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Article

Analysis of Factors Related to Stunting Incidence in the Service Area of Alak Health Center, Kupang City

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Abstract

Background: Stunting is a condition in a person who has a length or height that is lacking. The main factors that cause stunting are family knowledge of nutrition, sanitation and family support. **Objectives**: This study aims to determine the Relationship between Income, Exclusive Breastfeeding History and Nutritional Intake with Stunting Incidents in the Alak Health Center Work Area. **Methods**: The type of research used is an analytical survey with a cross-sectional study approach. The number of samples in this study were toddlers aged 1-3 years who were taken using a simple random sampling technique. Sampling used a lottery technique. Each variable studied was tested using the Chi-Square test to determine the relationship between the variables of Income, Exclusive Breastfeeding History in Nutritional Intake. To test the significance, the researcher used a p-value with a significance level of 5% and a confidence level of 95%. **Results**: Monthly food (pVal : 0.005) and non-food expenditure (pVal : 0.003), history of exclusive breastfeeding (pVal : 0.004) and nutritional intake (pVal : 0.003 – 0.005) are related to the incidence of stunting, while monthly income is not related to the incidence of stunting in the Alak Health Center work area. **Conclusions**: The amount spent on food and non-food needs per month along with factors of exclusive breastfeeding history and nutritional intake are related to the incidence of stunting. Other factors such as the amount of income per month are not related to the incidence of stunting in the Alak Health Center work area.

Keywords: *large income, exclusive breastfeeding, nutritional intake*

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1. Introduction

Stunting is a condition in a person who has a length or height that is lacking. Stunting is a physical growth disorder characterized by a decrease in growth rate and is the impact of nutritional imbalance. The main factors that cause stunting are family knowledge of nutrition, sanitation and family support. In addition to the main factors above, there are many other factors that cause stunting, including LBW, education level, exclusive breastfeeding for less than 6 months, and economic status [1,2].

World Health Organization (WHO) data shows that in 2022, 22.3% or around 148.1 million children under 5 years old experienced stunting, but this figure has decreased compared to the previous year. The prevalence of stunted toddlers collected by the World Health Organization (WHO), Based on the Asia Region, is the region with the highest prevalence in 2022 with a percentage of 52%, followed by Africa with a stunting prevalence reaching 43% [3] WHO and Unicef recommend 4 (four) best eating patterns for

children up to 2 years of age, namely Early Initiation of Breastfeeding (IMD) in the first 30-60 minutes after birth, providing Exclusive Breastfeeding until the baby is 6 months old, starting to provide complementary foods from the age of 6 months and continuing breastfeeding until the child is 2 years old [3].

Data from the Ministry of Health in 2022, the prevalence of stunting in Indonesia decreased from 24.4% in 2021 to 21.6% in 2022. (Ministry of Health of the Republic of Indonesia, 2022). Based on data from the NTT Provincial Health Office in 2022, the number of stunting cases in NTT in 2021 and 2022 decreased, where in 2021 81,354 (20.9%) toddlers experienced stunting, decreasing in 2022 to 77,338 (17.7%) toddlers experienced stunting. (East Nusa Tenggara Health Office, 2022).

Kupang City still faces serious challenges in terms of nutrition (Stunting). Based on data from the Kupang City Health Office in 2022, the total number of stunting sufferers in Kupang City in 2022 reached 5497 (21.5%). Meanwhile, Alak District is ranked fourth for the most stunting sufferers in Kupang City in 2022, reaching 682 people (Kupang City Health Office, 2022). Alak District is the westernmost district and has the largest area in Kupang City. In Alak District there are 3 Health Centers, namely Naioni Health Center, Alak Health Center and Manutapen Health Center. Alak Health Center is one of the Health Centers in Kupang City which is equipped with inpatient facilities. Geographically, it is located in the Nunbaun Sabu Village, Alak District, Kupang City. The working area of the Alak Health Center is 22.2 km2 and is located at an altitude of 0-250m above sea level. The Alak Health Center is one of the health centers located in the Alak sub-district with the highest stunting cases in the Alak sub-district in 2022. Triggering factors that cause toddlers to experience stunting include economic factors, education levels and understanding patterns of each parent. To solve the problem of stunting nutrition, it is necessary to involve many parties, both parents, families, medical personnel and the government need to work together in combating this problem (Alak Health Center, 2022).

The problem of stunting is generally associated with poor previous nutritional intake. Low intake of macronutrients of energy and protein, especially during growth, can inhibit the growth and development of toddlers and cause stunting (short). The incidence of stunting is indirectly influenced by socio-economic factors, such as education level, family income, and food availability [4,5]. Based on the description above, the researcher is interested in knowing "The Relationship between Income, History of Exclusive Breastfeeding and Nutritional Intake with the Incident of Editing in the Alak Health Center Work Area in 2023".

2. Materials and Methods

2.1 Study Design and Setting

The type of research used in the study is an analytical survey, namely a study that looks at how far the contribution of certain risk factors to the occurrence of a certain event (effect). The research design used is by using the Cross Sectional Study approach, namely a study to study the dynamics of the correlation between risk factors and effects by means of an approach, observation or data collection at the same time.

2.2 Population and Sampling

The location of the study was at Posyandu Tetesan Kasih 1 and Tetesan Kasih 4 in the working area of Alak Health Center, the study was conducted from March 22 to April 16. The population in this study was 70 toddlers who were included in the working area of Alak Health Center. The sample in this study was taken using a simple random sampling technique, namely the researcher took sample members from the population randomly without considering the strata in the population.

2.3 Data Collection

Data collection using a questionnaire distribution method. The dependent variable in this study is the incidence of stunting in toddlers while the independent variables are

the history of food and non-food expenditure, history of exclusive breastfeeding, and history of food consumption (macronutrient intake).

2.4 Variables and Operational Definitions

This study uses independent variables, namely: history of food and non-food expenditure, history of exclusive breastfeeding, and history of food consumption (macronutrient intake). While the dependent variable is the incidence of stunting.

2.5 Data Analysis

Data collection was conducted through in-depth interviews with mothers, conducting questionnaires, and taking documentation. In this writing, the author uses Bivariate analysis to see whether there is a relationship between variables. The statistical test used in this study is the Chi-square test to prove the research hypothesis. To test the significance, the researcher used a p-value with a significance level of 5% and a confidence level of 95%. So it can be obtained that if the p-value <0.05 then it shows a relationship between the dependent variable and the independent variable.

2.6 Ethical Considerations

The results of the study will be presented in the form of tables and descriptions. This study has received ethical eligibility from the Health Research Ethics Commission, Faculty of Public Health, Nusa Cendana University with the number: 2021475-KEPK Year 2023.

3. Results

3.1. Respondent Characteristics

Table 1. Shows that the number of toddlers in the age range of 24-36 months is greater than the number of toddlers in the age range of 24-36 months (72.9%). According to gender, it is known that the number of toddlers is more male than the number of toddlers of the female sex (67.1%). According to the level of education of the mother, there are more mothers who have a low level of education compared to mothers who have a high level of education (54.3%). According to the mother's occupation, there are more mothers who do not work compared to mothers who work (62.9%).

Table 1. Distribution of Respondent Characteristics Based on Toddler Age, Toddler Gender, Mother's Education Level and Mother's Occupation in the Alak Health Center Work Area in 2023

Toddler Characteristics	n	%
Toddler Age		
12-23 month	19	27.1
24-36 month	51	72.9
Gender		
Male	23	32.9
Female	47	67.1
Mother's Education Level		
Low	32	45.7
High	38	54.3
Mother's Job		
Doesn't work	44	62.9
Work	26	37.1

3.2. Factors Related to Stunting Incidence in the Service Area of Alak Health Center, Kupang City

Table 2 shows that respondents who had food expenditure last month less than the UMR of Kupang City mostly (79.4%) had children experiencing Stunting compared to families who had food expenditure above the UMR of Kupang City. The results of the analysis showed a significance value of p-value = 0.005, which means that the large factor of money allocated for food expenditure is related to the incidence of stunting in the Alak Health Center Work Area of Kupang City.

Table 2. Factors Related to the Incidence of Stunting in the Service Area of the Alak Health Center, Kupang City

Indicator	Stunting				Total		*P-Value*
	Stunting		Not Stunting				
	n	%	n	%	n	%	
Food Expenditure							
< UMR	27	79.4	7	20.6	34	100	0.005
≥ UMR	17	47.2	19	52.8	36	100	
Non-Food Expenditure							
< UMR	39	72.2	15	27.8	54	100	0.003
≥ UMR	5	31.3	11	68.8	16	100	
History of Exclusive Breastfeeding							
< 6 Month	27	79.4	7	20.6	34	100	0.004
≥ 6 Month	17	47.2	19	52.8	36	100	
Macronutrient Intake (Carbohydrates)							
Low	31	77.5	9	22.5	40	100	0.003
Enough	13	43.3	17	56.7	30	100	
Macronutrient Intake (Fat)							
Low	24	51.1	23	48.9	47	100	0.004
Enough	20	87.0	3	13.0	23	100	
Macronutrient Intake (Protein)							
Low	33	55.9	26	44.1	59	100	0.005
Enough	11	100	0	0.0	11	100	

In addition, it is known that most respondents who have a history of not providing Exclusive Breastfeeding to babies and micronutrient intake (carbohydrates, fats and proteins) are less than what is needed have children experiencing Stunting compared to other families. The results of the analysis show that all significance values are smaller than pValue 0.05, which means that these factors are related to the incidence of stunting in the Alak Health Center Work Area, Kupang City.

4. Discussion

Income level is the total amount of income from all family members, including all types of income received by the family in the form of money, proceeds from selling goods, loans and others. Family income will determine the family's purchasing power including food, thus affecting the quality and quantity of food available in the household and ultimately affecting nutrient intake [6,7]. The results of the study showed that families with toddlers with incomes below Rp. 2,250,419 were more with a total of 27 people (71.1%) experiencing stunting with statistical test results showing p-value = 0.122 more than 0.05 (P = 0.05), this shows that there is no significant relationship between income and the incidence of stunting. This means that income does not determine stunting in toddlers in the Alak Health Center work area. This is because the majority of families have low incomes but can be met well to meet daily needs.

The results of the study showed that families of toddlers with food expenditure below the UMR, Rp. 2,250,419 were more with a total of 27 people (79.4%) experiencing stunting with the results of statistical tests showing p-value = 0.005 equal to or less than 0.05 (P = 0.05), this shows that there is a significant relationship between food expenditure and the incidence of stunting. This means that food expenditure determines stunting in toddlers in the Alak Health Center work area. The largest expenditure for food needs is spent on buying rice.

The results of the study showed that families of toddlers with food expenditures below the minimum wage, Rp. 2,250,419, were more numerous with 39 people (79.4%)

experiencing stunting with the results of statistical tests showing a p-value = 0.003 or less than 0.05 (P = 0.05), this indicates that there is a significant relationship between non-food expenditures and the incidence of stunting. This means that food expenditure determines stunting in toddlers in the Alak Health Center work area. The largest non-food expenditures are for the purpose of paying for children's school fees.

Based on the results of the study, the researcher assumes that there are still many family members who do not utilize their yards to grow food that contains nutritional value for their children. On the other hand, there are several families who can utilize their yards and plantations to grow food that contains nutritional value, and several husbands of the child's mother often catch fish or fish in the sea for their own consumption so that the child's nutrition is met. Respondents who have poor nutrition are caused by mothers who cannot manage their finances properly and lack nutritional knowledge. The results of this study are in line with research conducted [8]showing that there is a relationship between income and nutritional status of toddlers. The results of the study are based on the chi square test where the sig value is <0.01 which means P <0.05.

Low family income levels will greatly impact the low purchasing power of the family. Low family income levels greatly impact the low average level of education, which in turn will have implications for low levels of knowledge and behavior (especially nutritional knowledge and behavior). Low nutritional knowledge can affect the availability of food in the family, which in turn affects the quantity and quality of food consumption. Low quality and quantity of food consumption are direct causes of malnutrition in toddlers [910]Family income increases, so the quality of side dishes will increase. Conversely, low income can cause low purchasing power, because high and low income in the family greatly affects the family's purchasing power for food which ultimately affects the nutritional status of a person, especially toddlers because at this time many nutrients are needed for their growth and development. However, it does not rule out the possibility that low-income families can consume foods that have good nutritional value.

There is a relationship between income and nutritional status. This is because income level is a factor that determines the quality and quantity of food consumed. The family's ability to buy food depends on the size of the family's income. In addition, income level can determine eating patterns. Another theory put forward by [10–13]is that the family's ability to meet the food needs of all family members in sufficient quantities, both in quantity and quality, is certainly related to food availability, food prices, and family purchasing power.

The results of the analysis showed that exclusive breastfeeding was related to the incidence of stunting where 27 people (79.4%) were in the category of not being exclusively breastfed and 17 toddlers (47.2%) were in the category of being exclusively breastfed with the results of bivariate analysis using the chi square test obtained a P-value = 0.005 or less than 0.05 (P = 0.05) this shows that there is a significant relationship between exclusive breastfeeding and the incidence of stunting in the Alak Health Center Work Area, Kupang City.

The results of this study are in line with [14,15]which states that exclusive breastfeeding is not related to the incidence of stunting in toddlers, providing breast milk in combination with other foods and the mother's breast milk not flowing smoothly are the reasons for mothers not to provide exclusive breastfeeding to their children.

However, this study is in line with the study conducted by [16,17]which shows that there is a relationship between exclusive breastfeeding and the incidence of stunting in toddlers. Exclusive breastfeeding has a very important role in preventing toddlers from experiencing stunting, breast milk given to children up to the age of 6 months in this case is not giving other additional food to the child. In this study, mothers who did not provide exclusive breastfeeding to their children caused the children to experience stunting, not providing exclusive breastfeeding to children was also caused by the lack of knowledge of mothers about exclusive breastfeeding.

This study differs from the theory of Unicef in the modification of [14], the direct factor that affects nutritional status is exclusive breastfeeding as an aspect that plays a role in determining the nutritional status of children. Providing exclusive breastfeeding to children during their growth period is needed for brain and cognitive growth in children, if children get exclusive breastfeeding, they have the potential to be superior in achievement and increase intelligence, breast milk as a single food to meet the growth needs of children up to the age of six months. Other foods that are given too early to children can actually increase infectious diseases in children which directly affect the nutritional status of children. However, the results of research in the field show that children who get exclusive breastfeeding also have the potential to experience stunting. Based on in-depth interviews with respondents, in mothers who do not provide exclusive breastfeeding because at the time of birth the production of breast milk has not come out and is not smooth so that the child is helped by being given formula milk, the role of the family is also a factor in fulfilling the provision of breast milk to children, it is not said to be exclusive breastfeeding because the respondent's parents provide other intakes besides breast milk such as honey and rice water. The lack of knowledge of respondents about exclusive breastfeeding also plays a role in this. In this case, there may be other factors that have a greater influence on the incidence of stunting than the exclusive breastfeeding factor. However, breast milk remains a food that cannot be replaced by nutrition, especially in the first 6 months of a child's life.

4.1. The Relationship between Nutritional Intake and Stunting Incidence in the Alak Health Center Work Area, Kupang City

Nutrient intake is one of the direct causes that can affect the nutritional status of toddlers. Nutrient intake can also be obtained from several nutrients, including macronutrients such as energy, carbohydrates, protein and fat. Macronutrients are nutrients that are needed in large quantities by the body and mostly play a role in providing energy. The level of macronutrient intake can affect the nutritional status of toddlers. Toddlers with sufficient energy and protein intake levels and meeting the body's needs will be directly proportional to good nutritional status [18,19]. Carbohydrates are the main source of brain energy needed for various metabolic processes in the brain. Carbohydrates for brain cell activity are needed in the form of glucose. Glycogen that is broken down from protein can also be used as energy for the brain, but the use of glucose. In addition to functioning as a source of energy, carbohydrates, especially complex carbohydrates, such as whole grains, vegetables and fruits can also increase the absorption of tryptophan [20,21].

The main function of carbohydrates is to provide energy for the body. Carbohydrates are the main source for people around the world, because they are abundant in nature and relatively cheap. One gram of carbohydrates produces 4 calories. Some carbohydrates in the body are in the bloodstream as glucose for energy purposes, some are stored as glycogen in the liver and muscle tissue and some are converted into fat to be stored as energy reserves in fat tissue. Someone who eats excessive amounts of carbohydrates will become fat. The central nervous system and brain depend on glucose for their energy needs [22].

Fat intake from food if lacking will have an impact on the lack of calorie or energy intake for the body's activity and metabolism processes. Low fat intake followed by reduced energy in the body will cause changes in body mass and tissue and impaired absorption of fat-soluble vitamins. Fat is a macronutrient that functions as the largest contributor of energy, protects internal organs, dissolves vitamins and regulates body temperature [22].

Protein is a macronutrient that has very important functions, including as a source of energy, building material, and regulating material. Growth can proceed normally if protein needs are met, because the increase in size and number of cells which is the main process in growth requires protein. In general, protein can be categorized into two, namely

animal protein and vegetable protein. Animal protein comes from animals such as milk, meat, and eggs, while vegetable protein comes from plants such as nuts and seeds. Food ingredients containing animal protein are usually more expensive, so people with less purchasing power rarely include this food ingredient in their daily menu. [5,10,23].

The results of the analysis show that toddlers with insufficient nutritional intake are more likely to experience stunting, whereas toddlers with sufficient nutritional intake are more likely not to experience stunting. This is known from the results of the 2x24 hour food recall interview, most toddlers with stunting experienced a lack of carbohydrate nutrient intake of 77.5% with the results of bivariate analysis using the chi square test obtained a P-value = 0.003 or less than 0.05 (P = 0.05), this shows that there is a significant relationship between carbohydrate intake and the incidence of stunting, lack of fat intake of 51.1% with the results of bivariate analysis using the chi square test obtained a P-value = 0.004 or less than 0.05 (P = 0.05), this shows that there is a significant relationship between fat intake and the incidence of stunting and lack of protein intake of 55.9% with the results of bivariate analysis using the chi square test obtained a P-value = 0.005 equal to or less than 0.05 (P = 0.05), this shows that there is a significant relationship between protein intake and the incidence of stunting, therefore there is a relationship between nutrient intake and the incidence of stunting in toddlers in the Alak Health Center work area Kupang City. Some of the causes of this lack of nutritional intake are because many mothers of toddlers pay less attention to the nutrients in the food, they prefer to give snacks or ready-to-eat food before feeding their children so that when they are fed with vegetables or side dishes, the toddler's appetite is gone because they are used to snacks or instant foods.

This study is in line with that conducted by [10,24]which showed that there is a significant relationship between carbohydrate intake and stunting in toddlers in the working area of the Kabere Health Center, Cendana District, Enrekang Regency. This study is also in line with the study [5,10]which states that there is a relationship between fat intake and the nutritional status of toddlers. The results of the study showed that the lower the fat consumption, the greater the risk of stunting.

5. Conclusions

The results obtained in the study at the Alak Health Center, Kupang City can be concluded that 1). Monthly Food Expenditure, Monthly Non-Food Expenditure, History of Exclusive Breastfeeding, and Nutritional Intake are related to the incidence of stunting at the Alak Health Center, Kupang City. dan 2). Monthly Income is not related to the incidence of stunting at the Alak Health Center, Kupang City.

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7. Conflicts of Interest

The authors declare no conflict of interest.

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