

# Analysis of Factors Related to Nutritional Status in Toddlers with Stunting

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## ABSTRACT

**Background:** Stunting is a condition in which toddlers are shorter than average for their age. Stunting is a serious nutritional problem. This condition can have serious impacts on children's physical, cognitive, and social development, as well as on the quality of human resources in the future. This study aimed to analyze factors related to nutritional status in toddlers with stunting.

**Methods:** This study employed a quantitative approach with a cross-sectional analytical design. The sample size was 30 stunted toddlers aged 3-5 years, using a cluster sampling method. A questionnaire was used as the research instrument. Primary data were analyzed using the chi-square statistical test.

**Results:** The results of the Univariate analysis showed that 90% of toddlers were not LBW, 76.7% did not do IMD, 56.7% of toddlers did not receive exclusive breastfeeding, 96.7% of toddlers did not have ISPA, 50% of toddler mothers had low education, 80% of family income was  $\leq$ UMR and 86.7% of families followed CHLB. The results of the bivariate analysis showed that there was a significant relationship between LBW and nutritional status in stunted toddlers ( $p$  value = 0.014), while other independent variables did not have a significant relationship.

**Conclusion:** Analysis of the relationship between low birth weight (LBW)  $p = 0.014$  shows a statistically significant relationship. Analysis of the relationship between Early Breastfeeding Initiation (EBI), Exclusive Breastfeeding, Acute Respiratory Infection (ARI) incidence, Mother's Education Level, Family Income, and the implementation of Clean and Healthy Living Behaviors (CHLB) with the nutritional status of stunted infants in this study showed no significant relationship, indicating that the provision of EBF to the study participants did not directly influence the nutritional status of stunted infants.

## INTRODUCTION

Stunting is one of the targets of the Sustainable Development Goals (SDGs) included in the second sustainable development goal, which is to eliminate hunger and all forms of malnutrition by 2030 and achieve food security. The target set is to reduce the stunting rate to 40% by 2025. Stunting can occur as a result of malnutrition, particularly during the first 1,000 days of life (Muchlis et al., 2022).

According to UNICEF, stunting is a condition in which toddlers are shorter than average for their age (United Nations Children's Fund (UNICEF, 2020). Stunting is a serious nutritional problem. This condition can have a serious impact on children's physical, cognitive, and social development, as well as on the quality of human resources (HR) in the future. Stunting is diagnosed based on medical history, physical examination, and anthropometric measurements. The anthropometric criteria for stunting are based on the height-for-age or weight-for-age index (HAZ or WAZ)  $<-2$  SD according to the WHO 2006 growth curves for children aged 0-5 years (Ministry of Health, 2022).

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Stunting reflects chronic malnutrition and can have long-term effects, including growth retardation, reduced cognitive and mental abilities, susceptibility to disease, low economic productivity, and poor reproductive outcomes (Asgedom et al, 2024). Stunting occurs when children do not receive adequate nutrition at all stages of their lives (United Nations Children's Fund/ (UNICEF, 2020). The issue of stunting is not merely about knowledge of nutritional needs and food management but also about behavioral change. This is crucial because behavioral change has a strong influence on various aspects of life, such as knowledge, attitudes, and cultural norms that are deeply ingrained and considered routine in daily activities (Trustisari, 2022). Additionally, the issue of stunting is not only focused on health-related problems but is closely linked to social issues such as poverty, lack of access to education services, violence against women, child neglect, childcare, early marriage, and other social issues (Nurjanah et al., 2024).

According to the World Health Organization (WHO), in 2024 the prevalence of stunting in children worldwide reached 23.2% in children under the age of 5, which means that around 150.2 million toddlers are stunted (World Health Organization, 2024). Currently, based on data from UNICEF and WHO, Indonesia's stunting prevalence rate ranks 27th out of 154 countries with stunting data, placing Indonesia 5th among Asian countries (Andani et al., 2024).

In Indonesia, the prevalence of stunting remains quite high despite a decline over the past decade. According to national survey data, the prevalence of stunting reached 37.6% in 2013, decreasing to 19.8% in 2024.

The prevalence of stunting varies significantly across provinces. The lowest rate was recorded in Bali Province (8.7%), while the highest was in East Nusa Tenggara Province (37%) (BKPK, 2025). This prevalence can be broken down into a stunting rate of 27.2% and a severe stunting rate of 9.8% (SSGI, 2025).

Based on the latest data from the 2024 Indonesian Nutrition Status Survey (SSGI), the prevalence of stunting in Kupang Regency reached 39.5%, up from 38.4% in 2023 (FaktaHukumNTT, 2025). With this figure, Kupang Regency ranks sixth highest in stunting prevalence in East Nusa Tenggara Province (NTT) (KupangBerita.Com, 2025). Based on interviews with nutrition officers at the Oekabiti Health Center, the number of stunted children in Amarasi Sub-district in 2024 was 324 infants, representing a percentage of 27.6%. Kupang Regency itself is classified as an area with a relatively high prevalence of stunting, indicating that stunting remains a pressing public health issue that requires immediate attention Kupang Regency, particularly in Amarasi District, stunting remains a health issue that needs attention. Although many efforts have been made to reduce stunting cases by the government and health services, particularly through the provision of supplementary food (PMT). Factors contributing to this issue include insufficient community awareness of the importance of maintaining clean living habits, limited access to information, and unstable family economic conditions, which further restrict the ability to meet children's basic needs. Factors influencing stunting in Amarasi Subdistrict include adequate nutrient-rich food intake, appropriate childcare practices, proper sanitation, and insufficient community knowledge about the importance of balanced nutrition. According to Anjani et al. (2024), the causes of stunting include inadequate nutrient intake in infants, infectious diseases, maternal factors such as poor nutrition during preconception, pregnancy, and lactation, genetic factors, exclusive breastfeeding, food availability, socioeconomic factors, maternal education level, maternal nutrition knowledge, and environmental factors.

Stunting always begins with weight faltering, which can occur in utero and continue after birth. Research in Malawi shows that babies born shorter will continue to experience length faltering during infancy (Ministry of Health of the Republic of Indonesia, 2022). The strongest predictor of stunting at 12 months of age in that study was growth retardation occurring in the first three months of life. If the average weight-for-age (WFA) at weigh-ins during the first three months after birth is less than  $<-1$  SD, the risk of stunting at 12 months of age is 14 times higher (Ministry of Health of the Republic of Indonesia, 2022)

Therefore, stunting can be addressed starting from the pre-conception period, the first 1000 days of life (HPK), improving clean and healthy living behaviors (CHLB), special interventions during critical periods, nutrition and health education, sanitation, and clean water (Maryuni et al., 2024).

Health workers also play an important role in preventing stunting by providing nutritional counseling, promoting exclusive breastfeeding, and teaching proper feeding practices. With the help of health workers, the community's understanding of stunting has improved (Hanifah et al., 2024).

## METHODS

The research design in this study is quantitative with a descriptive analytical design using a cross-sectional method. Cross-sectional research is a type of analytical research aimed at identifying relationships between independent variables (factors suspected to be influential) and dependent variables (stunting) simultaneously at a single point in time (Anggredi, 2022). This design is used to determine the relationships between variables within a population based on the conditions prevailing at the time of data collection.

## RESULTS

### Factors associated with nutritional status in toddlers with stunting in the working area of the Oekabiti Community Health Center, Amarasi District, Kupang Regency, East Nusa Tenggara Province in 2025

Table 1. Characteristics of Stunted Toddlers Based on Gender

Characteristics of Toddlers	Frequency (n)	Percentage (%)
a. Gender		
Male	17	56,7
Female	13	43,3
Total	30	100
b. Number of Family Members		
< 3 people	0	0
≥ 3 people	30	100
Total	30	100
c. Child's Age (months)		
36-47 months	19	63,3
48-59 months	11	36,7
≥ 60 months	0	0
Total	30	100

The data was then analyzed using univariate and bivariate analysis as follows:

## UNIVARIATE ANALYSIS

### Frequency Distribution based on Low Birth Weight (LBW)

Table 2. Frequency of Stunted Toddlers Based on Low Birth Weight Status

Status LBW	Frequency (n)	Percentage (%)
Low birth weight	3	10
Not low birth weight	27	90
Total	30	100

Most of the stunted toddlers in this study did not have a history of low birth weight (LBW), with 90% having LBW at birth and 10% not having LBW at birth.

**Frequency Distribution based on Early Breastfeeding Initiation (EBI)**

Table 3. Frequency Distribution of Stunted Toddlers Based on IMD Status

Status EBI	Frequency (n)	Percentage (%)
Did not perform EBI	7	23,3
Performed EBI	23	76,7
Total	30	100

Most of the mothers in this study had performed Early Breastfeeding Initiation (EBI), namely 76.7%. Meanwhile, 23.3% did not perform EBI.

**Frequency Distribution based on Exclusive Breastfeeding**

Table 4. Characteristics of Stunted Toddlers Based on Exclusive Breastfeeding Status

Exclusive breastfeeding status	Frequency (n)	Percentage (%)
Not exclusive	13	43,3
Exclusive	17	56,7
Total	30	100

Most of the stunted toddlers in this study were found to have been exclusively breastfed 56.7%, while 43.3% were not exclusively breastfed.

**Frequency Distribution based on Acute Respiratory Infection (ARI) History**

Table 5. Characteristics of Stunted Toddlers Based on History of Respiratory Tract Infections

Acute Respiratory Infection (ARI) History	Frequency (n)	Percentage (%)
Not ARI	29	96,7
ARI	1	3,3
Total	30	100

The results showed that most toddlers with stunting didn't have a history of acute respiratory infections (ARI), which was 96.7%, while only 3.3% had ARI.

**Frequency Distribution based on Mother's Education Level**

Table 6. Characteristics of Stunted Toddlers Based on Mother's Education Level

Mother's Education Level	Frequency (n)	Percentage (%)
Low	15	50
High	15	50
Total	30	100

Fifty percent of mothers of stunted toddlers have a low level of education (no schooling, elementary school, and junior high school), while the other 50% have a high level of education (high school and above).

**Frequency Distribution based on Family Income**

Table 7. Characteristics of Stunted Toddlers Based on Family Income

Family Income	Frequency (n)	Percentage (%)
Less than minimum wage	24	80
More than minimum wage	6	20
Total	30	100

The high proportion of stunted toddlers come from families with incomes below the minimum wage, which is 80%. Only 20% of stunted toddlers come from families with incomes above the minimum wage.

### Frequency Distribution based on Clean and Healthy Living Behaviors (CHLB)

Table 8. Characteristics of Stunted Toddlers Based on Family CHLB

CHLB	Frequency (n)	Percentage (%)
CHLB not good	26	86,7
CHLB good	4	13,3
Total	30	100

### BIVARIATE ANALYSIS

#### Analyzing the Relationship Between Low Birth Weight (LBW) and Nutritional Status in Stunted Toddlers

Table 9. Analysis of the Relationship Between Low Birth Weight and Nutritional Status in Stunted Toddlers

Birth Status	Nutritional Status of Stunted Toddlers						Sum		p-value
	Good		Poor		Bad		N	%	
	N	%	N	%	N	%			
LBW	0	0	1	33,3	2	66,7	3	100	0,014
Non-LBW	10	37	15	55,6	2	7,4	27	100	
Total	10	37	16	53,3	4	13,3	30	100	

Based on Table 9, it shows that the presentation of BBLR birth status with the BBLR category and the nutritional status of stunted toddlers with good nutrition is 0% or no toddlers, the nutritional status of stunted toddlers with poor nutrition is 33.3%, and with severe malnutrition is 66.7%. Meanwhile, the percentage of non-LBW among stunted infants with good nutrition is 37%, poor nutrition is 55.6%, and severe malnutrition is 7.4%. Based on the statistical test (chi-square) with a p-value of 0.014, where  $p \leq 0.05$ , it can be concluded that there is a significant association between BBLR and nutritional status in stunted infants.

#### Analyzing the Relationship Between Early Breastfeeding Initiation (EBI) and Nutritional Status in Stunted Toddlers

Table 10. Analysis of the Relationship Between Early Breastfeeding Initiation (EBI) and Nutritional Status in Stunted Toddlers.

IMD Status	Nutritional Status of Stunted Toddlers						Sum		p-value
	Good		Poor		Bad		N	%	
	N	%	N	%	N	%			
IMD	1	14,3	4	57,1	2	28,6	7	100	0,271
No IMD	9	39,1	16	52,2	2	8,7	23	100	
Total	10	33,3	20	53,3	4	13,3	30	100	

Based on Table 10, it shows that the percentage of IMD in relation to the nutritional status of stunted children under five years of age is 14.3% for good nutrition, 57.1% for poor nutrition, and 28.6% for severe malnutrition. Meanwhile, the percentage of non-IMD among stunted children with good nutrition is 39.1%, moderate malnutrition is 52.2%, and severe malnutrition is 8.7%. Therefore, it can be concluded that the Chi-Square test results between the IMD variable and nutritional status in stunted children yielded a p-value of 0.271. Since the p-value is greater than 0.05, it can be concluded that there is no significant association between IMD and nutritional status in stunted children.

**Analyzing the Relationship Between Exclusive Breastfeeding and Nutritional Status in Toddlers Suffering from Stunting**

Table 11. Analysis of the Relationship Between Exclusive Breastfeeding and Nutritional Status in Stunted Toddlers

Exclusive Breastfeeding	Nutritional Status of Stunted Toddlers						Sum		p-value
	Good		Poor		Bad		N	%	
	N	%	N	%	N	%			
Exclusive	6	35,3	9	52,9	2	11,8	13	100	0,942
Non-Exclusive	4	30,8	7	53,8	2	15,4	17	100	
Total	10	33,3	16	53,3	4	13,3	30	100	

Based on Table 11, it shows that the percentage of non-exclusive breastfeeding on the nutritional status of stunted toddlers with good nutrition is 30.8%, malnutrition is 53.8%, and 15.4% for severe malnutrition. For exclusive breastfeeding alone, the nutritional status of stunted infants with good nutrition is 35.3%, poor nutrition is 52.9%, and severe malnutrition is 11.8%. The results of the Chi-Square test between exclusive breastfeeding and the nutritional status of stunted infants showed  $p = 0.942$ . Since the  $p$ -value is greater than 0.05, it can be concluded that there is no significant association between exclusive breastfeeding and the nutritional status of stunted infants.

**Analyzing the Relationship Between Acute Respiratory Infections (ARI) and Nutritional Status in Stunted Toddlers**

Table 12. Analysis of the Relationship Between Acute Respiratory Infection (ARI) Incidence and Nutritional Status in Stunted Toddlers

History of ISPA	Nutritional Status of Stunted Toddlers						Sum		p-value
	Good		Poor		Bad		N	%	
	N	%	N	%	N	%			
ISPA	0	0	1	100	0	0	1	100	0,636
No ISPA	10	34,5	15	51,7	4	13,8	29	100	
Total	10	33,3	16	53,3	4	13,3	30	100	

From Table 12, it can be seen that the percentage of acute respiratory infection (ARI) history among stunted toddlers with good nutrition is 0% or no toddlers, the percentage of ARI among stunted toddlers with poor nutrition is 100%, and 0% or no toddlers for stunted toddlers with bad nutrition. Meanwhile, the percentage of infants without ARI among stunted infants with good nutrition is 34.5%, 51.7% for those with poor nutrition, and 13.3% for those with severe malnutrition. With a chi-square test  $p$ -value of 0.636, since the  $p$ -value is greater than 0.05, it can be concluded that there is no association between the incidence of ISPA and nutritional status in stunted infants.

**Analyzing the Relationship Between Mothers' Educational Levels and the Nutritional Status of Stunted Toddlers**

Table 13. Analysis of the Relationship Between Mother's Education Level and Nutritional Status in Stunted Toddlers

Mother's Education Level	Nutritional Status of Stunted Toddlers						Sum		p-value
	Good		Poor		Bad		N	%	
	N	%	N	%	N	%			
Low	4	26,7	9	60	2	13,3	15	100	0,723
High	6	40	7	46,7	2	13,3	15	100	
Total	10	33,3	16	53,3	4	13,3	30	100	

Table 14. shows that the percentage of families with low income and good nutritional status in stunted toddlers is 33.3%, while 50% of stunted toddlers have poor nutritional status and 16.7% have very poor nutritional status. Meanwhile, the percentage of families with high income and stunted infants with good nutrition is 33.3%, stunted infants with poor nutrition is 66.7%, and stunted infants with very poor nutrition is 0% or no infants. From the statistical test using the chi-square test, the p-value was 0.723, which is greater than 0.05. Therefore, it can be concluded that there is no significant relationship between family income and the nutritional status of stunted infants.

### Analyzing the Relationship Between Clean and Healthy Living Behaviors (CHLB) and Nutritional Status in Stunted Toddlers

Table 15. Analysis of the Relationship Between Clean and Healthy Living Behaviors (CHLB) and Nutritional Status in Stunted Toddlers

CHLB	Nutritional Status of Stunted Toddlers						Sum		p-value
	Good		Poor		Bad				
	N	%	N	%	N	%	N	%	
CHLB Good	1	25	3	75	0	16,7	24	100	0,572
CHLB Not Good	9	34,6	13	50	4	15,4	6	100	
Total	10	33,3	16	53,3	4	13,3	30	100	

Table 15 shows that the percentage of Clean and Healthy Living Behaviors (CHLB) with a good CHLB category and stunted toddler nutritional status with good nutrition is 25%, stunted toddler nutritional status with poor nutrition is 75%, and stunted toddler nutritional status with very poor nutrition is 0% or no toddlers. Meanwhile, the percentage of CHLB categorized as not yet CHLB and the nutritional status of stunted infants with good nutrition is 34.6%, the nutritional status of stunted infants with poor nutrition is 50%, and the nutritional status of stunted infants with very poor nutrition is 15.5%. From the statistical test using the chi-square test, the p-value was 0.572, which is greater than 0.05. Therefore, it can be concluded that there is no relationship between CHLB and the nutritional status of stunted infants.

## DISCUSSION

### Univariate Analysis

The results of research conducted at the Oekabiti Community Health Center show that of the total 30 stunted toddlers, 10% were born with low birth weight (LBW), while 90% were born with normal birth weight. This means that babies born weighing less than 2,500 grams are more likely to experience malnutrition or undernourishment when they experience stunting compared to babies born at a normal weight. This shows that the majority of respondents in this study did not experience LBW at birth. However, the proportion of toddlers with LBW still needs attention because, although the number is small, children with LBW are at greater risk of growth disorders, including stunting.

The results of this study are consistent with research conducted by (Fauziah et al., 2024). Low birth weight (LBW) is consistently associated with stunted growth or reduced height (Ministry of Health, 2019). In the study conducted by (Fitria et al., 2024), a relationship was observed between low birth weight (LBW) and stunting in children under 5 years of age in the village. Out of a total of 74 respondents, 77.8% had a history of LBW, while 22.2% did not have stunting.

Based on the results of the study, 76.7% of stunted toddlers received early breastfeeding initiation (EBI), while 23.3% of stunted toddlers did not receive EBI. This aligns with the study conducted by (Lubis et al., 2018), which stated that there is no significant association between EBI and stunting, but contradicts the study conducted by (Yani et al., 2024) In the case group without EBI, the prevalence was 57.8%, higher than in the control group at 42.2%, and the risk of stunting in the case group with EBI was 40.7%

lower than in the control group at 59.3%. Statistical analysis revealed a significant association between EBI and the occurrence of stunting.

The study found that of the total 30 toddlers suffering from stunting, 56.7% were exclusively breastfed, while 43.3% were not exclusively breastfed during the first six months of their lives. This aligns with the study conducted by (Nuraeni et al., 2024), which stated that 67.4% of stunted infants were not exclusively breastfed, while 32.6% were exclusively breastfed, and there was no significant association between the history of exclusive breastfeeding and the occurrence of stunting. In contrast, a study conducted by (Supriyatun et al., 2024) on 95 stunted children, of whom 55 were exclusively breastfed and 40 were not, found a significant association between exclusive breastfeeding and stunting in infants.

From the results of the study, it was found that most of the stunted toddlers in this study did not have a history of ARI, namely 96.7% of toddlers, and only 3.3% of toddlers had a history of ARI. This aligns with the study conducted by (Aini et al., 2022), which reported that there was no significant association between a history of diarrhea and ARI and the occurrence of stunting in children aged 3–5 years. However, this contradicts the study conducted by (Maro et al., 2023), which states that there is a relationship between a history of acute respiratory infections and stunting in infants based on ARI and height, where ARI in the short category was 0 infants (0%) and in the very short category was 2 infants (100%).

The results of the study indicate that stunted toddlers in this study have a balanced distribution based on the mother's level of education. Fifty percent of mothers have a low level of education, and 50% of mothers have a high level of education. This is in line with the study conducted by (Willyanto & Ramadhani, 2023), which states that the mother's level of education is not very significant in relation to the nutritional status of stunted children. In contrast to the study conducted by (Husnaniyah et al., 2020), there is a relationship between the mother's educational level and the incidence of stunting, where the lower the mother's educational level, the greater the risk of the infant experiencing stunting.

The results of the study show that most families of toddlers experiencing stunting have incomes below the Regional Minimum Wage (UMR), namely 80% of families, while only 20% of families have incomes above the UMR. This aligns with research conducted by (Tsaratifah, 2020), which states that family income is not related to stunting incidents because the majority of residents in Ampel Subdistrict, Surabaya City, have low to middle incomes. Out of 19 respondents, 14 had family incomes dominated by households earning below the established UMR. This could be a factor in the lack of correlation between the two. In contrast, research by (Maiseptya Sari et al., 2020) states that 37.5% of children experience stunting, 62.5% do not experience stunting, 31.2% have low income, 53.1% have moderate income, and 15.6% have high income. Therefore, there is a relationship between family income and stunting incidence.

The results of the study indicate that the majority of families with stunted toddlers in this study have poor clean and healthy living behaviors (CHLB), namely 86.7%, while only 13.3% are classified as having good CHLB. This study aligns with the research by Danis & Sari (2023), which concluded that not all CHLB indicators are associated with stunting, but it contradicts the findings of Zakiah et al. (2024), who stated that one of the conditions resulting from the neglect of CHLB implementation is stunting.

## **Bivariate**

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers with Low Birth Weight**

Based on the results of research conducted at the Oekabiti Community Health Center, it can be concluded that there is a statistically significant relationship between the variables of low birth weight (LBW) and the nutritional status of toddlers with stunting ( $p = 0.014$ ). This means that infants born with low birth weight (LBW) tend to have poorer nutritional status when experiencing stunting compared to infants who are not LBW. This study aligns with the research by (Fitria et al., 2024) titled "The Relationship Between Low Birth Weight (LBW) and Stunting in Children Under 5 Years of Age." This study was conducted on 64 respondents using correlation coefficient analysis, yielding a Sig. deviation

from linearity between low birth weight (LBW) and stunting of 0.001 (less than 0.05), indicating a significant association between low birth weight (LBW) and stunting in children under 5 years of age. This is in agreement with (Rahayu et al., 2018), who stated that the impact of LBW will continue across generations. A child who experiences LBW will also experience growth deficits (poor anthropometric measurements) in adulthood. For women born with LBW, there is a high risk that they will also become stunted mothers, thereby increasing the risk of giving birth to LBW babies. The findings of Rahayu et al.'s study in Banjar District revealed that infants born with low birth weight (LBW) are at risk of stunting. In many cases, the independent efforts of mothers result in giving birth to children with LBW as a risk factor for stunting (Muchlis et al., 2022). Low birth weight (LBW) <2,500 grams and inadequate nutritional intake during the golden age are more likely to result in stunting (Sari et al., 2025).

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers with a History of IMD**

Based on the results of bivariate analysis between the Early Breastfeeding Initiation (IMD) variable and the nutritional status of toddlers as measured by stunting status, a Pearson Chi-Square value of 2.609 was obtained with a degree of freedom (df) = 2 and a significance value of 0.271. This significance value is greater than the  $\alpha$  threshold of 0.05, indicating that there is no statistically significant relationship between the provision of EBF and the nutritional status of infants in the service area of the Oekabiti Health Center.

These results are also supported by a Likelihood Ratio value of 2.555 ( $p = 0.279$ ) and a Linear-by-Linear Association value of 2.432 ( $p = 0.119$ ), both of which also indicate no significant relationship. Therefore, the null hypothesis ( $H_0$ ) stating that there is no relationship between IMD and child nutritional status cannot be rejected, or in other words, there is insufficient statistical evidence to conclude that there is a correlation between the implementation of IMD and the nutritional status of infants in the working area of the UPTD Puskesmas Oekabiti.

The results of this study are in line with the research conducted by (Lubis et al., 2018) "The Relationship Between Several Factors and Stunting in Low Birth Weight Infants." This study was conducted on 24 respondents, with bivariate analysis showing that the provision of IMD was not significantly associated with stunting ( $X^2 = 0.286$ ,  $p = 0.593$ ). However, this differs from the results of the study conducted by (Yani et al., 2024) titled "The Relationship Between Early Breastfeeding Initiation (IMD), Exclusive Breastfeeding, Antenatal Care (ANC) on the Occurrence of Stunting in Infants at the Meurah Dua Health Center, Meurah Dua Subdistrict, Pidie Jaya District," which was conducted on 100 respondents, statistical tests revealed a significant association between EBI and the occurrence of stunting ( $p$ -value = 0.011). From the calculation of the Odds Ratio, the value OR=1.999 was obtained, indicating that IMD is a risk factor for stunting. IMD is the process of placing the newborn baby on the mother's chest or abdomen so that the baby can naturally seek out the source of breast milk (ASI) and nurse. This is highly beneficial as the infant receives colostrum, which is present in the mother's first drops of breast milk and is rich in immune-boosting substances. Not only is it beneficial for the infant, but IMD is also highly beneficial for the mother as it helps accelerate the postpartum recovery process (Rahayu et al., 2018).

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers Receiving Exclusive Breastfeeding**

Based on the results of the bivariate analysis between the variable of exclusive breastfeeding and the nutritional status of stunted toddlers, the Pearson Chi-Square test yielded a result of 0.119 with a degree of freedom (df) = 2 and a significance value of 0.942. This value is much greater than the statistical significance threshold ( $\alpha = 0.05$ ), so it can be concluded that there is no statistically significant relationship between exclusive breastfeeding and the nutritional status of stunted children in the studied population.

These results are also supported by the Likelihood Ratio test, which shows a value of 0.118 with the same significance of 0.942, as well as the Linear-by-Linear Association result of 0.111 with a significance of 0.739, which again indicates no significant association between the two variables. Therefore, the null hypothesis ( $H_0$ ) stating that there is no relationship between exclusive breastfeeding and children's nutritional status cannot be rejected, or in other words, there is no statistical evidence

showing a relationship between the two variables. These findings indicate that in this study, exclusive breastfeeding is not directly related to the nutritional status of toddlers as measured by stunting.

This study is in line with the research conducted by (Nuraeni et al., 2024) "Risk Factors for Stunting in Children Aged 24-59 Months." The results of the study conducted on 44 respondents showed that exclusive breastfeeding is not a risk factor for stunting in children aged 24-59 months. This can be proven from the results of statistical tests using the Chi-Square test with a p-value of 0.217 ( $>0.05$ ) and an OR value of 0.473, meaning that infants not given exclusive breastfeeding are 0.473 times more at risk compared to those given exclusive breastfeeding. However, these findings contradict those of a study by Supriyatun et al. (2024) on 95 stunted children. Bivariate analysis using the Chi-square statistical test yielded a p-value of 0.001, indicating a relationship between exclusive breastfeeding and stunting.

The mandate of the law stipulated in Government Regulation No. 13 of 2013 concerning breastfeeding states that every mother who gives birth must provide exclusive breastfeeding to ensure the fulfillment of the baby's right to receive exclusive breastfeeding from birth until the age of 6 months (Muchlis et al., 2022).

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers with Acute Respiratory Infections (ARI)**

Based on the results of the bivariate analysis between the variable of history of acute respiratory infection (ARI) and the nutritional status of stunted toddlers, a Pearson Chi-Square value of 0.905 was obtained with a degree of freedom (df) = 2 and a significance value of 0.636. This value is significantly higher than the standard significance level ( $\alpha = 0.05$ ), indicating that there is no statistically significant association between the history of ARI and the nutritional status of stunted children.

These results are reinforced by a Likelihood Ratio of 1.287 ( $p = 0.525$ ) and a Linear-by-Linear Association of 0.094 ( $p = 0.759$ ), which also indicate insignificant results. Thus, the null hypothesis ( $H_0$ ) cannot be rejected, meaning there is insufficient evidence to conclude that there is a relationship between the incidence of ISPA and children's nutritional status in this study.

The results of this study are in line with the research (Aini et al., 2022) "The Relationship Between Low Economic Status and the Risk of Stunting: A Systematic Review." Out of 4,433 identified publications, the authors excluded several that did not meet the inclusion criteria, ultimately selecting 6 articles for further review. The study concluded that there was no significant association between a history of diarrhea and respiratory infections (ISPA) and the occurrence of stunting in children aged 3–5 years. In contrast, the study by (Maro et al., 2023) titled "The Relationship Between a History of Respiratory Tract Infections and the Occurrence of Stunting in Infants" found that 92% of cases fell into the short category and 8% into the very short category, with a chi-square test yielding a p-value of 0.000. Thus, there is a relationship between respiratory tract infections and height.

Environmental sanitation practices influence the incidence of stunting by increasing susceptibility to respiratory tract infections (Rahayu et al., 2018). Respiratory tract infections are one of the direct causes of stunting in toddlers (Nurdiansyah et al., 2024).

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers with Maternal Education**

The results of the analysis show that there is no significant relationship between maternal education and the nutritional status of toddlers. This is evidenced by the results of the Pearson Chi-Square test, which produced a significance value (p-value) of 0.723, greater than 0.05. This means that, statistically, maternal education has no proven effect on the nutritional status of children in this study.

This study is in line with research conducted by (Willyanto & Ramadhani, 2023) "The Relationship Between Maternal Education and Stunting in Five-Year-Old Children; A Systematic Review." In this study, only five articles stated that there was such a relationship, while one article stated that there was no relationship at all. This indicates that a mother's level of knowledge cannot be determined solely by her educational attainment. This is because they can acquire knowledge about nutrition from TV programs or other informal media.

In contrast to the study by (Husnaniyah et al., 2020) "The Relationship Between Maternal Education Level and Stunting Incidence," the study found that among 134 respondents with elementary school

education, a chi-square analysis yielded a p-value of 0.005 ( $p < 0.05$ ). This indicates a significant association between maternal education and stunting incidence in the service area of the Kandanghaur Indramayu Health Center.

According to (Rahayu et al., 2018), low maternal education is the highest risk factor for stunting compared to other risk factors. This is because mothers with higher education tend to have better financial conditions and can increase family income. Improving maternal behavior and education is key to addressing stunting. Increased maternal education is consistently associated with a reduction in stunting. Thus, one of the factors contributing to stunting in infants in rural and urban areas is maternal education (Sari et al., 2025).

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers with Family Income**

Based on the results of the Chi-Square test between family income and the nutritional status of stunted toddlers, a Pearson Chi-Square value of 1.250 was obtained with a significance value of  $p = 0.535$ . This value is much greater than the significance threshold of 0.05, which means that there is no statistically significant relationship between family income and the nutritional status of stunted toddlers in this study. The Likelihood Ratio test also yielded the same result, with  $p = 0.364$ , and the Linear-by-Linear Association test produced  $p = 0.583$ , all of which are greater than 0.05. Therefore, it can be concluded that in this study, family income level was not found to statistically influence the nutritional status of stunted infants.

This study is in line with the research (Willyanto & Ramadhani, 2023) "The Relationship Between Maternal Education and Stunting in Children Aged Five Years; Systematic Review," which states that based on the eigenvalue of the variables under study, the most dominant factor influencing stunting in children aged 6–23 months is parental income, with a value of 0.968. This value is greater than the significance level of 0.05, so it can be concluded that there is no statistically significant relationship between parental income and the incidence of stunting.

### **Analysis of Factors Related to Nutritional Status in Stunted Toddlers with Clean and Healthy Living Behaviors (CHLB)**

Based on the results of the above study, the Asymp. Sig. (2-sided) value of the Pearson Chi-Square test is 0.572, which is greater than the significance level of 0.05. This indicates that there is no significant relationship between family CHLB and the nutritional status of toddlers experiencing stunting. Additionally, the results of the Linear-by-Linear Association test show a significance value of 0.872, which is also greater than 0.05. This indicates that there is no linear trend between the level of CHLB and the nutritional status of children.

These findings are inconsistent with several previous studies that stated that CHLB has a significant relationship with stunting, because poor CHLB can increase the risk of infectious diseases that contribute to impaired child growth. However, these differences in results may be due to differences in regional context, measurement methods, or respondent characteristics. One study by (Zakiah et al., 2024) "Improving Clean and Healthy Living Behaviors (CHLB) as an Intervention to Prevent Stunting Incidence" with a study result of a T-value of -5.835 and a p-value of 0.000 ( $p < 0.05$ ), leading to the rejection of the null hypothesis ( $H_0$ ) and acceptance of the alternative hypothesis ( $H_a$ ), indicating that there is an influence between improved CHLB knowledge as an intervention to prevent stunting.

## **CONCLUSION**

Based on the results of the study "Analysis of Factors Related to Nutritional Status in Stunted Toddlers in the Working Area of the Oekabiti Community Health Center UPTD in 2025," it can be concluded based on the results of univariate and bivariate analyses of 30 respondents as follows:

This study shows that the majority of toddlers are male (56.7%), while females account for 43.3%. All respondents have  $\geq 3$  family members (100%). Based on age, the majority of infants were in the 36–47 month age group (63.3%), followed by the 48–59 month age group (36.7%).

Analysis of the relationship between low birth weight (LBW)  $p = 0.014$  shows a statistically significant relationship

Analysis of the relationship between Early Breastfeeding Initiation (EBI), Exclusive Breastfeeding, Acute Respiratory Infection (ARI) incidence, Mother's Education Level, Family Income, and the implementation of Clean and Healthy Living Behaviors (CHLB) with the nutritional status of stunted infants in this study showed no significant relationship, indicating that the provision of EBF to the study participants did not directly influence the nutritional status of stunted infants.

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#### CONFLICTS OF INTEREST

No conflicts of interest were disclosed by the writers of this work

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