KESANS: International Journal of Health and Science
e-ISSN: 2808-7178, p-ISSN: 2808-7380
Web: http://kesans.rifainstitute.com/index.php/kesans/index

Relationship Between Family Income and Food Insecurity Regarding Underweight Incidents in Children Under 5 Years Old, In 2024

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Article Information
Submitted: **15 November 2024**
Accepted: **20 November 2024**
Online Publish: **30 January 2025**

Abstract
Introduction: *Based on the Food and Nutrition Survey of Timor-Leste 2020, it was shown that most children under five years old in 13 municipalities are suffering from underweight issues at a rate of 32.4%. In Dili municipality, the prevalence of underweight is reported at 27.4%.* ***Objective:*** *This research is to understand the relationship between family income and food insecurity concerning underweight occurrences in children under five years old.* ***Method:*** *Research method utilized is a quantitative descriptive method with a cross- sectional approach. The population consists of mothers with children under five years old, totaling 274, with a sample size of 73 for the study.* ***Result and Discussion:*** *The univariate analysis shows that 56% of families have low income, and food insecurity is prevalent, with 26% experiencing severe insecurity. Based on food recall, 60% have poor food security, while the FFQ indicator shows 63% in poor condition. Underweight malnutrition affects 22% of children, with 55% experiencing poor nutrition. Family income significantly correlates with underweight cases (p=0.02), and food insecurity is also significant (p=0.01). The multivariate analysis shows an R-squared value of 20.2%.* ***Conclusion:*** *Research in Fomento II Village, Dili, in 2024 confirms a significant relationship between family income, food insecurity, and underweight cases in children under five*
Keyword: Family Income; Food Insecurity; Underweight;

How to Cite **Jessica dos Santos Amaral, Aniceto da Conceicao Pacheco, Tomas Elvis Fatima, Jerminal Magno, Marcos Carvalho, Levi Anatolia Soares Maia Exposto/Relationship Between Family Income and Food Insecurity Regarding Underweight Incidents in Children Under 5 Years Old, In 2024, Vol. 4, No. 4**
DOI https://doi.org/10.54543/kesans.v4i4.328
e-ISSN/p-ISSN **2808-7178 / 2808-7380**
Published by **Rifa'Isntitute**

Introduction

The nutritional status of children is a crucial aspect that parents must pay maximum attention to for the growth and development of children under five years old (Rahmi, 2019). This is based on the fact that underweight conditions in children under five are difficult to recover from, while nutritional problems can adversely affect their development and growth (Ramlah, 2021). Underweight is a form of malnutrition that occurs due to insufficient nutritional intake for physical health. When a child is at an ideal weight for their age, it indicates that they are consuming nutritious food that meets their nutrient needs. However, this differs for children who consume less nutritious food based on their physical needs (Uzogara, 2016), (Cuntz, Quadflieg, & Voderholzer, 2023)

Underweight is a nutritional issue that poses significant health problems, particularly when it does not receive adequate attention, potentially affecting the quality of human resources throughout life (Nainggolan & Sitompul, 2019). Being underweight can impact children's futures if timely interventions are not implemented, as this condition is not only a short-term concern but can also have long-lasting effects. The critical period for growth and development occurs in children aged 0-59 months, during which proper nutritional intake is essential. Insufficient nutrition during this extended timeframe can lead to malnutrition or underweight issues (Lette, Wungouw, & Woda, 2019)

Children under the age of five are considered a vulnerable group and are more susceptible to nutritional problems, necessitating special attention (Oktaviani, Nadhiroh, SM, & Tsaqifah, 2024). *Underweight* conditions in this age group can adversely affect growth and development, leading to cognitive impairments, disturbances in childhood intelligence, and reduced productivity later in life (Nasriyah & Ediyono, 2023). The causes of *Underweight* are multifaceted, stemming from both direct and indirect factors. Family income levels and food insecurity are significant contributors to the prevalence of *Underweight* among children (Chattopadhyay, Singh, & Gupte, 2023)

Family income significantly influences daily food consumption, especially when the family's income is at a minimum level, which affects their ability to purchase food based on its nutritional value rather than just its price (Friyayi, 2021). Income refers to the total funds that family members or the community receive over a period, serving as compensation for their contributions to production or participation in national output. Family income represents the actual earnings of all household members, which they utilize to meet their daily needs (Wuryanti, Listyaningsih, & Alansori, 2023). Family income can impact an individual's nutritional status, particularly for children under five years old. This is because family income is directly linked to the purchasing power for food necessities. When a family's income is at a minimum level, it may lead to changes in dietary habits or a reduction in the consumption of nutritious foods. Additionally, family income is associated with the frequency of food consumption for individuals each day (Hidayati, 2023)

Food insecurity occurs when a society lacks systematic and permanent access to food that is sufficient in quality and quantity for individuals to survive, as defined by *the Food and Agriculture Organization of the United Nations (FAO).* This means that those facing food insecurity experience uncertainty regarding the availability, types, and amounts of food they can consume, which can negatively impact their nutritional status and health. The *Food and Agriculture Organization of the United Nations (*FAO) also states that an individual is in a state of food insecurity when they do not have regular access to safe and nutritious food that is sufficient to support growth and development, leading to an active and healthy life.

According to the *Global Report on Food Crises 2022*, acute food insecurity continues to worsen globally. The report indicates that in 2021, a total of 193 countries reported populations suffering from food insecurity. This number increased by at least 38 million people compared to 2020 and represents the highest rate since 2016. Research on food and nutrition in Timor-Leste in 2020 showed that mild food insecurity affected 49.6% of the population, moderate food insecurity affected 34.8%, and severe food insecurity affected 15.6%.

Nutritional problems in Timor-Leste are significant, particularly concerning underweight issues among children under five years old, which negatively impact their growth and cognitive development. Prevalence data for underweight children in 2021 reported by the World Health Organization (WHO) indicated rates of 15.2% in Africa, 1.9% in America, 11.5% in the Eastern Mediterranean, 24.3% in Southeast Asia, and 2.1% in the Western Pacific. Research conducted in Timor-Leste in 2020 revealed that most children under five years old across 13 municipalities suffered from underweight issues at a rate of 32.4%. In Dili municipality specifically, the prevalence of underweight was reported at 27.4%, indicating a serious concern compared to national nutritional standards. Based on secondary data from 2024 collected directly from Comoro Health Center in Dom-Aleixo Administrative Post, Dili municipality, it was found that the total prevalence of underweight among children under five years old was significant at 1,423 cases.

Observations made by researchers in Fomentu II Village, Comoro Suku, Dom-Aleixo Administrative Post, Dili municipality highlighted a relationship between family income and food insecurity concerning underweight issues among children under five years old. The community reported having minimum family income levels while also facing food insecurity challenges, which motivated researchers to conduct further studies in the area

Method

The research method utilized is a descriptive quantitative method with a cross-sectional approach. Its objective is to analyze the "Relationship between family income and food insecurity concerning *underweight* occurrences in children under five years old in Fomento II Village, Comoro, Dom-Aleixo Administrative Post, Dili Municipality, in

2024". The research was conducted in Fomento II Village, Comoro, Dom-Aleixo Administrative Post, Dili Municipality, from June 25, 2024, to July 2, 2024. The population for this research included mothers with children under five years old, totaling 274 mothers with children under five and 292 children under five. Based on the formulation technique used, the sample size for this research was determined to be 73. The researcher employed random sampling as the sampling technique and utilized univariate and bivariate analysis methods, including chi-square tests. For multivariate analysis, the researcher used *SPSS software*.

Result and Discussion

Result

Univariate Analysis

Table 1

Distribution of Respondent Characteristics

AGE	**F**	**%**
19-28	30	41
29-38	31	43
39-48	12	16
PROFESSION		
Housewife	35	48
Employed	12	17
Helpers	6	8
Seller	20	27
LEVEL OF EDUCATION		
Absentee	4	5
Primary	12	16
Pre-Primary	10	14
Secondary	40	55
Degree	7	10
INCOME PER MONTH		
<135	41	56
>135	32	44
GENDER OF CHILD		
Female	44	60
Male	29	40
Total	**Total**	**Total**

Table 2

Univariate Analysis for variable X_1 (family income), X_2 (food insecurity), and Y (underweight)

Variable	F	%
X_1 (Income family)		
Good	32	44
Less	41	56
X_2 (Food Insecurity)		
Based on food availability and purchasing power indicators		
Good	16	22
Sufficient	38	52
Less	19	26
Based on the indicator's *food recall*		
Less	44	60
Sufficient	21	29
Good	8	11
Based on the FFQ		
Good	27	37
Less	46	63
Y *(underweight)*		
Malnutrition	16	22
Less Nutrition	40	55
Normal	17	23
Total	**73**	**100**

Bivariate Analysis

Table 3

Variable Relationship X_1 (Income Family) and X_2 (Food Insecurity) and variable Y (*underweight*)

Variable	***Underweight***								P-Value
	Malnutrition		**Less Nutrition**		**Normal**		**Less Nutrition**		
	N	%	N	%	N	%	N	%	
Income Family									
Good	4	5.5	25	34.2	3	4.1	32	43.8	0,02
Less	12	16.4	15	20.5	14	19.2	41	56.2	
Total	**16**	**21.9**	**40**	**54.8**	**17**	**23.3**	**73**	**100**	
Food insecurity based on food availability and purchasing power									
Good	2	2.7	12	16.4	2	2.7	16	21.9	0,01
Sufficient	4	5.5	20	27.4	14	19.2	38	52.1	
Less	10	13.7	8	11	1	1.4	19	26	
Total	**16**	**21.9**	**40**	**54.8**	**17**	**23.3**	**73**	**100**	
Food insecurity based on the *food recall*									
Less	6	8.2	23	31.5	15	20.5	44	60.3	0,04
Sufficient	5	6.8	15	20.5	1	1.4	21	28.8	
Good	5	6.8	2	2.7	1	1.4	8	11	
Total	**16**	**21.9**	**40**	**54.8**	**17**	**23.3**	**73**	**100**	
Food insecurity based on the FFQ									
Good	10	13.7	8	11	9	12.3	27	37	0,04
Less	6	8.2	32	43.8	8	11	46	63	
Total	**16**	**21.9**	**40**	**54.8**	**17**	**23.3**	**73**	**100**	

Multivariate Analysis

Table 4
Model Summary

Model	**R**	**R Square**
1	0.450[a]	**20.2**

Table 5
Anova

Model		**F Table**	**Significant Value**
1	Regression	4.310	.004[b]
	Total	**4.310**	**0.004**

Table 6
Coefficients

Model		**T table**	**Significant Value**
1	Income Family (X_1)	.700	.486
	Food Insecurity X_2	-2.312	.024
	Food Recall	-3.159	.002
	FFQ	-.094	.925

Discussion

Relationship between family income and underweight occurrences

The research results conducted in Fomento II sub-village, Comoro Village, Dom-Aleixo Administrative Post, Dili Municipality, in 2024 show that families with an income of less than 135 per month account for 41 individuals, representing 56%. In contrast, families with an income greater than 135 account for 32 individuals, representing 44%. Based on bivariate data analysis, it was found that families with higher income have 32 individuals (43.8%) associated with underweight occurrences in children under five years old, categorized as malnutrition at 4 individuals (5.5%), undernutrition at 25 individuals (34.2%), and normal nutrition at 3 individuals (4.1%). Families with lower income account for 41 individuals (56.2%) associated with malnutrition at 12 individuals (16.4%), undernutrition at 15 individuals (20.5%), and normal nutrition at 14 individuals (19.2%). Based on the chi-square test results between the family income variable and underweight occurrences, a p-value of 0.02 was obtained, which is less than 0.05. This indicates that there is a significant relationship between family income and underweight occurrences among children in Fomento II sub-village, Comoro village, Dom-Aleixo Administrative Post, Dili Municipality, in 2024. Based on previous research by Erma Kasumayanti and Zurrahmi Z.R., titled "*The Relationship Between Family Income and Underweight Incidences in Toddlers*," the results indicate a significant relationship between family income and underweight occurrences, with a p-value of 0.02. This suggests a significant correlation between family income and underweight incidences. Comparing these findings with previous results, both studies report a chi-square test statistic with a p-value of 0.02, indicating a significant relationship. Despite differences in location and timing between the previous research and the current study, both show

significant relationships through the chi-square tests.

According to Adiana and Karmini, family income represents the total real income of all family members contributing to collective and individual needs. From this research, the conclusion drawn is that there is a significant relationship between family income and *underweight* occurrences. When a family's monthly income is significantly low, it becomes challenging for them to access nutritious food in terms of both quality and quantity. Consequently, children under five years old who consume non- nutritious food may experience adverse health conditions, leading to unhealthy nutritional status among these children.

Relationship between food insecurity and underweight occurrences

The research results conducted in Fomentu II Sub-Village, Comoro Village, Dom-Aleixo Administrative Post, Dili Municipality, in 2024 indicate that food insecurity is present among 16 individuals, accounting for 21.9% of the population, with malnutrition affecting 2 individuals (2.7%), undernutrition affecting 12 individuals (16.2%), and normal nutrition affecting 2 individuals (2.7%). In cases of moderate food insecurity, there are 38 individuals (52.1%) with malnutrition affecting 4 individuals (5.5%), undernutrition affecting 20 individuals (27.4%), and normal nutrition affecting 14 individuals (19.2%). For mild food insecurity, there are 19 individuals (26%) with malnutrition affecting 10 individuals (13.7%), undernutrition affecting 8 individuals (11%), and normal nutrition affecting 1 individual (1.4%).

Based on the food recall indicator (*nutritional adequacy level*), children categorized as having inadequate nutrition total 44 individuals (60.3%), with malnutrition affecting 6 individuals (8.2%), undernutrition affecting 23 individuals (31.5%), and normal nutrition affecting 15 individuals (20.5%). In the category of adequate nutrition, there are 21 individuals (28.8%) with malnutrition affecting 5 individuals (6.8%), good nutrition at 15 individuals (20.5%), and normal nutrition at 1 individual (1.4%). Lastly, for the category of good nutrition, there are 8 individuals (11%) with malnutrition affecting 5 individuals (6.8%), undernutrition affecting 2 individuals (2.7%), and normal nutrition at 1 individual (1.4%). Based on the indicator of frequency of good food consumption in 27 with its percentage of 37%, malnutrition in 10 with its percentage of 13.7%, malnutrition in 8 with its percentage of 11% and normal in 9 with its number percentage 12.3%, the frequency of food consumption is low in 46 with its percentage number 63% see malnutrition in 6 with its percentage number 8.2%, malnutrition in 32 with its percentage number 43.8% and normal in 8 with its percentage number 11%.

Based on the results of the chi-square test between the variable of food insecurity and the occurrence of underweight obtained a p-value of $0.01<0.05$ for the indicator food recall obtained a p-value of $0.04<0.05$ and for the indicator FFQ obtained a value p-value $0.04<0.05$. Based on the results of this research, the researcher drew a significant conclusion between food insecurity and the occurrence of underweight. From the first

researcher named (Besti Verawati, Nopri Yanto, Nur Afrinis) with her topic (*Relationship of protein intake and food vulnerability with the incidence of underweight in toddlers*) from the research results showed that there is a significant relationship with its p-value 0.005 of this result showed that there is a significant relationship between protein nutrient intake and food insecurity with the occurrence of underweight for the child. Comparison based on the first result showed that looking at the statistics of the *chi- square* test with its *p-value* of 0.05 and the results of the researcher who has a p-value of 0.01 for the indicator food recall found p-value 0.04 and for the FFQ indicator obtained a p-value of 0.04 from the research results that have shown that there is a relationship significant/problem although the first researcher and the current researcher's place and time of research are different but looking at the results of the *chi-square* test there is indeed a significant relationship.

Food insecurity is a condition of insufficient food received by a region, community, or household, at any time, certain standards to respond to physical needs for growth and public health (Badan Ketahanan Pangan, 2013). *Food recall* is a questionnaire that gives a picture of the consumption of energy and other nutrients in the form of frequency and quantity of a person (Sirajuddin, 2015). FFQ is a questionnaire method that asks about food history and questions that are closed, meaning that they are asked based on the foods on the list (Sirajuddin, 2015).

From this research, the researcher concluded that there is a significant relationship between food insecurity and underweight that many communities are still facing food insecurity and lack systematic and permanent access to food with quality and quantity. which is enough to survive their lives. Children need access to nutritious food that is balanced in quality and quantity based on their nutrient needs but when a family does not have good access to nutritious food this can be as a problem that can threaten the condition of the nutritional status of children because it must be given importance to these problems to maintain the condition that healthy to have children.

The relationship of family income and food insecurity with the occurrence of underweight

The results of the research conducted by the researcher in Fomento II Sub-Village, Comoro Village, Dom-Aleixo Administrative Post, Dili Municipality, 2024 showed that the summary model table with its R value of 0.450 and the total R square value of 20.2% of this result means that there is a relationship of coefficients of variables X1 (family income), X2 (insecurity food) to the variable Y *underweight* with its total r square of 20.2% and the contribution of other variables that the researcher failed to conduct research with a total of 79.8%, Table Anova f table 4,310 with its significant value of 0.04 and Based on the results of this research, the researcher concluded that there is a significant relationship between family income and food insecurity with the occurrence of underweight means that from the research results that have shown that there is a significant relationship/problem and make a comparison between researcher Erma

Kasumayanti, Zurrahmi Z.R with her topic (*Relationship of family income with the occurrence of underweight in toddlers*) and Besti Verawati, Nopri Yanto, Nur Afrinis with his topic (*The relationship between protein intake and food vulnerability with the incidence of underweight in toddlers*) said by researchers the first two did not have a multivariate test. This is what makes the difference between the first researcher and the current researcher whose research results from multivariate data analysis showed that there is a significant relationship between family income and food insecurity and the occurrence of *underweight*. From this research, the researcher concluded that there is a significant relationship between family income and food insecurity and the occurrence of *underweight* that family income and food insecurity become a factor that can threaten or problem the condition children's health.

Conclusion

Based on the results of research conducted in Fomento II Sub-Village, Comoro Village, Dom-Aleixo Administrative Post, Dili Municipality, 2024 is as follows: There is a significant relationship between X1 (family income) and X2 (food insecurity) for the occurrence of *underweight* in children aged <5 below in Fomento II Sub-Village, Comoro Village, Administrative Post Dom-Aleixo, Dili Municipality, Year 2024.

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