

Household food insecurity and nutritional status of toddler in Central Lombok

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ABSTRACT

Background: Food insecurity can cause nutritional problems, especially in toddlerhood, where at this time nutritious intake is needed because at this time children experience growth that can have an impact on their adulthood. Food insecurity can stem from income poverty which negatively impacts overall household consumption levels. Therefore, the condition of food insecurity causes malnutrition, so the purpose of this study is to assess household food insecurity and nutritional status of toddlers in central Lombok, West Nusa Tenggara.

Methods: The design of this research was a cross-sectional study; data collection was carried out in Central Lombok Regency, West Nusa Tenggara Province, Indonesia. This research involved two groups of subjects: toddlers and father or mother caregiver. The total number of subjects was 391 toddlers include the household. Subjects were taken at each community health center using a simple random method without replacement. All primary data was collected through an interview process using a structured questionnaire and direct measurements. The analysis process for all types of data was carried out with the help of the SPSS for Windows program with the Pearson correlation test and One Way Anova test.

Results: This study presents that as many as 60.1% of households in Central Lombok experience food insecurity at mild, moderate and severe levels. Which can be caused by due to low monthly household income and social assistance.

Although the results of the analysis showed that no significant relationship was found ($p>0,05$) between the household food insecurity score and the anthropometric of the nutritional status of the toddlers almost half of the undernourished toddlers were included in the food-insecure households

Conclusions: High rate of food insecurity that occurs then, for increased access to food especially during period of rapid development and growth to overcome malnutrition (deficiencies and over nutrients) so that can prevent bad impact in the future.

KEYWORDS

Family economy, Food vulnerability, Nutritional status.

INTRODUCTION

Achieving food security is the right of all humans to meet basic needs. The food in question is certainly not just any food but must be safe, quality, nutritious and healthy. The goal of food security is to improve nutritional status so that people can live healthy and productive lives. Food security includes 4 aspects those are: availability, access, use of food and stable food¹. A person's nutritional security is formed from good food habits or eating patterns so that a good nutritional status is also formed². Food security can be seen from two things, namely food diversity and the frequency of eating and consumption behavior. The diversity of food consumption consists of several indicators: 1) food consumption score where calorie intake and food quality are measured at the household level, 2) household food diversity scale, 3) malnutrition 4) the amount of food costs for households³. Food insecurity can stem from income poverty which has a negative impact on overall household consumption levels. The food security framework is seen from the root causes of food insecurity and vulnerability, which is instead of trying to predict how well

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households will cope with food crises in the future. This concept can measure the ability of households to stay within the level of wellbeing such as food security in the face of stress and shocks⁴. Methods for measuring food security and nutrition exist both at the global level such as GFSI (Global Food Security Index), HANCI (Hunger And Undernutrition Index), as well as at the national level, which have been issued by the World Ministry of Agriculture and Food such as the FSVA (Food Security and Vulnerability Atlas of Indonesia) indicator is still fragmented by sub-systems and not all indicators can be applied in various regions. Therefore, a method of measuring food security and nutrition is needed in accordance with regional characteristics. Several indicators are strong predictors of food security at the household level, such as the proportion of food expenditure and the diversity of household diets. The proportion of food expenditure is quite sensitive to important aspects of food security such as food diversity and income levels⁵. In addition, the HDDS score or dietary diversity is the best proxy for assessing the condition of food security at the household level. These two indicators can be used as a standard reference in developing new instruments, such as composite indices. One of the age groups most at risk of malnutrition due to inadequate household situations is children under five years old. Then, referring to the UNICEF framework, food security at the household level is one of the indirect factors that cause health status through food nutrient intake. Based on the problems research's, this research aims to analyzing food security, mental health, and nutritional status of toddlers in migrant worker families in Central Lombok Regency, West Nusa Tenggara.

MATERIAL AND METHOD

Design, Location, and Time

The design of this research was a cross-sectional study; data collection was carried out in Central Lombok Regency, West Nusa Tenggara Province, Indonesia. The location selection was carried out purposively with the consideration that Central Lombok Regency was the district that has the highest prevalence of stunting nutritional problems by selecting seven health centers, including Teratak Batukliang Utara Health Center, Kopang Health Center, Pengadang Praya Tengah Health Center, East Mujur Praya Health Center, Batu Jangkih Health Center Praya Barat Daya, Kuta Pujut Community Health Center, Ubung Jonggat Community Health Center. Researchers chose these seven community health centers as research locations because of their representation in mountainous, lowland, and coastal areas, and they carried out their research purposively. The research was conducted for 3 months, from March to June 2024.

Population and Sample

This research involved toddlers and fathers or mothers who take care of toddlers. The inclusion criteria considered in deter-

mining the child as a subject are children aged 6 to 59 months, the condition of the child who is not seriously ill or undergoing routine treatment, and consent from the caregiver's father or mother as evidenced by signing an informed consent sheet. Meanwhile, the inclusion criteria considered in determining the father or mother who were take care of toddlers as a subject was overseas migrant workers. The number of samples based on the calculation formula is 391 households. The number of subjects was calculated using proportional allocation by considering the level/strata of food vulnerability of each health center. The number of subjects was 391, consisting of a caregiver father or mother and children. Subjects were taken at each community health center using a simple random method without substitution.

Data Types and Collection Methods

All primary data was collected through an interview process using a structured questionnaire and direct measurements. The child's nutritional status consists of 3 indices, namely Body weight for age, Height for body length, and Body weight for height. Nutritional status was measured by direct measurement of body weight using a digital step scale, while body

Table 1. Table of Assessment of Nutritional Status by Index WAZ, LAZ, WLZ

No	Indeks	Threshold (Z-Score)	Nutritional Status Category
1	Weight/age	< -3 SD	Severely underweight
		-3 SD sd < -2 SD	Underweight
		-2 SD sd +1 SD	Normal
		> +1 SD	Overweight
2	Length/age	<-3 SD	Severely stunted
		-3 SD sd < -2 SD	Stunted
		-2 SD sd +3 SD>	Normal
		+3 SD	Tall
3	Weight/lenght	< -3 SD	Severely wasted
		-3 SD sd < -2 SD	Wasted
		-2 SD sd +1 SD	Normal
		> +1 SD sd +2 SD	Risk of overweight
		> +2 SD sd +3 SD	Overweight
		> +3 SD	Obese

height used a length board. Then analyzed using WHO Anthro Survey Analyzer Software (Windows, Mac).

The characteristics of household size are grouped into 3 groups, those are small size (≤ 4 people), medium size ($\leq 5-6$ people) and large size (≤ 7 people). The Food Insecurity Experience Scale (FIES) is measured using the FIES Survey Module (FIES-SM) consisting of 8 questions on access to food and the measurement results are categorized into 3 categories, namely: Moderate Food Insecurity, Light Food Insecurity, Food security⁷. Household Dietary Diversity Score (HDDS) is measured using a structured interview with 1 x 24-hour recall and the measurement results are categorized into 2 categories, namely: Medium (4-5 Types of Food); High (> 6 Types of Food). Individual Dietary Diversity Score (IDDS) is measured using a structured interview with 1 x 24-hour recall and the measurement results are categorized into 2 categories, namely: Good (> 4 types/food groups); Less (< 4 types of food groups). In general, two levels of social organization were analyzed in this research: households and individuals/children. At the household level, the analyzed variables were all selected indicators of social, economic, and physical access. All these variables were combined into a composite index to measure the level of food security at the household level. At the household level, the variables collected were diet diversity and the proportion of household food expenditure.

Data processing

The analysis process for all data types was carried out with the help of the SPSS for the Windows program. This research also applies a composite index score validation test through the Spearman correlation test against two standard benchmark indicators: the HDDS score and the proportion of food expenditure. Another relationship test was to examine the re-

lationship between the index score and nutritional status, level of nutritional adequacy, and dietary diversity (IDDS) in children. The correlation test was applied using Spearman or Pearson, depending on the normality of the data. Another bivariate analysis in this research used the One-Way Anova difference test followed by the Tukey test to examine differences in index scores based on the regional food insecurity vulnerability level. This research has received approval from the Health Polytechnic of Mataram Ethical Commission with number: LB.01.03/6/115/2024.

RESULTS

The characteristics of the data from 391 households include 133 (34%) children under 2 years old, while 258 (66%) children were over 2 years old. Furthermore, the gender of toddlers is mostly male as many as 203 (51.9%) while female as many as 188 (48.1%). The distribution of household sizes from 391 households mostly has a small household size (≤ 4 people) as many as 304 (77.7%), medium household size ($\leq 5-6$ people) as much as 75 (19.2%) and large household size (≤ 7 people) as much as 12 (3.1%). The father or mother who cares for toddlers are all foreign migrant workers.

Table 2 view the cross table between the diversity of food consumption and the status of household food consumption that the more diverse the food consumed eats, the status of household food consumption is acceptable. The diversity of low food consumption has an impact on the poor status of food consumption by 4.3%.

The diversity of medium food consumption which has an impact on the poor status of food consumption and the border line is 10.6% and 0.8%. Furthermore, the high diversity of food consumption has an impact on the poor status of food consumption, the boundary line and can be accepted consec-

Table 2. Characteristics of toddler and household size

Variable	Category	Frequency	Percentage	P-Value
Age of toddler	6 -24 months	133	34	$< 0.001^*$
	25 – 59 months	258	66	
Gender of toddler	Male	203	51.9	0.212
	Female	188	48.1	
Household Size	Small (≤ 4 people)	304	77.7	$< 0.005^*$
	Medium ($\leq 5-6$ people)	75	19.2	
	Large (≤ 7 people)	12	3.1	
Father's occupation	Migrant	391	100	N.A

*Frequency (percentage) and means, standard deviation (SD) standard error means are reported, chi-square (χ^2) values are reported, and p-values are significant at $p < 0.05$.

Table 3. Household dietary diversity score (HDDS) and food consumption score (FCS)

Variable	Poor		Borderline		Acceptable		Total		P-value
	n	%	n	%	n	%	n	%	
Household Dietary Diversity Score (HDDS)									
Low	2	4.3	0	0	0	0	2	0.5	0.000
Medium	5	10.6	2	0.8	0	0	7	1.8	
High	40	85.1	225	99.2	87	100	328	97.7	
Total	47	100	257	100	87	100	391	100	

Table 4. Household dietary diversity score and household food insecurity access scale (HFIAS)

Variable	Food Secure		Mildly food insecure		Moderately food insecure		Severely food insecure		Total		P-value
	n	%	n	%	n	%	n	%	n	%	
Household Dietary Diversity Score (HDDS)											
Low	0	0	2	1	0	0	0	0	2	0.5	0.000
Medium	1	0.6	6	3	0	0	0	0	7	1.8	
High	155	99.4	194	96	32	100	1	100	382	97.7	
Total	156	100	202	100	32	100	1	100	391	100	

utively as many as 85.1%, 99.2% and 100%. Diversity of food consumption (HDDS) has a strong relationship with the status of household food consumption (FCS/HFIAS) as evidenced statistically ($p < 0.05$).

Table 5 show the nutritional status of anthropometric measurements is attached to table 3. To see the distribution of nutritional status of toddlers which consists of several indicators including weight by age, height by age and weight by height. On average, most toddlers have normal nutritional status on the weight indicator according to age of 68.5%, followed by very low weight of 11.3%, underweight of 17.2%, and overweight of 3%. Furthermore, in the height indicator by age, most also have a normal nutritional status of 58.6%, followed by a very short nutritional status of 18.7%, a short nutritional status of 21.2 and a high nutritional status of 3%. Then in the weight indicators according to height, most of them have a normal nutritional status of 82.3%, malnutrition as much as 3.4%, undernutrition as much as 8.4%, risk of overweight as much as 4.4% and over nutrition as much as 1.5%.

In table 6, in the indicator weight by age respectively as many as 7.7% and 13% of toddlers with very low weight and

low weight come from households that are food insecure, while respectively as many as 11.9% and 19.6% with very low weight and low weight come from households that are not food insecure. In addition, as many as 3.2% toddler with overweight came from food-insecure households and 3% with overweight too came from non-food insecure households. In the indicator height by age, respectively, 14.1% and 24.3% of toddlers with very short and short height came from food insecure households, while as many as 16.6% and 25.1% with very short and short height came from non-food insecure household. In addition, as many as 1.3% of toddlers with very high height come from food insecure households and 0.9% come from non-food insecure families.

The last, in the indicator weight by height as many as 2.6% and 7.1% respectively with very malnourished and malnourished nutritional status came from food insecure households, while as many as 3% and 10.2% with severe malnutrition and malnutrition came from non-food insecure households. In addition, 5.1%, 1.9% and 0.6% of those at risk of overweight, overweight and obesity came from food insecure households, while 3.8%, 1.3% and 0.4% came from non-food insecure household.

Table 5. Nutritional status of toddler

Anthropometrics	Gender						P-value
	Male		Female		Total		
	n	%	n	%	n	%	
Weight/age							
Severely underweight	23	11.3	17	9	40	10.2	0.319
Underweight	35	17.2	32	17	67	17.1	
Normal	139	68.5	133	70.7	272	69.6	
Overweight	6	3	6	3.3	12	3.1	
Average ± SD	-1.47 ± 1.29		-1.39 ± 1.45		-1.43 ± 1.37		
Height/age							
Severely stunted	38	18.7	23	12.3	61	15.6	0.064
Stunted	43	21.2	54	28.7	97	24.8	
Normal	119	58.6	110	58.5	229	58.6	
Tall	3	1.5	1	0.5	4	1	
Average ± SD	-1.91 ± 2.24		-1.71 ± 2.19		-1.82 ± 2.21		
Weight/height							
Severely wasted	7	3.4	4	2.1	11	2.8	0.162
Wasted	17	8.4	18	9.6	35	9	
Normal	167	82.3	153	81.4	320	81.8	
Risk of overweight	9	4.4	8	4.3	17	4.4	
Overweight	3	1.5	3	1.6	6	1.5	
Obese	0	0	2	1	2	0.5	
Average ± SD	-0.68 ± 1.18		-0.67 ± 1.35		-0.68 ± 1.26		

DISCUSSION

This study is one of the studies to look at the analysis of food insecurity and nutritional status of toddlers in central Lombok. Common characteristics that have been collected include age, gender, occupation, nutritional status, and household size. Nutritional status and household resilience were identified as factors to see food insecurity occurring. In this study, all heads of families of toddlers are migrant workers (100%). In previous research, it was found that there was no effect of migrant workers' income on food security, indeed migrant workers' income could help increase food security but

could not guarantee that the food consumed was a variety of food that was complete with nutrition⁸. The low food diversity is influenced by the low monthly income generated by households and the receipt of social assistance. Food insecurity increases the likelihood of malnutrition. This is because insufficient food is due to the lacing of household deposits, so increasing the risk of inadequate food. Previous research conducted in Rural Malawi also stated that the diversity of food consumption has a strong relationship with the income generated, because the higher the diversity of food consumption depends on the income generated⁹.

Table 6. Distribution of the nutritional status of toddler and household food insecurity

Variable	Food insecurity	Food security	Total	P-value
Weight/age				
Severely underweight	12 (7.7)	28 (11.9)	40 (10.2)	0.033
Underweight	21 (13.5)	46 (19.6)	67 (17.1)	
Normal	188 (75.6)	154 (65.5)	272 (69.6)	
Overweight	5 (3.2)	7 (3.0)	12 (3.1)	
Length/age				
Severely stunted	22 (14.1)	39 (16.6)	61 (15.6)	0.453
Stunted	38 (24.3)	59 (25.1)	97 (24.8)	
Normal	94 (60.3)	135 (57.4)	229 (58.6)	
Tall	2 (1.3)	2 (0.9)	4 (1.0)	
Weight/length				
Severely wasted	4 (2.6)	7 (3.0)	11 (2.8)	0.194
Wasted	11 (7.1)	24 (10.2)	35 (9.0)	
Normal	129 (82.7)	191 (81.3)	320 (81.9)	
Risk of overweight	8 (5.1)	9 (3.8)	17 (4.3)	
Overweight	3 (1.9)	3 (1.3)	6 (1.5)	
Obese	1 (0.6)	1 (0.4)	2 (1.0)	

Table 7. Correlations of the anthropometric of toddler with HFIAS score

Z-Score	Person's Correlation Coefficient	Level of significance (<i>p</i>)
BB/U	-0.092	0.069
PB/U or TB/U	-0.099	0.050
BB/PB or BB/TB	-0.034	0.501

Table 8. Correlations of the anthropometric of toddler with FCS score

Z-Score	Person's Correlation Coefficient	Level of significance (<i>p</i>)
BB/U	0.032	0.533
PB/U or TB/U	0.040	0.431
BB/PB or BB/TB	-0.056	0.268

Based on reports from the results of the study by HFIAS, most households have food insecurity, which is divided mildly, medium and severe food insecurity of 60.1%, due to the decline in household income and increasingly high food prices, not spared from the cost of other necessities such as medicines, school payments, house or vehicle installments.

The food insecurity rate that occurred at this research site was much higher than the food insecurity rate in Java and Sulawesi during the COVID-19 outbreak which was only 29.8%¹⁰. In an international report in Birjan, Iran, it was also found that food insecurity conditions amounted to 48%, but this figure is still smaller than the food insecurity that

occurs in Lombok¹¹. The results of this study are in line with the report on food insecurity data that occurred in Chile (49%) during the COVID-19 pandemic, this number has increased 2 times from before the pandemic (30%), but the rate of food insecurity that occurs in Central Lombok is still higher. The food insecurity that occurs is also influenced by age groups in households that have economic dependence such as children, adolescents and the elderly¹². Likewise, research that has been conducted by Orijakor et al. examines food insecurity, including food insecurity in Nigeria (32%) increasing during the COVID-19 pandemic and food insecurity that occurs has a strong relationship with household economic conditions¹³. Another similar study examining food insecurity in malnourished children in Botswana showed that 87.6% of households with children under five experienced food insecurity¹⁴.

Food insecurity affects food diversity. The results of this study show that the more severe the food insecurity experienced, the lower the diversity of food consumed. This research is like that conducted by Prasetyaningtyas et al. stating that there is a relationship between food availability and household food diversity, so it is necessary to increase food security for the creation of household food diversity¹⁵. In another study, it was reported that the low diversity of food consumption (4.63) was influenced by food insecurity¹⁶. Other results like this study reported that the diversity of food consumption in children was low (5.8) in 14 food groups. Children in households that experience food insecurity are three times more likely to have low diversity in food consumption¹⁷. Even though this research has limitation, this research makes a significant contribution to the limitation of existing data and provides important insights into the current state of food insecurity and its distribution based on nutritional status in cross sector population such as children under five years.

CONCLUSION AND RECOMMENDATIONS

This study presents that as many as 60.1% of households in Central Lombok experience food insecurity at mild, moderate and severe levels. Which can be caused by due to low monthly household income and social assistance. Although the results of the analysis showed that no significant relationship was found between the household food insecurity score and the anthropometric of the nutritional status of the toddlers in this study except for the height indicator by age using the HFIAS score, almost half of the undernourished toddlers were included in the food-insecure households. These results call for increased access to food, especially during period of rapid development and growth to overcome malnutrition (deficiencies and over nutrients). This can help improve nutritional status while reducing long-term impacts such as increasing the risk of degenerative diseases.

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REFERENCE

1. Trenchant JP et al. The Impact of Food Assistance on Food Insecure Populations During Conflict: Evidence from A Quasi Eksperiment in Mali, Word Development. Published online 2019:224-233. doi: 10.1016/j.worddev.2018.01.027
2. Simelane KS, Worth S. Food and Nutrition Security Theory. Food and Nutrition Bulletin. 2020;41(3):367-379. doi:10.1177/0379572120925341
3. Devi LY, Andari Y, Wihastuti L, Haribowo RK. Socio-Economic Model and Household's Food Security In In Indonesia. *J Ekon Pambang*. 2020;28(2)
4. FAO. 2013. Food Security and Nutrition in the Shouter and Eastern Rim of the Mediterranean Basin. Published online 2013. Food and Agriculture Organization
5. Ilham, N. & B. M. Sinaga. 2007. Penggunaan Pangsa Pengeluaran Pangan sebagai Indikator Komposit Ketahanan Pangan. *SOCA: Socioeconomics of Agriculture and Agribusiness*, 7(3).
6. Minister of Health of the Republic of Indonesia. Regulation of the minister of health of the republic of Indonesia number 2 of 2020 concerning child anthropometry standards. Jakarta: Minister of Health of the Republic of Indonesia, 2020. pp. 1-78
7. HA R. Measuring Food Insecurity Experience Scale (FIES) In Indonesia. *United Nations Stat Div*. Published online 2018:1-18.
8. Novriawati E, Nasrudin RA. Does Migrant Network Matter in Driving Internal Migration in Indonesia? *J Econ Dev Stud*. 2023;2(24):412-427. doi:10.18196/jesp. v24i2.19280.
9. Benefica RMS. Effects of Household Income Composition on Food Consumption in Rural Malawi. *Int Food policy Res Inst*. 2023; 23(8). doi.org/10.18697/ajfandl.123.23745
10. Sufyan DL, Syah MNH, Nurbaya. Prevalence and Factors Associated to Household Food Insecurity During Covid-19 Outbreak. *Ilmu Kesehat Masy*. Published online 2021:143-153. doi: https://doi.org/10.26553/jikm.2021.12.2.143-153
11. Moodi M, Mohtashamina S, Salehiniya H, Amininasab Z, Zonani MA. Prevalence of Household Food Insecurity in the Manginal

- Area of Bijand, Iran. Published online 2023. doi: <https://doi.org/10.3389/fsufs.2023.951698>
12. Giacomani C et al. Household Food Insecurity Before and During the COVID-19 Pandemic in Chile. *Public Health*. Published online 2021.
 13. Orjiakor EC et al. Household Living Condition and Food Insecurity in Nigeria: a Longitudinal Study During COVID-19 Pandemic. Published online 2023.
 14. Nnyepi MS et al. Association Between Household Food Insecurity (Access) Scores, Poverty Indicators and Child Malnutrition in Botswana. Published online 2023.
 15. Prasetyaningtyas D, Nindya TS. The Relationship Between Food Availability and Food Diversity in Farm Worker Households. *Media Gizi Indones*. 2017;12(2):149-155.
 16. Roy D. et al. Household Food Insecurity and Dietary Diversity of Women of Reproductive Age Among Smallholder Farming Households in Northwest Bangladesh. Published online 2022.
 17. Antwi J, Quaidoo E, Ohemeng A, Banneman B. Household Food Insecurity is Associated with Child's Dietary Diversity Score Among Primary School Children in Two Districts in Ghana. Published online 2022. doi:10.29219/fnr.v66.7715