development of toddlers and may even lead to fatalities. Therefore, every household must have a toilet facility to safeguard the health of its members (Sasmita *et al.*, 2022).

It can be inferred that respondents exhibiting poor behavior in open defecation are more prevalent compared to those with good defecation practices. This prevalence is due to many respondents still disposing of feces outside of toilets, despite having access to them, and many still resorting to feces disposal in rivers or within the immediate vicinity of their homes. As indicated by the questionnaire responses obtained during interviews with respondents, many individuals have become accustomed to defecating outside of toilets due to family members' habitual practices of open defecation.

Hence, the habit of open defecation behavior significantly impacts the occurrence of stunting. The prevalence of improper fecal disposal among the populace can give rise to disease vectors, notably diarrhea, which can adversely affect toddlers. This is because the risk of stunting is higher in families with open defecation practices compared to those without. As a consequence of diarrhea, toddlers may experience excessive bowel movements, leading to disruptions in their growth and development. Therefore, it is imperative to educate the community on the importance of maintaining environmental sanitation, particularly by addressing open defecation behavior through the use of toilets, to mitigate the incidence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City.

The Relationship between Handwashing Behavior with Soap and the Incidence of Stunting in Lae Motong Village, Penanggalan District, Subulussalam City

Based on the chi-squared test results, a significant  $p$ -value of 0.014 was obtained, which is less than 0.05 ( $p < \alpha$ ),

indicating a relationship between handwashing behavior with soap and the occurrence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City.

These research findings align with a study conducted by Fahmi Hafid *et al.* (2016), which demonstrated a significant correlation between stunting occurrence in children aged 6 – 23 months and handwashing with soap ( $p < 0.005$ ). Similarly, findings by Rahma in Soeracmad *et al.* (2019) indicate that the habit of mothers or caregivers washing hands with soap before feeding or defecating is associated with a 15% reduction in the risk of stunting (Soeracmad *et al.*, 2019).

Furthermore, this study is also in line with the research conducted by Syam and S. Sunuh (2020) regarding the effects of handwashing, managing water to drink, and food on stunting in Central Sulawesi. The research findings indicate a correlation between handwashing behavior with soap and the occurrence of stunting. The dominant behavior of the community in practicing good handwashing behavior, both before and after activities, has a positive impact on children's nutritional status. Handwashing with soap is one of the preventive measures against diseases. Cleaning hands and fingers with flowing water and soap in the study are determinants of stunting. Research in Ethiopia shows that washing hands before interacting with toddlers, or before toddlers eat without washing hands with soap first, can be associated with the occurrence of stunting.

Toddlers may ingest food/drink containing pathogenic bacteria originating from dirty hands. Ingesting pathogenic bacteria can lead to digestive disorders and adversely affect the growth and development of young children. If toddlers frequently play on the floor or around the house without washing their hands with water and soap, they may become infected with diseases, including worm infestations. The consequences of such infestations include anemia and inhibited growth. Anemia arises due to the absorption of micronutrients such as folic acid, iron, riboflavin, vitamin B12, and vitamin A by nematodes. This can result in decreased appetite in young children. If left untreated, this infection can lead to malnutrition in toddlers, impacting both their physical and mental development. Ultimately, this condition hampers growth and serves as a trigger for stunting.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Based on the research findings, the following conclusions emerge.

1. The majority of respondents are aged between 26 and 35 years old, with their highest level of education being senior high school, engaged in household activities (housewife), and most of them have male toddlers.
2. There is a correlation between open defecation behavior and the occurrence of stunting in Lae Motong Village,

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Penanggalan District, Subulussalam City, with a *p*-value of 0.022.

3. There is a correlation between handwashing behavior with soap and the occurrence of stunting in Lae Motong Village, Penanggalan District, Subulussalam City, with a *p*-value of 0.014.

### RECOMMENDATIONS

Concerning the association between Community-Based Total Sanitation and the prevalence of stunting, the following recommendations can be put forward.

1. For Students

This research should serve as a reference regarding the correlation between Community-Based Total Sanitation and stunting. Future studies should delve deeper into the environmental sanitation factors associated with stunting if this research continues.

2. For the Community

It is advised that the community enhances the implementation of Community-Based Total Sanitation practices within the family environment to mitigate the incidence of stunting.

3. For Healthcare Professionals

Healthcare providers are encouraged to educate the community on Community-Based Total Sanitation practices to reduce the prevalence of stunting cases. Moreover, it is recommended for community health workers to intensify their monitoring of stunted toddlers every month.

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