



## Consumption Analysis of Children with Lack Nutrition at the Patient Health Center

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### ABSTRACTS

The number of malnutrition toddlers still exceeds the minimum number set on a national scale in Indonesia. Malnutrition occurs because of the lack of diversity in food consumption and fulfillment of energy and macronutrients in the consumption. The purpose of this research was to determine the diversity of food consumption and the level of fulfillment of energy consumption in malnutrition toddlers. The method in this research is the descriptive-analytical method with a quantitative research approach. The sampling technique uses total sampling, which includes all members of the population as samples. Diversity of consumption and level of energy fulfillment were obtained by interview using food frequency questionnaire and food recall 2x24 hours. The results of the research based on the diversity of consumption showed that the types of food commonly consumed by toddlers were rice (staple food); eggs, chicken, and fish (animal side dishes); tofu and tempeh (vegetable side dishes); spinach and carrots (vegetables); and papaya and banana (fruits). Based on the results of research on the level of energy fulfillment, as many as 39 toddlers have a deficit in energy consumption, 13 toddlers have a protein consumption deficit, 32 toddlers have a fat deficit, and 25 toddlers have a carbohydrate deficit. Recommendations in this research are addressed to the hospital to conduct outreach activities regarding knowledge of the diversity of food consumption and nutrients in foodstuffs.

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## 1. INTRODUCTION

Toddlers are the most vulnerable group of people to nutritional problems. In order not to easily suffer from nutritional disorders such as malnutrition during the growth and development cycle, toddlers need large amounts of nutrients from other age groups (Nurtina, et al., 2017). It is estimated that 101 million children under 5 years of age are undernourished, this is a fundamental problem. Malnutrition is a condition where the consumption of nutritional needs is not fulfilled. So the body will break down food reserves in the fat layer under the skin and organ layers. The condition of malnutrition in toddlers is called malnutrition. Undernutrition occurs due to a lack of nutritional ingredients in the consumption of toddlers such as energy (carbohydrates and protein) and fat needed by the body (Alamsyah et al., 2017).

One of the causes of under-nutrition in children under five is related to the intake of macronutrients and energy which affects the body index according to age (W/U) for children under five. Energy is obtained through the consumption of macronutrients, namely carbohydrates, proteins, and fats. According to research conducted by Firman & Mahmudiono, (2018) that the results of the study show that there is a relationship between energy intake and fat so that it affects the nutritional status of toddlers based on body weight according to age (W/U). There is a relationship between the consumption of energy, protein, and fat intake with the nutritional status of children under five. If the level of adequacy of energy, protein, and fat consumption is lacking, the nutritional status of toddlers becomes undernourished. So, it is necessary to increase food sources of energy, high protein, and high fat as well as varied food ingredients to reduce the risk of malnutrition in toddlers (Diniyyah & Nindya, 2017).

There are cases of malnutrition at the Simpang Tiga Pekanbaru Inpatient Health Center, namely the Basic Technical Implementation Unit of the Community Health Center which is in charge of carrying out some operational technical tasks under the Pekanbaru City Health Office located in Marpoyan Damai District, there are 20 undernourished children under five in Maharatu Village, 16 undernourished children. in East Sidomulyo Village, and 6 undernourished toddlers in Perhentian Marpoyan Damai Village with a total of 42 undernourished toddlers who are passive and active consumption based on data at the Simpang Tiga Inpatient Health Center Pekanbaru in 2020.

This study aims to determine the diversity of consumption of foodstuffs and the level of fulfillment of energy consumption in under-five children with malnutrition at the Simpang Tiga Inpatient Health Center Pekanbaru.

## 2. METHODS

This study uses a quantitative research approach design with an analytical descriptive method. The population in this study are mothers who have children under five with poor nutritional status as many as 42 people. Sampling using total sampling (saturated sample), namely sampling by taking or including all members of the population as a sample. The data collected includes the respondent's name, age, mother's occupation, mother's education, family income, food consumption for toddlers.

## 3. RESULT AND DISCUSSION

Malnutrition cases were found at the Simpang Tiga Inpatient Health Center Pekanbaru consisting of 3 sub-districts, namely Maharatu Village, Sidomulyo Timur Village, and

Perhentian Marpoyan Village. The data is who every month conducts checks related to nutritional status with parents of toddlers and not data for undernourished toddlers who are being treated at the hospital. Sample characteristics are shown in **Table 1**.

The sample of this study is for mothers of toddlers, there are many in the age range of 31-40 years, which is 45%. For toddlers, there are many in the 12-36 month age range, which is 64%. Consumption of children under five includes the diversity of types of food ingredients and the level of energy fulfillment.

**Table 1.** Sample characteristics.

Mother's Age (Years)	n	%
23 - 30	17	41
31 - 40	19	45
41 - 50	5	14
Toddler Age (Months)	n	%
12 - 36	27	64
38 - 60	15	36

#### a) Food Frequency of Undernourished Toddlers

Food Frequency in this study consisted of staple foods, animal protein, vegetable protein, vegetables, fruit, oil, sugar, snacks, and drinks. The results of Food Frequency in undernourished toddlers are shown in **Table 2**.

Consumption of staple food for toddlers is the main food, namely white rice which is most often consumed by toddlers, for other staple foods such as potatoes, white bread, cassava, dry noodles, and corn are included in the never consumed category. Toddlers often eat rice, because toddler mothers still don't introduce other basic food ingredients that must be consumed so toddlers still don't like it and are not used to eating it. Consumption of staple foods in this study has been fulfilled, but there is still a lack of eating frequency, which is 2 times a day, causing toddlers to experience malnutrition. This is in line with the research of [Nurcahyo & Briawan \(2010\)](#), which states that it is still found that toddlers consume white rice with a frequency of 2 times a day less than half (37%).

**Table 2.** Food frequency of undernourished toddlers.

Number	Type	Food Ingredients	Consumption Frequency (%)		
			Often	Seldom	Never
1	Staple food	Rice	100	0	0
		Potato	26	48	26
		White Bread	17	29	55
		Cassava	0	24	76
		Dry Noodle	5	24	71
		Corn	0	31	69
		Cereals	0	2	98
2	Animal side dishes	Beef	0	17	83
		Chicken meat	36	55	10
		Chicken eggs	69	10	21
		Fresh fish	55	36	10
		Nuggets	0	14	86
		Shrimp	2	19	79

**Table 2 (Continue).** Food frequency of undernourished toddlers.

Number	Type	Food Ingredients	Consumption Frequency (%)		
			Often	Seldom	Never
3	Vegetable side dishes	Sausage	7	7	86
		Chicken's liver	5	0	95
		Quail eggs	0	5	95
		Red beans	0	5	95
		Tahu	62	26	12
		Tempe	60	26	14
		Peas	0	2	98
		Kembang Tahu	0	0	100
4	Vegetable	Mung beans	0	10	90
		Spinach	55	24	21
		Carrot	45	36	19
		Broccoli	0	19	81
		Young corn	0	10	90
		Kale	19	24	57
		Cauliflower	10	17	74
		Chayote	12	7	81
5	Fruits	Orange	26	40	33
		Red Apple	12	21	67
		Pawpaw	31	31	38
		Banana	45	29	26
		Watermelon	0	29	71
		Melon	0	7	93
		Mango	5	14	81
		Pear	0	2	98
		Snakefruit	2	7	90
		6	Milk and Processed Products	Milk	71
Yoghurt	5			7	88
Cheese	0			5	95
Ice Cream	38			36	26
7	Snacks	Bakso	2	31	67
		Chocolate	19	17	64
		Bread	10	19	71
8	Snack Drinks	Biscuits	31	36	33
		Aneka assorted fried snacks	10	0	90
		Light Snack/Chiki	43	10	48
		Juice	2	17	81
		Pop Ice	0	2	98
		Nutrisari	0	14	86
		TehGelas	2	7	90
		Sprite	0	0	100
Coca Cola	0	0	100		

Eggs are an animal side dish favored by toddlers, so eggs are a type of animal side dish that is often consumed. Besides being liked by toddlers, eggs are an animal side dish that has an affordable price and is often available at home. Beef, nuggets, sausages, and prawns are never consumed by toddlers because prices are less affordable based on the income of parents of toddlers. Toddlers never eat chicken liver and quail eggs because they smell fishy and toddlers don't like it. Based on the research of [Diniyyah & Nindya, \(2017\)](#), the level of family income is one of the socio-economic indicators that play a role in the provision of food. Low income can be one of the factors causing malnutrition status of children under five because if the amount of income is low, the level of food expenditure is also low so that it can cause low purchasing power and the availability of food provided by parents for toddlers which plays a role in consumption levels.

Vegetable side dishes that are usually consumed by toddlers are tofu and tempeh because these vegetable side dishes are easy to process into a simple menu that toddlers like so that they are consumed almost every day, and tofu and tempeh are easy to find and have affordable prices. The majority of toddlers who are malnourished in Balerejo District consume vegetable side dishes such as tempeh and tofu, because they are easy to find in the nearest market and have affordable prices and draw the results of daily consumption frequency but the portioned food consumed is not sufficient based on the recommended amount.

Spinach and carrots are the highest percentages in the "frequent" category in the average food consumption because toddlers like it and spinach are easy to eat and soft, unlike kale, which has a slightly thicker texture. Types of vegetables consumed are spinach and carrots. The application of vegetable consumption is influenced by what is available at home and the provision of vegetable consumption certainly has a reference or role model, such as parents being role models in providing vegetable consumption at home ([Umar & Muhammad, 2018](#)).

Consumption of papaya and banana is preferred and often consumed by toddlers. The fruits that are often consumed by toddlers who experience malnutrition in Balerejo District are mostly papaya and bananas, each with 52% because these fruits can be found in the nearest market and have high prices. affordable.

Based on the results of the study, although most toddlers never consume milk, almost half of them like to consume formula milk (powder) and a small number of toddlers only like to consume UHT milk (liquid). The most of what toddlers consume, namely formula milk (powder) and consumption of formula milk (powder), as well as liquid milk, shows the habits and preferences of toddlers in consuming milk types.

For snacks, less than half of toddlers like to eat light snacks and biscuits. This is in line with research by [Rohimah et al., \(2015\)](#) which states that light snacks are the type of snack food most often consumed by toddlers. Toddlers tend to refuse other foods when they have eaten light snacks because eating light snacks makes the toddler's stomach full quickly and mothers still give toddlers light snacks without paying attention to the nutritional content of the snacks. Toddlers tend to like street food rather than snack drinks. Snacking habits are very influential on the nutrition of toddlers. This is in line with the research of [Herman et al., \(2016\)](#), namely the presence of incomplete nutrients in snack foods cannot replace breakfast or lunch in toddlers. Consumption of nutrients such as carbohydrates, fats, proteins, vitamins, and minerals will be very less in toddlers who eat snacks because their stomachs are easy to fill with dense calories entering their bodies.

#### b) Carbohydrate Consumption in Undernourished Toddlers

Carbohydrate consumption of children under five in this study is shown in **Table 3**. The average carbohydrate consumption for toddlers aged 1-3 years is 109.37 grams and the

percentage level of carbohydrates consumed by toddlers is only (69.8%) so that the average level of carbohydrate consumption for toddlers is still in the less category. The average carbohydrate consumption for toddlers aged 4-5 years is 121.16 grams and the percentage level of carbohydrates consumed by toddlers is only (55.08%) which means the average level of consumption for toddlers is still in the deficit category. In this study, there was a lack of carbohydrate consumption as a source of energy in toddlers. Based on the research, it was found that the consumption of staple foods, namely rice, on average, toddlers consumed 150 grams of rice, but there were still most toddlers who only consumed 50-100 grams of rice. The more children consume around 150 grams of rice every day. However, there are still children who in their daily life do not eat rice regularly, only eating 50-100 grams of rice.

**Table 3.** Carbohydrate consumption.

Number	Description	Mean	
		1-3 Years Old	4-5 Years Old
1	Amount of carbohydrates consumed (grams)	109.37 ± 24.10	121.16 ± 25.31
2	Percentage level of carbohydrates consumed (%)	69.80 ± 15.70	55.08 ± 11.51

#### c) Protein Consumption in Undernourished Toddlers

Protein consumption of children under five in this study is shown in **Table 4**. The average protein consumption for toddlers aged 1-3 years is 15.64 grams and the percentage level of protein consumed by toddlers is only (78.22%) so that the average level of protein consumption for toddlers is still in the less category. The average protein consumption for toddlers aged 4-5 years is 18.37 grams. and the percentage level of protein consumed by toddlers is only (73.49%) which means the average level of consumption of toddlers is still in the less category. Sources of protein in food consumption commonly consumed by toddlers are chicken meat, chicken eggs, and fish as sources of animal protein and tofu and tempeh as sources of vegetable protein. In this study, there was a lack of protein consumption as an energy source in toddlers. Toddlers consume tempeh, tofu, and eggs every day but the amount consumed is still lacking, the average child consumes 17 grams of protein a day. Even though the recommended protein consumption in a day is 25 grams. Based on research conducted by [Lutviana & Budiono \(2010\)](#), the results of the relationship analysis found a relationship between the level of protein consumption and the nutritional status of children under five. Of the 21 toddlers who consumed less protein, 20 (95.2%) were undernourished.

**Table 4.** Protein consumption.

Number	Description	Mean	
		1-3 Years Old	4-5 Years Old
1	Amount of protein consumed (grams)	15.64 ± 3.24	18.37 ± 3.25
2	Percentage level of protein consumed (%)	78.22 ± 16.21	73.49 ± 13.01

#### d) Fat Consumption in Undernourished Toddlers

Fat consumption of children under five in this study is shown in **Table 5**. The average consumption of fat in toddlers for ages 1-3 years is 24.7 grams. the percentage level of fat consumed by toddlers is only (56.10%) so that the average level of fat consumption for toddlers is still in the deficit category. The average fat consumption for toddlers aged 4-5

years is 29.29 grams and the percentage level of fat consumed by toddlers is only (58.59%) which means the average level of consumption for toddlers is still in the deficit category. Sources of fat in food consumption are usually consumed by toddlers, namely chicken meat, chicken eggs, and fish as a source of animal protein and tofu and tempeh as a source of vegetable protein. Based on research found on fat consumption, there is still a lack of variety in the type of food consumed, such as the finding that the majority of toddlers never eat cheese and meat due to limited parental income, and the lack of servings of eggs as a source of fat. The existence of a low level of fat consumption due to the small number of servings of foods such as eggs, cheese, meat which are sources of fat consumption for undernourished children. The majority of toddlers in Balerejo Subdistrict who are malnourished often consume eggs but the number of eggs consumed is still lacking and there are still many children under five who never eat cheese and meat due to family socio-economic factors so that children's fat needs are still very low and classified in the deficit category.

**Table 5.** Fat consumption.

Number	Description	Mean	
		1-3 Years Old	4-5 Years Old
1	Amount of fat consumed (grams)	24.70 ± 6.88	29.29 ± 7.62
2	Percentage level of fat consumed (%)	56.10 ± 15.70	58.59 ± 15.25

#### e) Energy Consumption in Undernourished Toddlers

The energy consumption of children under five in this study is presented in **Table 6**. The average energy consumption for toddlers aged 1-3 years is 722.37 kcal, the percentage level of energy consumed by toddlers is only (53.51%) so that the average level of fat consumption for toddlers is still in the deficit category. The average energy consumption of toddlers for ages 4-5 years is 821.80 kcal. And the percentage level of energy consumed by toddlers is only (58.70%) which means the average level of consumption of toddlers is still in the deficit category. Based on the research conducted, the majority of children under five are malnourished because they are classified in the deficit category.

This is in line with the research of [Lutviana & Budiono, \(2010\)](#), that the majority of the energy consumption level of children under five is still less, which is more than half (70.4%) so that based on the research it was found that there is a relationship between the level of energy consumption and the status of undernourished children under five. According to [Andarwati in Susanti's research, \(2012\)](#), children who have poor nutritional status have a higher level of energy consumption. Energy consumption is a factor that is directly related to the nutritional status of children under five. This shows that there is a relationship between the level of energy consumption and the nutritional status of children under five. Based on research conducted by [Hariyani \(2016\)](#), states that toddlers who are included in the deficit category have problems in eating such as the amount of food consumed is still small.

**Table 6.** Energy consumption.

Number	Description	Mean	
		1-3 Years Old	4-5 Years Old
1	Amount of energy consumed (grams)	722.37 ± 141.87	821.80 ± 142.16
2	Percentage level of energy consumed (%)	53.51 ± 10.51	58.70 ± 10.15



## f) Percentage Level of Consumption of Undernourished Toddlers

Based on the research, **Table 7** shows the results of the percentage of toddler consumption data consisting of good, medium, less and deficit categories.

The level of consumption category for toddlers aged 1-3 years on the results of the calculation of food consumed by toddlers is calculated according to the recommended Nutritional Adequacy Rate (RDA) (see **Table 8**). For the percentage level of energy consumption entirely (100%) is included in the deficit category, for the percentage level of protein consumption less than half (34.37%) is in the moderate category, and a small portion (21.87%) is included in the less category, for the percentage level of protein consumption fat consumption is more than half (62.5%) is included in the deficit category and for a small part (18.75%) is included in the less category, for the percentage level of carbohydrate consumption less than half (37.5%) is included in the deficit category, for less than half of the category, namely (28.125%), a small percentage (18.75%) are included in the medium category.

**Table 7.** Percentage level of consumption category for toddlers age 1-3 years.

Percentage Level of Consumption Category Toddlers Age 1-3 years				
	Energy	Protein	Fat	Carbohydrate
	%	%	%	%
<b>Good</b>	0	9.375	0.000	0.000
<b>Fair</b>	0	34.375	3.125	18.750
<b>Poor</b>	0	18.750	18.750	28.125
<b>Deficit</b>	100	21.875	62.500	37.500

**Table 8.** Percentage level of consumption category of toddlers age 4-5 years.

Percentage Level of Consumption Category Toddlers Age 4-5 years				
	Energy	Protein	Fat	Carbohydrate
	%	%	%	%
<b>Good</b>	0.00	0.00	0.00	0.00
<b>Fair</b>	0.00	26.67	0.00	6.67
<b>Poor</b>	20.00	33.33	20.00	6.67
<b>Deficit</b>	80.00	40.00	80.00	86.67

The level of consumption category for toddlers aged 4-5 years on the results of the calculation of food consumed by toddlers is calculated according to the recommended Nutritional Adequacy Rate (RDA). For the percentage level of energy consumption, most (80%) are in the deficit category and a small portion (20%) are in the less category, for the percentage level of protein consumption less than half (40%) are in the deficit category and for the less category there are less than half (33.33%), for the percentage level of fat consumption most (80%) are included in the deficit category and a small portion (20%) are in the less category, for the percentage level of carbohydrate consumption some (86.67%) are included in the category deficit, for the less and moderate category there is a small portion that is 6.67%. Based on the results of the study that for energy consumption as many as 39 toddlers are in the deficit category and 3 toddlers are in the less category. For protein consumption, 13 toddlers are in the deficit category, 11 toddlers are in the less category, and 15 toddlers are in the moderate category. For fat consumption, 32 toddlers are in the deficit category, 9 toddlers are in the less category, and 1 toddler is in the moderate category. For



carbohydrate consumption, 25 toddlers are in the deficit category, 10 toddlers are in the less category, and 7 toddlers are in the moderate category.

This is in line with the research of [Firman & Mahmudiono, \(2018\)](#) that toddlers who have a deficit in the amount of consumption will be at risk of being undernourished. Toddlers need an increase in consumption of food sources of energy, high in protein, and fat as well as varied food sources to reduce the risk of malnutrition in toddlers ([Diniyah & Nindya, 2017](#)).

#### 4. CONCLUSION

Analysis of consumption in toddlers can be considered through the variety or type and amount consumed by toddlers. Food Frequency in this study is used as an indicator to determine the frequency of types of food consumed by toddlers. Based on research, it was found that consumption of staple foods, namely most children under five often consume rice, for consumption of animal side dishes more than half often consume chicken eggs and fish, for consumption of vegetable side dishes more than half often consume tofu and tempeh, for consumption of vegetables more than half of them eat spinach and half eat carrots, for fruit consumption, namely toddlers most like to eat papaya and bananas, for consumption of milk and its derivatives less than half often consume formula milk, UHT milk, and ice cream, for snack food consumption is less from half of them often consume biscuits and light snacks, for snacks most of them never consume juice and sweet drinks.

Food Recall as an indicator to determine the amount of nutrition consumed by toddlers based on the recommendations in the Nutrition Adequacy Rate (RDA). Carbohydrate consumption in toddlers aged 1-3 years has an average of (109.37 grams) and the contribution of carbohydrate consumption to energy is 437.48 kcal (32.40%) based on the recommended daily RDA. For toddlers aged 4-5 years have an average carbohydrate consumption of (121.17 grams) and the contribution of carbohydrate consumption to energy is 484.68 kcal (34.62%) based on the recommended daily RDA.

Protein consumption in toddlers aged 1-3 years has an average of 15.64 grams and the contribution of protein consumption to energy is 62.56 kcal (4.63%) based on the recommended daily RDA. For toddlers aged 4-5 years have an average protein consumption of 26.57 grams and the contribution of protein consumption to energy is 106.28 kcal (7.59%) based on the recommended daily RDA.

Fat consumption in toddlers aged 1-3 years has an average of 24.7 grams and the contribution of fat consumption to energy is 222.3 kcal (16.46%) based on the recommended daily RDA. For toddlers aged 4-5 years have an average fat consumption of 29.29 grams and the contribution of fat consumption to energy is 263.61 kcal (18.82%) based on the recommended daily RDA. Consumption of energy adequacy for toddlers aged 1-3 years has an average of (732.32 kcal) with a percentage of energy adequacy level of (54.24%). For toddlers aged 4-5 years, the average consumption of energy adequacy is (854.57 kcal) with a percentage of energy sufficiency level of (61.04%).

Based on the results of the study that for energy consumption as many as 39 toddlers are in the deficit category, 3 toddlers are in the less category. For protein consumption, 13 toddlers are in the deficit category, 11 toddlers are in the less category, and 15 toddlers are in the moderate category. For fat consumption, 32 toddlers are in the deficit category, 9 toddlers are in the less category, and 1 toddler is in the moderate category. For carbohydrate consumption, 25 toddlers are in the deficit category, 10 toddlers are in the less category, and 7 toddlers are in the moderate category.

Based on the conclusions and implications, there are recommendations according to the author regarding the Consumption Analysis of Undernourished Toddlers at the Simpang Tiga

Pekanbaru Inpatient Health Center, namely for related institutions such as the Simpang Tiga Inpatient Health Center Pekanbaru to conduct counseling activities regarding knowledge of the diversity of food consumption and nutrients in ingredients. food. The recommendation for respondent mothers is that mothers should pay attention to and apply the types of food consumed by toddlers based on variety, number of servings, and based on the recommended adequacy.

## 5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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