

Original Research Article

Energy intake, household food security and stunting in toddlers at the health center of Molibagu, South Bolaang Mongondow Regency

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ABSTRACT

Background: Stunting is a chronic growth problem characterized by an increase in length or height that is not age-appropriate. Key factors contributing to stunting include energy intake and household food security. This study aimed to explore the relationship between energy intake, household food security and stunting in toddlers.

Methods: This study is a type of quantitative research with an analytical survey method using a cross sectional design conducted in the work area of the Molibagu Health Center, South Bolaang Mongondow Regency. The sample taken was 121 respondents using accidental sampling technique and met the inclusion and exclusion criteria.

Results: The percentage of stunted toddlers was 19.8%, not stunted was 80.2%. The proportion of household food expenditure in the low category was 52.9% and the high category was 47.1%. Energy intake in the deficient category was 38.8% and the sufficient category was 61.2% of toddlers, while protein intake in the deficient category was 20.7% and the sufficient category was 79.3% of toddlers. Analysis related to food security categories showed that families with food security categories amounted to 33.9%, food vulnerable 28.1%, food insufficient 18.2% and food insecure 19.8%.

Conclusions: There is a relationship between energy intake and stunting ($p=0.008$) and there is a relationship between the category of household food security and stunting ($p=0.022$) in toddlers at the Molibagu Health Center, South Bolaang Mongondow Regency. There is a need to optimize stunting prevention programs and cross-sectoral handling to overcome stunting and wasting in toddlers.

Keywords: Stunting, Energy intake, Food security

INTRODUCTION

Forms of malnutrition in toddlers include stunting. Stunting is a developmental disorder experienced by children due to poor nutrition, repeated infections, and inadequate psychosocial stimulation. Toddlers are defined as stunting if their height for age is below minus 2 standards based on the growth standards of the World Health Organization.¹

Basic Health Research in 2018 showed the national prevalence of stunting was 30.8%. This figure decreased compared to the prevalence of stunting in 2017 of 37.2% consisting of 18.0% of short toddlers and 19.2% of very short children.² The prevalence of stunting in Indonesia is ranked as the fifth largest stunting prevalence rate in the world.³ The proportion of stunting according to the basic health research report of North Sulawesi province is 25.46%. In Bolaang Regency of East Mongondow, the proportion of stunting under five is higher than the

proportion of stunting in North Sulawesi Province, which is 26.28%.⁴ Stunting that occurs in 1,000 HPK, besides it risks for physical growth barriers and children's susceptibility to disease, also causes cognitive developmental barriers that will affect children's intelligence and productivity levels in the future.⁵ Stunting are associated with increased mortality, especially if they occur in the same child.⁶

Susilowati and Ginting stated several factors that influence stunting, namely energy intake, birth weight, mother's education level, family income level, parenting patterns and food diversity.⁷ Fitriyani and Sunarto in their research more specifically stated that toddlers who lack energy have a 2.4 times risk of stunting compared to toddlers who have enough energy.⁸

One of the indirect causes of stunting is household food insecurity. In a study conducted by Belayneh, stunted toddlers were found in households with very low levels of food insecurity.⁹ The purpose of this study was to determine the relationship between energy intake, household food security and stunting in toddlers.

METHODS

This study is a type of quantitative research with an analytical survey method using a cross-sectional design conducted in the work area of the Molibagu Health Center, South Bolaang Mongondow Regency. This research was conducted in August to October 2023. The sample in this study was 121 respondents obtained from calculations using sample formulas and meeting the inclusion and exclusion criteria. The inclusion criteria in this study are that mothers of toddlers are willing to become respondents. The exclusion criteria for this study are toddlers with physical disabilities that affect measurement and toddlers who are sick. Respondents were taken using accidental sampling technique.

Data collection was carried out by visiting posyandu activities in the villages of the Molibagu Health Center working area. Before conducting interviews with respondents, researchers accompanied by nutrition officers explained the purpose and objectives of the study then in writing asked for the respondent's willingness to participate in this study by signing a sheet of willingness to participate in research (informed consent). Respondents who were willing then continued with interviews using questionnaires and measurements of body weight and body length of toddlers.

Univariate analysis was conducted to see the characteristics of research respondents such as age, gender, parental education, proportion of food expenditure, energy intake and protein intake, household food security category and stunting status of toddlers. Bivariate analysis was used to see the relationship between variables using the Chi square statistical test.

RESULTS

Overview of stunting

The subjects of this study were toddlers aged 12-47 months. Most research subjects were in the 12-23-month age category. There were 24 (19.8%) stunted toddlers, 97 (80.2%) non-stunted toddlers. Toddlers who are stunted are generally evenly distributed in almost all age categories. The most stunting was in the 12-23-month age category, namely 11 (9.09%). The most stunted toddlers have female gender, namely 13 (10.74%) while toddlers with male gender are 11 (9.09%).

Energy intake of toddlers in the moderate category was 74 (61.2%) while in the deficient category was 47 (38.8%) toddlers. Protein intake in the adequate category was 96 (79.3%) while toddlers who had less protein intake were 25 (20.7%). The proportion of food expenditure in the high category was 57 (47.1%) respondents in the low category as many as 64 (52.9%) respondents. The proportion of food expenditure is the ratio of food expenditure to total household expenditure. Most respondents' food security was in the category of food security 41 (33.9%) respondents. Respondents in the food insecure category were 22 (18.2%). Food security is seen from two indicators, namely the proportion of food expenditure and the level of energy adequacy (Figure 1).

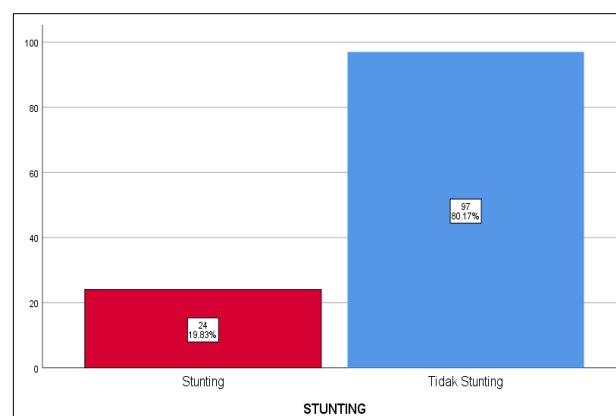


Figure 1: The percentage of toddlers' stunting status.

The relationship between energy intake and stunting

Toddlers with less energy intake experienced stunting as many as 15 (31.9%) toddlers, while toddlers with sufficient energy intake and did not experience stunting as many as 65 (80.2%) toddlers. The statistical test results show a value of $p=0.008$, which means that there is a relationship between energy intake and stunting in toddlers (Table 1).

The relationship between household food security and stunting

Households with food security categories at risk have stunted toddlers as many as 14 (30.4%) toddlers, while the

number of families who have food security categories that are not at risk and toddlers do not experience stunting is 65 (86.7%) toddlers. The statistical test results show a value

of $p=0.022$ which means that there is a relationship between the category of food security and stunting in toddlers (Table 2).

Table 1: Distribution of stunting status based on energy intake.

Variables	Stunting		Not stunting		Total		P value
	N	%	N	%	N	%	
Not sufficient ($\leq 80\%$)	15	31.9	32	68.1	47	100	0.008
Sufficient ($>80\%$)	9	19.8	65	80.2	74	100	

Table 2: Distribution of stunting status based on household food security.

Variables	Stunting		Not stunting		Total		P value
	N	%	N	%	N	%	
At risk	14	30.4	32	69.6	46	100	0.022
Not at risk	10	13.3	65	86.7	75	100	

DISCUSSION

Stunting is the impact of several risk factors, including low family-level food security, poor sanitation hygiene, insufficient food intake, and several social determinants. The impact of stunting, among others, can cause low cognitive abilities and increase several risks of degenerative diseases. This study analyzes the factors associated with stunting, both direct causal factors, namely energy intake and indirect causal factors, namely food security in toddlers.¹⁰

This study concluded that there was a relationship between energy intake and stunting in toddlers in the Molibagu Health Center working area ($p=0.008$). In line with this study, Putri and Bachtiar stated that there was a significant relationship between energy intake and the incidence of stunting with a value of $p=0.010$.¹¹ Aisyah and Yudianto also stated the results of research which stated that energy intake and protein intake were factors associated with the incidence of stunting in toddlers in Karanganyar village, Kawalu district, Tasikmalaya city.¹² Utami also stated that there was a relationship between energy and protein intake with stunting in Grogol Ponorogo village.¹³

Research showing the same results was also conducted by Nova and Afriyanti which stated that energy intake has a significant relationship with the incidence of stunting in toddlers.¹⁴ Non-stunting toddlers have a high intake of energy, protein, Fe, zinc compared to stunting toddlers.¹⁵ Meanwhile, Daud and Sinarsih stated that low energy intake is a risk factor for stunting in toddlers in the working area of the Teladan Health Center, Medan city.¹⁶

The statistical test results show that there is a significant relationship between food security and stunting ($p=0.022$) in toddlers in the work area of the Molibagu Health Center, South Bolaang Mongondow Regency. This study is in line with research conducted by Saraswati et al stating that there is a relationship between food security and stunting in toddlers.¹⁷ Sihite et al at Puskesmas II Ilir Palembang

city which states that food security is directly related to the incidence of stunting.¹⁸ Putri and Rokhaidah state that there is a relationship between food security and the incidence of stunting in toddlers during the COVID-19 pandemic.¹⁹

The same results were also presented by Hasan in his research that food security is a risk factor that has a significant effect on the incidence of stunting in toddlers in the coastal area of Central Buton Regency.²⁰ Safitri and Nindya stated that there is a significant relationship between family food security and stunting in toddlers.²¹

Nurjanah et al stated that household food security in Gunung Sari District, West Lombok Regency is still categorized as somewhat food insecure due to limitations in the availability, stability, accessibility and affordability, quality and safety of food so that it requires strategies to overcome so as to reduce stunting in the area.²² More specifically Febriyanti et al state that food-insecure households are significantly positively associated with the incidence of stunting.²³ Nurahadiyatika et al concluded that limited purchasing power in low socio-economic conditions leads to limited access to food, which has an impact on household food security.²⁴

Limitations

The limitation of this study is that the coverage of toddlers taken does not represent all villages in the large Molibagu Health Center working area. Respondents taken were toddlers living in 4 villages out of a total of 17 villages. The village taken is a village with a high number of stunted toddlers in the working area of the Molibagu Health Center.

CONCLUSION

The results showed that the percentage of toddlers who were not stunted was more than those who were stunted. The results of statistical tests show that there is a

relationship between energy intake, household food security and stunting in toddlers at the Molibagu Health Center, South Bolaang Mongondow Regency. There is a need to optimize stunting prevention programs and cross-sectoral handling to overcome stunting in toddlers.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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