

## An analysis of factors causing stunting in toddlers in the lahihuruk health center working area, west sumba regency

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### ABSTRACT

Stunting is a long-standing nutritional problem caused by low dietary intake over a long period due to inadequate feeding. Stunting can appear when a child is two years old or earlier. When a person grows up, stunting becomes one of the causes of their lack of productivity. It can also hinder economic growth increase poverty and widen inequality. Therefore, the nutritional intake of pregnant women, the lactation process, the adequacy of breast milk, complementary foods that contain enough nutrients, and how deworming is done for infants and toddlers should be reviewed from the beginning. These are thought to cause stunting. This study aims to determine the relationship between various factors that cause stunting in toddlers in the working area of the Lahihuruk Health Center, West Sumba Regency. This research was conducted in the Lahihuruk Community Health Center Working Area, West Sumba Regency, with a total sample of 60 stunting and healthy toddlers. The results showed that several factors cause stunting in toddlers, including maternal age, history of maternal illness during pregnancy, history of breastfeeding, complementary feeding, parenting history, environmental factors, and socioeconomic status. The results of chi-square analysis obtained a p-value of 0.000 where there is an association between these factors and the incidence of stunting in toddlers. It is hoped that health facilities can conduct home visits, provide additional food for stunted toddlers, and closely evaluate their development.

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## INTRODUCTION

Stunting is a condition in which children experience impaired growth and development due to prolonged malnutrition. This condition is characterized by below-standard height. Presidential Regulation Number 72 of 2021 concerning the Acceleration of Stunting Reduction states that stunting is a growth and development disorder caused by recurrent infections and malnutrition, characterized by height or length lower than the standards set by the minister responsible for

government health affairs (Khayati et al., 2020) (Almoraie et al., 2021). Parents often do not realize that their children are stunted (Hadina et al., 2022)(Christina et al., 2022)(Oktafiani & Witanti, 2024). Stunting is usually recognized when children turn two years old when they have lower height and weight than their peers, often experience health problems, and are less active. The National Team for the Acceleration of Poverty Reduction (TNP2K) (Rahayuwati et al., 2020) states that stunted toddlers and under-fives are more vulnerable to disease and have lower levels of intelligence. A study conducted (Angraini et al., 2019; Inamah et al., 2023) by the World Health Organization (WHO) (Handayani et al., 2022) found that Southeast Asia has the highest stunting rate in the world, with 31.9%, only behind Africa (33.1%). According to the Indonesian Health Profile in 2022, NTT topped the rankings for stunting in 2021 at 37.8%, followed by West Sulawesi province at 33.8% and Aceh province (Indanah & Ratna, 2020). However, stunting data from the West Sumba district health office in 2022 of 23.3% decreased from the previous year of 32.2%. However, two sub-districts have increased, namely the North West Sumba sub-district and North West Sumba sub-district. When a person grows up, stunting becomes one of the causes of their lack of productivity. It can also hinder economic growth, increase poverty, and widen inequality (Handayani et al., 2022) (Sekiyama et al., 2012). Therefore, it should be reviewed from the beginning about the nutrient intake of pregnant women; how the lactation process and the adequacy of breast milk; complementary foods that contain enough nutrients; and how deworming is done for infants and toddlers. This is thought to cause stunting (Bago et al., 2022) (Pries, Filteau, et al., 2019) (Pries, Rehman, et al., 2019). To answer the question of one of the causes of stunting, worm eggs must be examined microscopically. It is also necessary to find out whether ascariasis causes stunting, which means that the worms absorb nutrients that should be distributed to the organs in question. The author wants to conduct research with the title "Analysis of Factors Causing Stunting in Toddlers in the Working Area of the Lahihuruk Health Center, West Sumba Regency" because of this phenomenon.

## RESEARCH METHOD

Research design is a research design that is used as a reference in carrying out the research process, which aims to provide a clear and structured guide to researchers in conducting their research. The place used as a research site is the work area of the Wanukaka Health Center, West Sumba Regency. The number of samples used in this study was 60 toddlers. Inclusion criteria in this study are Toddlers in the working area of the Lahihuruk Health Center, Toddlers who were declared stunted by health center officers who have been measured, Parents of toddlers who understand and can read and write, and Parents of toddlers are willing to be respondents. read and write, Parents of toddlers are willing to be respondents. The sampling technique used The sampling technique used is the whole object that is targeted. Research instruments used The research instruments used in this study were a microscope for microscopic examination of worm eggs and a questionnaire to interview mothers of toddlers. The research instrument used 2 types of open and closed questionnaires, namely a questionnaire on the factors that cause stunting in toddlers including maternal age (Laksono & Kusri, 2020), parenting history, history of maternal illness during pregnancy, history of exclusive breastfeeding, additional food and environmental factors. The questionnaire was prepared by the researcher with validity and reliability tests conducted on mothers of toddlers in the working area of the Lahihuruk Health Center, West Sumba Regency. In addition to using questionnaires, we conducted fecal examinations on the toddlers to determine whether there was a worm infection. The survey validity test results showed that all surveys were valid and reliable ( $r$  more than 0.523,  $r$  more than 0.523, and  $r$  more than 0.605). Data were analyzed using the chi-square test to determine the relationship of factors causing stunting in toddlers after the toddler's stool was examined and parents were interviewed using a questionnaire.

## RESULTS AND DISCUSSIONS

### Result

Puskesmas Lahihuruk is an inpatient health center located in Taramanu village, Wanokaka sub-district, West Sumba Regency, East Nusa Tenggara. One of the working areas of the Lahihuruk Health Center was used as a research sample, where in this working area the incidence of stunting in toddlers was the highest. Table 1 shows that in the working area of the Lahihuruk Health Center, there were 47 stunted toddlers (78.4%) while 13 (21.6%) toddlers were not stunted. Table 2 shows that many factors cause stunting in toddlers including the age of toddlers, gender of toddlers, history of complementary feeding, history of parenting, history of exclusive breastfeeding, environmental factors, maternal knowledge of the nutritional status of toddlers, mother's age, history of disease during pregnancy, mother's education, mother's work, mother's income, mother's age, and worm infections (*Acharis Lumbricoide* and *Trichuris Trichura*). Table 3 explains that toddlers aged 1-2 years were 18.3%, 3-4 years old were 38.3%, and 5 years old were 43.4%. Table 4 explains that in the working area of Puskesmas Lahihuruk male toddlers (53.4%) are more than female toddlers (40.6%). The history of complementary feeding in Table 5 explains that as many as 25.2% of complementary feeding is good while 68.8% is bad, as well as the parenting patterns applied by parents in Table 6, where as many as 37.5% of parenting patterns are permissive, 31.3% of parenting patterns are authoritarian and only 25.2% of parents apply authoritative parenting. During the age period of 1-6 months, mothers who provide exclusive breastfeeding are only 25.2% in Table 7 while mothers who do not provide exclusive breastfeeding to toddlers when aged 1-6 months are 68.8%. based on Table 8, environmental factors, especially PHBS 68.8% are poor while 25.2% of parents apply good PHBS. Table 9 explains that as many as 68.8% of mothers do not understand the nutritional status of toddlers and only 25.2% have good knowledge about the nutritional status of toddlers. In the working area of the health center Lahihuruk, there are also several history of diseases suffered by mothers during pregnancy (Table 10) including, Malaria (25%), Typhoid Fever (6.6%), Anemia (50%), Hypertension (10%), ARI (8.4%). Based on Table 11, for the level of education, 33.4% of mothers had a college education, 6.6% high school, 10% junior high school, 25% elementary school, and 25% of mothers did not go to school. Table 12 explains that 28.4% of mothers of toddlers have office jobs and 71.6% are farmers. The income earned each month (Table 3) is 75% <Rp.1,000,000 and as much as 25% >Rp.1,000,000. From the stool examination results of stunted toddlers and healthy toddlers in Table 2.13, 73.3% of stunted toddlers were infected with *Ascharis lumbricoides* and *Trichuris Trichura* worms. Furthermore, 53.4% of mothers are <30 years old and 40.6% are >30 years old based on Table 9.

**Table 1.** Frequency distribution of the incidence of stunting in toddlers

Toddlers	Frequency	Percent
Stunted Toddlers	47	78.4
Healthy Toddlers	13	21.6
Total	60	100

### Frequency Distribution of Factors Causing Stunting in Toddlers

**Table 2.** Child age frequency distribution

Child Age	Frequency	Percent
1-2 years old	11	18.3
3-4 years old	23	38.3
5 years old	26	43.4
Total	60	100

**Table 3.** Frequency distribution of child's gender

Gender	Frequency	Percent
Male	34	53.4

Gender	Frequency	Percent
Female	26	40.6
Total	60	100

**Table 4.** Frequency distribution of breast milk complementary feeding history

Breast Milk Complementary Feeding History	Frequency	Percent
Good	16	25.2
Poor	44	68.8
Total	60	100

**Table 5.** Frequency distribution of parental history

Parental History	Frequency	Percent
Authoritative	20	31.3
Permissiveness	24	37.5
Authority	16	25.2
Total	60	100

**Table 6.** Frequency distribution of exclusive breastfeeding history

Exclusive Breastfeeding History	Frequency	Percent
Exclusive Breastfeeding	16	25.2
Nonexclusive	44	68.8
Total	60	100

**Table 7.** Frequency distribution of environment factors

Environment Factors	Frequency	Percent
Good	16	25.2
Poor	44	68.8
Total	60	100

**Table 8.** Frequency distribution of maternal knowledge on nutritional status of toddlers

Maternal Knowledge on Nutritional Status	Frequency	Percent
Less	44	68.8
Good	16	25.2
Total	60	100

**Table 9.** Maternal age frequency distribution

Maternal Age	Frequency	Percent
>30 Years Old	26	40.6
<30 Years Old	34	53.4
Total	60	100

**Table 10.** Frequency distribution of maternal disease history during pregnancy

Maternal Disease History during Pregnancy	Frequency	Percent
Malaria	15	25
Typhoid fever	4	6.6
Anemia	30	50
Hypertension	6	10
Upper respiratory tract infection	5	8.4
Total	60	100

**Table 11.** Frequency distribution of maternal education

Maternal Education	Frequency	Percent
Not at School	15	25
Elementary School	15	25
Middle School	6	10
Senior High School	4	6.6
College	20	33.4
Total	60	100

**Table 12.** Occupational frequency distribution

Occupational	Frequency	Percent
Office Workers	17	28.4
Farmers	43	71.6
Total	60	100

**Table 13.** Frequency distribution of income

Income	Frequency	Percent
<IDR. 1.000.000	45	75
>IDR.1.000.000	15	25
Total	60	100

**Table 14.** Frequency distribution of worm infection

Worm Infection	Frequency	Percent
Negative	16	26.6
Positive	44	73.3
Total	60	100

### Chi Square analysis of factors causing the incidence of stunting in toddlers in the Lahihuruk Health Center Working Area, West Sumba Regency

**Table 15.** Relationship between maternal age and incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Mother's age	<30 Years	18	8	26	0,034
	>30 Year	29	5	34	
	Total	47	13	60	

**Table 16.** Relationship between maternal disease history and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Mother's Disease History	Malaria	19	10	29	0.001
	Typhoid fever	0	0	0	
	Anemia	28	0	28	
	Hypertension	0	0	0	
	Upper respiratory tract infection	0	3	3	
Total		47	13	60	

**Table 17.** Relationship between mother's education and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Maternal Education	Not at School	8	7	15	0.010
	Elementary School	15	0	6	
	Middle School	6	0	4	
	Senior High School	14	0	20	
	College	4	6	15	
	Total		47	13	

**Table 18.** Relationship between maternal labor and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Mother's Occupation	Office Workers	11	6	17	0,007
	Farmers	36	7	43	
	Total	47	13	60	

**Table 19.** Relationship between maternal income and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Mother's Income	<IDR. 1.000.000	32	13	45	0.019
	>IDR. 1.000.000	15	0	15	
	Total	47	13	60	

**Table 20.** Relationship between maternal knowledge of toddler nutrition status and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Maternal Knowledge of Toddler Nutrition Status	Less	3	13	16	0.000
	Good	44	0	44	
	Total	47	13	60	

**Table 21.** Relationship between environmental factors and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Environmental Factors	Good	3	13	14	0.000
	Bad	44	0	44	
	Total	47	13	60	

**Table 22.** Relationship between exclusive breastfeeding and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Exclusive breastfeeding history	Exclusif	3	13	16	0.000
	Not Exclusive	44	0	44	
	Total	47	13	60	

**Table 23.** The Relationship between parenting history and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
History of Parenting	Authoritative	20	0	20	0.000
	Permissiveness	24	0	24	
	Authority	3	13	16	
	Total	47	13	60	

**Table 24.** Association of worm infection with the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Worm Infections	Negatif	3	13	16	0.000
	Positif	44	0	44	
	Total	47	13	60	

**Table 25.** Relationship between complementary feeding and the incidence of stunting in toddlers

Variables	Category	Incidence of Stunting			P. Value
		Stunting	Not Stunted	Total	
Feeding history	Good	3	13	16	0.000
	Poor	44	0	44	
	Total	47	13	60	

Based on Table 15, it is found that there is a significant relationship between maternal age and the incidence of stunting in toddlers in the Lahihuruk Health Center Area, West Sumba Regency with a P-value of 0.034. Table 16 explains that there is a relationship between the history of maternal illness and the incidence of stunting in toddlers, where the p-value is 0.001. The socioeconomic status of the mother also has a significant influence on the incidence of stunting,

low economic status in the stunting group also has an impact on low hygiene and sanitation (19). In table 17 the results show that maternal knowledge of the nutritional status of toddlers also has a relationship with the incidence of stunting in toddlers, where the p-value is 0.000. environmental factors and exclusive breastfeeding history also influence the incidence of stunting in toddlers, where the p-value results are both 0.000, which means that there is a relationship between environmental factors and exclusive breastfeeding history on the incidence of stunting in toddlers (Table 18, and 19). parenting patterns, history of complementary feeding are also factors that influence the occurrence of stunting, as evidenced by the results of the p-value is 0.000. in addition, from the results of fecal examinations in stunted toddlers and healthy toddlers, stunted toddler feces samples were positively infected with *Ascaris lumbricoides* and *Trichuris Trichiura* worms (table 3.10 P-Value 0.000). As is known that poor PHBS is also at risk of stunting, as evidenced by the results of interviews with mothers of toddlers that because they are in a hurry mothers forget to wash their hands when preparing meals for children, do not pay attention to the cleanliness of food and places to eat toddlers. In Table 24 and table 25, it is found that improper provision of complementary foods also affects the occurrence of stunting in toddlers, respondents explained that enough with porridge and water toddlers are full and no longer fussy or crying, given eggs, vegetables, or meat only occasionally or even once every 4 days if the mother has more time, toddlers are often given snacks, cakes, or biscuits so that they are calmer and mothers are more free at work. The p-value result obtained is 0.000, which means that there is a relationship between the history of complementary feeding with the incidence of stunting in the Lahihuruk Health Center Working Area, West Sumba Regency. Based on the gender of toddlers, the incidence of stunting was more prevalent among male toddlers (70.2%) than female toddlers (29.7%). Based on the age of toddlers in Table 3.13 who experienced the most stunting in toddlers aged 3-4 years, as many as 46.8%, the p-value result was 0.050, which means that there is a relationship between the age of toddlers and the incidence of stunting in the Lahihuruk Health Center Working Area, West Sumba Regency.

## Discussion

Stunting is a long-term nutritional problem caused by low food intake over a long period due to inappropriate feeding. Stunting usually occurs after the age of two and can start when the fetus is still in the womb. In anthropometric standards for the assessment of a child's nutritional status, stunting is defined as nutritional status associated with the PB/U or TB/U index. The result should be at a threshold (Z-Score) below -2 SD for stunting and below -3 SD for very short/very stunted. Stunting is defined as short stature caused by prolonged nutritional deficiencies (3). One of the most common methods for assessing the nutritional status of under-fives is anthropometry. A wide variety of measurements of body dimensions and composition related to age and nutritional level are used in anthropometry. The most commonly used indices include weight-for-age (BB/U), height-for-age (TB/U), and weight-for-height (BB/TB), all of which are represented by standard deviation Z units. If a toddler is weighed, measured for height, and compared to the standard, the result will be considered below normal. The results indicate that a stunted toddler will be physically shorter than other toddlers of the same age (10). In children with severe stunting, there is a long-term decline in physical and mental development, which prevents them from learning well in school. Compared to children of normal height, children with stunting tend to take longer to enter school and are absent from school more often.

This has an impact on the child's future success. Stunted toddlers in the Lahihuruk Health Center Working Area of West Sumba Regency amounted to 78.4% while the total sample of healthy toddlers was 21.6%. Children's health and development will be greatly affected by stunting. One of the main factors that cause stunting can interfere with intellectual growth and development. The factor causing the risk of toddlers with stunting in the Lahihuruk Health Center Working Area is a history of inadequate breastfeeding, where based on the results of the interview 68.8% of mothers did not exclusively breastfeed because they were busy helping their husbands

earn additional income for the family. The results of a study by Rita et al (14) showed that many stunted toddlers did not receive colostrum. Exclusive breastfeeding was also associated with colostrum feeding (14). Another factor is the history of inappropriate complementary feeding, mothers say as long as the toddler is full and not fussy without paying attention to nutritional intake according to the child's age. This is in line with research conducted by Rita, et al (2019) Children who received complementary foods not at the right time to start had a 2.8 times greater risk of stunting (z score <-2) (14). Mothers with a history of malaria and anemia during pregnancy also cause children to be at risk of stunting, this is because when the mother is pregnant and is attacked by a disease, the fetus in the womb will be disrupted in growth and development, the effects of treatment can also have an impact on the womb, risking premature birth and suboptimal growth, especially in the first trimester. Rahayu (2021) explains that anemia in pregnancy increases the risk of abortion, preterm labor, obstacles to fetal growth and development, easy infection, the threat of cordial decompensation (Hb < 6 gr%), molahidatidosa disease, hyperemesis gravidarum, antepartum bleeding, and premature rupture of membranes.

In addition, the baby's birth weight will be affected by high or low Hb levels during pregnancy because it can interfere with fetal growth (15), so there is an association between a history of anemia during pregnancy and the incidence of stunting in toddlers (P-value: 0.001). Parenting can also be one of the factors causing stunting in toddlers, where in Table 3.9 it is explained that there is a relationship between parenting patterns and the incidence of stunting in toddlers (P-value: 0.000).

Parenting can be defined as the way and style of interaction between parents and children. Parents provide guidance that prepares children for the environment and culture in which they live. It shapes children's current and future morals, principles, and behaviors. The results of research in the Lahihuruk Health Center Working Area, West Sumba Regency obtained data on the highest parenting pattern in toddlers is permissive parenting (37.5%), this is a parenting pattern with low demands and high responsiveness. Parents in this parenting pattern want to be their children's friends, but the impact of applying this parenting pattern is that in the end the child will be less able to manage themselves, and more often do bad habits because of the freedom given by their parents. Evidenced by the results of interviews with respondents that even though they already know their toddlers are stunted, good nutritional intake is not the main concern, some argue that as long as the child is not sick, it means that his nutritional intake is good. followed by authoritarian parenting as much as 31.3% and Authoritative as much as 25.2% with a p-value of 0.000 which means that there is a relationship between parenting patterns and the incidence of stunting in toddlers in the Lahihuruk Health Center Working Area, West Sumba Regency.

Maternal age also has a significant effect on the incidence of stunting in toddlers, the analysis results obtained a P-value of 0.034. This could be a factor causing stunting in toddlers where the mother's age <30 years (53.4%) is immature in preparing for child growth and development, some respondents explained that age is not a benchmark in parenting, because if you are ready to get married then it is better to get married and have children. According to research conducted by Quarshie (2014), teenage mothers tend to be incomplete in breastfeeding their babies (16). This is because they are not sensitive to their babies. After all, they are emotionally unstable and feel disturbed while mothers who are more than 35 years old tend to have no enthusiasm to take care of their pregnancies due to the aging process, which results in a decrease in nutrient absorption (18).

## CONCLUSION

It is recommended to improve the skills of cadres and health workers to conduct home visits to stunted toddlers to help control and improve nutritional status, PHBS, and knowledge related to stunting toddlers.

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