

***Factors Related To The Event Of Less Nutrition  
In Children Age 37-59 Months In The Center Of Public Health In Kaubele  
District Biboki Moenleu  
North Central Timor Regency***

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**ABSTRACT**

*Malnutrition problems in children under five can be influenced by energy intake, protein intake and the incidence of diarrhea. The purpose of the study was a factors associated with the incident of malnutrition in children aged 37-59 months at The Center Of Public Health Kaubele Moenleu Biboki District North Central Timor Regency. This study was a correlation descriptive study with a cross sectional approach. The sample consisted of 78 toddlers at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency, taken by proportional random sampling technique. Data collection instrument using secondary data from weighing results, kuesioner, form SFFQ. Data analysis using chi-square ( $\alpha = 0.05$ ). The result of this study indicated that there were intake energy good 8 toddlers ( 10.3 % ), energy less 70 toddlers ( 89.7 % ); protein intake more 2 toddlers ( 2.6 % ), protein good 32 toddlers ( 41.0 % ), less 44 toddlers ( 56.4 % ); toddlers who do not diarrhea 36 toddlers ( 46.2 % ), diarrhea 42 toddlers ( 53.8 % ); toddlers normal weight of 30 toddlers ( 38.5 % ), toddlers weight less 48 toddlers ( 61.5 % ); There is correlation between intake energy , protein intake and the chain diarrhea with the genesis malnutrition in toddlers (  $p = 0.025$ ,  $p = 0.002$  and  $p = 0.000$  ). There is correlation between intake energy , protein intake and the chain diarrhea with the genesis malnutrition in toddlers 37-59 months in The Center Of Public Health Kaubele Biboki Moenleu District North Central Timor Regency.*

**Keywords** : *Intake of energi and protein, The Diarrhea, Malnutrition*

**INTRODUCTION**

Nutritional problems occur during the life cycle in humans. In the first two years of life, it is a critical period because during this period the growth and development of children is very rapid, both physically, psychologically, mentally and socially (Septiari, 2012).

3-5 years of age children become active consumers and

children have started to choose the food they like. At this age the child's body weight tends to decrease, because the child is active more and starts choosing or rejecting the food provided by his parents (Septiari, 2012). Toddlers are an age that is prone to experiencing nutritional problems, if at this age the growth and development of children does not occur optimally, it will become less

qualified human resources (DepKes, 2007). Undernutrition in children under five has a negative impact on physical and mental growth. Another result is a decrease in resistance, so that the incidence of infection can increase. A more serious impact is the emergence of disability, high morbidity and accelerated death (Rahim, 2014).

The prevalence of malnutrition in children under five years 2019 worldwide, namely 7.3% (WHO, 2019). In the 2017 Nutritional Status Monitoring Pocket Book Report, it shows that in Indonesia there are 14% with cases of malnutrition and 3.8% experiencing cases of malnutrition, this figure has increased when compared to 2013, namely cases of underfive malnutrition 13.9% and cases malnutrition of 5.7% with a percentage of underweight / underweight / undernourished (malnutrition + malnutrition) in the under-five group of 17.8% (DepKes, 2018). The prevalence of nutritional status of children under five (BB/U) in East Nusa Tenggara was good nutrition of 71.3%, malnutrition of 6.9%, and malnutrition of 21.3%. This figure is much higher than the percentage of national prevalence, which was 17.8% in 2017 (PSG 2017).

The problem of malnutrition in children under five can be influenced by two factors, namely direct and indirect factors. Direct causative factors that affect malnutrition are food intake of children under five and infectious diseases such as ARI and diarrhea. Meanwhile, indirect factors are education level, family income,

knowledge of maternal nutrition, number of family members, food availability and environmental sanitation hygiene. Nutrient intake is obtained from macro and micro nutrients. Macro nutrients such as energy, carbohydrates, protein and fat.

Inadequate energy intake is a risk factor for malnutrition. This condition will cause the body to respond by increasing the use of energy reserves such as muscle and fat. Reported by Shukla et al (2016) which states that an inadequate energy intake below 80% of the minimum requirement is 3.6 times (95% CI 1.4-9.3p <0.008) is more likely to suffer from malnutrition than normal consumption.

Inadequate protein intake is a risk factor for malnutrition. Lack of protein will have an impact on disruption of growth, development and productivity. The use of protein in the body is due to insufficient energy needs from carbohydrates and fat for the body, there will be an overhaul of protein in the body so that its function which is supposed to be growth and building substances will be hampered by its function, which over time will cause malnutrition even if too long will result in malnutrition. It was reported by Rahim (2014) who stated that low protein intake was 3.49 times more likely to suffer from malnutrition than adequate protein consumption (OR = 3.49). Low protein intake can cause the body to become easily infected with mucosal disorders,

Infectious diseases that are often suffered by toddlers are diarrhea and symptoms of acute respiratory infection (ISPA). Diarrhea is an

infectious disease that plays a role in malnutrition. Diarrhea accompanied by symptoms of nausea and vomiting can increase the loss of body fluids which can lead to dehydration and weight loss. This, if it lasts for a long time, can worsen the malnutrition and increase the malnutrition of children under five. It was reported by Rosari, Rini and Masrul (2013) which stated that underfives who experienced poor nutritional status were more likely to have diarrhea (18.9%) compared to toddlers without diarrhea (14.8%).

Based on the results of simultaneous weighing in September 2019 which were reported by nutrition officers at the Kaubele The Center Of Public Health, the number of children under five at Kaubele The Center Of Public Health was 669 under five who experienced a prevalence of malnutrition as much as 5.3% and underfives who experienced malnutrition as much as 20.17% , meanwhile toddlers who have normal nutritional status are 73.99%.

Residents at Kaubele The Center Of Public Health work as fishermen and some work as farmers, so their economic level is also low. Commonly consumed foods, namely rice and vegetables, are due to inadequate income, so it is rare to consume nutritious foods, especially sources of animal protein. The transition season for diarrhea outbreaks is increasing due to lack of clean water and the habit of people who still consume unripe drinking water.

## **METHODS**

The research design used is research descriptive correlation with a

cross-sectional approach where data concerning the free or risk variables and the dependent variable or consequential variable will be collected at the same time (Notoatmodjo, 2018).

The population in this study were children aged 37-59 months, totaling 228 toddlers at the Kaubele Public Health Center, Biboki Moenleu District, North Central Timor Regency. The sampling technique was proportional random sampling. The number of samples used as research respondents was 78 child respondents.

The inclusion criteria in this study were children aged 37-59 months and parents / caregivers of toddlers who were willing to be respondents. The exclusion criteria in this study were toddlers with very low body weight (severely underweight) and toddlers at risk of overweight.

The method of taking energy intake data used the SFFQ (Semiquantitative Food Frequency Questionnaire) questionnaire and the categories used for energy intake were good (> 105%), moderate (100-105%), less (<100%). The method of taking protein intake data used the SFFQ (Semiquantitative Food Frequency Questionnaire) questionnaire and the categories used for protein intake were less (<80%), good (80-100%), more (> 100%). The method of collecting data on the incidence of diarrhea used a questionnaire and the categories used for the incidence of diarrhea were no diarrhea in the last 14 days and diarrhea in the last 14 days. The method of taking data on the incidence of malnutrition uses secondary data from weighing results

from the health center and the category used for the incidence of malnutrition is underweight if,

Factors related to the incidence of malnutrition in children aged 37-59 months at the Kaubele Health Center, Biboki Moenleu District, North Central Timor Regency were analyzed using the Chi-square test ( $\alpha = 0.05$ )

technical implementation unit of the North Central Timor District Health Office. Kaubele The Center Of Public Health working area covers 8 village working areas, namely Tunbes Village, Luniup Village, Matabesi Village, Kaubele Village, South Oepuah Village, Oepuah Village, North Oepuah Village, and Tainsala Village.

Residents at Kaubele The Center Of Public Health work as fishermen and some work as farmers. For the energy and protein consumption of the community around the Kaubele Health Center area, in terms of quantity, quality is still lacking.

## RESULTS AND DISCUSSION

### A. Overview of the Research Location

Kaubele Community Health Center is located in Oepuah Selatan

Village, Biboki Moenleu District, North Central Timor Regency. Kaubele The Center Of Public Health is part of the

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Table 1. Frequency distribution of maternal education among children under five 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District North Central Timor Regency.

Mother's education	Frequency	Percentage (%)
Graduated from elementary school	50	64.1
Graduated from junior high school	15	19.2
Graduated from high school	12	15.4
College	1	1.3
<b>Total</b>	<b>78</b>	<b>100.0</b>

Based on table 1, it shows that the most children under five are graduated from SD, namely 50 mothers of children under five (64.1%) and the least education is tertiary education, namely 1 mother of under five (1.3%). There are 15 mothers under five (19.2%) with a junior high school graduation

### B. Respondent Characteristics

#### 1. Mother's Education

education and there are 12 children under five (15.4%) with a high school education.

The level of education and knowledge are aspects that influence efforts to improve community nutrition, which includes the level of family consumption (Khasanah and Wiwit, 2018). The results of this study are in

line with Nur Azikin's research (2016) that maternal education affects the nutritional status of children under five with p value = 0.001. Maternal education will affect the attitude and mindset of mothers in paying attention to food intake for toddlers, starting from finding, obtaining and receiving various information regarding the knowledge of toddler food intake so that it will affect the choice of food that will determine the

nutritional status of the toddler.

Based on the results of the interview, maternal education has no effect on the incidence of malnutrition among children aged 37-59 months at the Kaubele Health Center with the respondent's mother that most of the family consumption levels seen from the selection of foodstuffs have not varied in feeding due to access to food availability that is far from the city.

### 3. Mother's work

Table 2. Frequency distribution of maternal work among children under five 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District North Central Timor Regency.

Mother's job	Frequency	Percentage (%)
Housewife	69	88.5
Entrepreneur	5	6.4
Private employees	3	3.8
Government employees	1	1.3
<b>Total</b>	<b>78</b>	<b>100.0</b>

Based on table 2, it shows that the highest work of mothers under five is housewives, namely 69 mothers of children under five (88.5%) and the smallest work is civil servants, namely 1 mother of children under five (1.3%). There are 5 mothers under five (6.4%) who work as entrepreneurs and there are 3 mothers under five (3.8%) who work as private employees.

Mother's job is related to family income, so it can be said that the type of work can also determine a person to meet the nutritional needs of the family. The results of this study are in line with Suranandi and Chandradewi (2008) that even though the mother works outside the home while working, if she has sufficient knowledge, the mother can manage the time to care for her child.

### 4. Energy intake

Table 3. Frequency distribution based on energy intake for children aged 37-59 months at the Kaubele Health Center, Biboki Moenleu District North Central Timor Regency.

Energy intake	Frequency	Percentage (%)
Good (> 105%)	8	10.3
Less (<100%)	70	89.7
<b>Total</b>	<b>78</b>	<b>100.0</b>

Based on table 3, it shows that the category of energy intake at most is in the low category, which is 70 toddlers (89.7%), while the energy intake of toddlers with good categories is as many as 8 children (10.3%). The results of this study are in line with research by Rarastiti (2013), which showed that there were more toddlers with less energy intake, namely as much as 64.9% than toddlers with good energy intake, namely 35.1%.

According to the results of the 2018 Basic Health Research, the adequacy of energy consumption for children aged 0-59 months is 92.3% on average in East Nusa Tenggara, while the percentage of energy intake needs <80% is 22.3%. When compared with the results of this study, the percentage of less energy intake in the Kaubele The Center Of Public Health work area is greater than the national level.

The high percentage of insufficient energy intake is caused by most children consuming 2-3 times a day, but with a meal portion less than the average requirement of urt consuming ¼-1/2 cubic inches of rice. In addition, based on the interview, the type of staple food consumed by the respondents was rice 2-3 times a day, instant noodles 2-3 times a week. The types of side dishes that are usually consumed by the respondents are chicken eggs 3 times a week, chicken meat 2-3 times a month, pork twice a month, tofu and tempeh are rarely consumed because of their access from the city. Vegetables and fruit are sauteed pumpkin shoots, bananas, and mangoes. And the child's diet and intake are only with rice with vegetable sauce or salt. This is because food access is far from the city and market days are only available on certain days.

## 5. Protein intake

Table 4. Frequency distribution based on protein intake for children aged 37-59 months at the Kaubele Health Center, Biboki Moenleu District North Central Timor Regency.

<b>Protein Intake</b>	<b>Frequency</b>	<b>Percentage (%)</b>
More (> 100%)	2	2.6
Good (80-100%)	32	41.0
Less (<80%)	44	56.4
<b>Total</b>	<b>78</b>	<b>100.0</b>

Based on table 4, it shows that the category of protein intake at most is inadequate category, which is 44 toddlers (56.4%), while protein intake for toddlers with good categories is 34 toddlers (43.6%) and protein intake for toddlers with more categories is 2 toddlers (2.6%). The results of this study are in line with the research of Irianto (2016), which shows that there are more toddlers with less protein intake as many as 44 toddlers (48.9%) than toddlers with good protein intake as many as 36 toddlers (40.0%).

According to the results of the 2018 Basic Health Research, the adequacy of protein consumption for children aged 0-59 months in East Nusa Tenggara is an average of 104.7%, while the percentage of protein intake needs <80% is 22.1%. When

compared with the results of this study, the percentage of less protein intake in the Kaubele The Center Of Public Health work area is greater than the national level.

Based on the results of interviews with the semi-quantitative FFQ for protein source foods that are often consumed by toddlers, chicken eggs 3 times a week, chicken meat 2-3 times a month, pork twice a month, tofu and tempeh because they are rare because they are not affordable by the community. And based on the interview, toddlers also have irregular eating patterns and the food menu eaten by toddlers is not varied. The child's diet and intake are only with rice with vegetable sauce or salt. This is because food access is far from the city and market days only exist on certain days, namely Saturdays.

## 6. Diarrhea occurrences

Table 5. Frequency distribution based on the incidence of diarrhea among under-fives 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District North Central Timor Regency.

<b>Diarrhea occurrences</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Do not have diarrhea	36	46.2
Suffering from Diarrhea	42	53.8
<b>Total</b>	<b>78</b>	<b>100.0</b>

Based on table 5, it shows that out of 78 toddlers, more under five had diarrhea, namely 42 (53.8%) compared to those who did not suffer from diarrhea, namely 36 (46.2%). According to the results of the 2018 Basic Health Research, the prevalence of diarrhea in East Nusa Tenggara is 11.0%.

The results of this study are in line with research conducted by Jayani (2014), namely underfives who suffer from diarrhea more, namely 65.2% compared to toddlers who do not suffer from diarrhea 34.8%. Diarrhea experienced by children aged 37-59 months at the Kaubele Health Center is caused by a

lack of clean water and the habit of children under five who still consume drinking water that has not been boiled. The results of this study indicate that there is a relationship between drinking water treatment and the incidence of diarrhea in children under five in Buru Kaghu Village. This research is in line with the research conducted by Budi Hairani et al (2014) at the Beringin The Center Of Public Health, Tapin Regency, which states that there is a relationship between drinking water treatment variables and the incidence of diarrhea in children under five with a p value of 0.000.

## 7. Incidence of Malnutrition

Table 6. Frequency distribution based on the incidence of malnutrition among children aged 37-59 months at the Kaubele Health Center, Biboki Moenleu District North Central Timor Regency

<b>Incidence of Malnutrition</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Underweight if, -3 SD to -2 SD	48	61.5
Normal body weight if, -2 SD to +1 SD	30	38.5
<b>Total</b>	<b>78</b>	<b>100.0</b>

Based on table 6, it shows that out of 78 children, there are more underfives who are underweight, namely 48 underfives (61.5%) compared to toddlers who have normal weight, namely 30 underweight (38.5%). For

weight data using secondary data from the weighing results of toddlers in September at Kaubele Health Center. And based on the z-score calculation for the BB / U index, almost all respondents

are in the underweight category.

The prevalence of nutritional status of children under five (BW / U) in East Nusa Tenggara was good nutrition of 71.3%, malnutrition of 6.9%, and malnutrition of 21.3%. This figure is much higher than the percentage of national prevalence, which was 17.8% in 2017 (PSG 2017). The incidence of malnutrition at Kaubele The Center Of Public Health was higher than the NTT Riskesdas result and the national prevalence.

The state of malnutrition is influenced by the direct factors examined in this study are food intake and infectious diseases, namely the incidence of diarrhea. Food intake, especially energy intake and protein intake. The food intake studied used the semi-quantitative FFQ, namely the intake interview for the past month. The state of malnutrition at Kaubele The Center Of Public Health

is due to access to foodstuffs which are far from the city.

In underweight toddlers with insufficient energy intake and protein intake, most of them were in the low category, with a history of infectious diseases in the last month who had diarrhea in the last 14 years accompanied by vomiting. The concept of nutrition has a very complex dimensional factor. Food given to toddlers cannot meet the nutritional needs of toddlers, even though children's needs for various nutrients in toddlers are increasing. In children who get food that is not good enough, it can cause their immune system to weaken and become susceptible to disease so that it can affect their nutritional status (Waryono, 2010). Children who get enough food but often get sick may eventually suffer from malnutrition. Likewise for children who do not get enough food,

**8. The Correlation between energy intake and the incidence of malnutrition among children under five years of age at 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency.**

Table 7. There is correlation between energy intake and the incidence of malnutrition among children aged 37-59 months at the Kaubele Community Health Center, Biboki Moenleu District, North Central Timor Regency

Intake Energy	Incidence of Malnutrition				Total		<i>p value</i>
	Normal Weight		Less Weight		F	%	
Good	F 6	% 75.0	F 2	% 25.0	F 8	% 100	0.049

Less	24	34.3	46	65.7	70	100
<b>Total</b>	<b>30</b>	<b>38.5</b>	<b>48</b>	<b>64.1</b>	<b>78</b>	<b>100</b>

Based on the results of the chi square test, the p value =  $0.049 \leq \alpha$  (0.05) shows that there is correlation between energy intake and the incidence of malnutrition in children aged 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency. There is correlation between protein intake and the incidence of malnutrition among children aged 37-59 months at the Kaubele Community Health Center, Biboki Moenleu District, North Central Timor Regency.

Based on the interview, the types of staple food consumed by the respondents were rice 2-3 times a day, instant noodles 2-3 times a week. The types of side dishes that are usually consumed by the respondents are chicken eggs 3 times a week, chicken meat 2-3 times a month, pork twice a month, tofu and tempeh are rarely consumed. Vegetables and fruit are sauteed pumpkin shoots, bananas, and

mangoes. And the child's diet and intake are only with rice with vegetable sauce or salt. This is because food access is far from the city and market days are only available on certain days. There is public purchasing power but there is no food availability and access.

Toddlers who have less energy intake will experience malnutrition, due to insufficient nutrients that last a long time, resulting in tissue deterioration which is marked by weight loss and continues to malnutrition (Soediatama, 2010). The results of this study are in line with Syukriawati's research in 2011, where the results showed a relationship between energy consumption and malnutrition status with p value = 0.0036.

**9. The Correlation between Protein Intake and Incidence of Undernutrition in Toddlers 37-59 Months at Kaubele Public Health Center, Biboki Moenleu District, North Central Timor Regency**

Table 8. There is correlation between protein intake and the incidence of malnutrition among children aged 37-59 months at the Kaubele Community Health Center, Biboki Moenleu District, North Central Timor Regency

Intake Protein	Incidence of Malnutrition				Total		p value
	Normal Weight		Less Weight		F	%	
	F	%	F	%			
							0.002

More	2	100.0	0	0	2	100
Good	18	56.2	14	43.8	32	100
Less	10	22.7	34	77.3	44	100
<b>Total</b>	<b>30</b>	<b>38.5</b>	<b>48</b>	<b>61.5</b>	<b>78</b>	<b>100</b>

Based on the chi square test, the value of p value =  $0.002 \leq \alpha$  (0.05) shows that there is a correlation between protein intake and the incidence of malnutrition in children aged 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency. There is correlation between the incidence of diarrhea and the incidence of malnutrition in under five years of age 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency. Based on the results of interviews with the semi-quantitative FFQ for protein sources that are often consumed by toddlers, chicken eggs 3 times a week, chicken meat 2-3 times a month, pork twice a month,

tofu and tempeh are rarely consumed. This is because food access is far from the city and market days are only available on certain days. There is public purchasing power but there is no food availability and access.

If the inadequate protein consumption continues and lasts for a long time to eat, it will result in weight loss and will experience malnutrition (Wong et al, 2014) /. The results of this study are in line with research conducted by Syukriawati in 2011, where the results showed a relationship between protein consumption and malnutrition status with p value = 0.040, and research conducted by Hapsari showed that There is correlation between protein intake and malnutrition status ( p = 0.03).

**10. The Correlation between the incidence of diarrhea and the incidence of malnutrition in under five years of age 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency**

Table 9. There is correlation between the incidence of diarrhea and the incidence of malnutrition among children aged 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency

Diarrhea occurrences	Incidence of Malnutrition	Total	<i>P value</i>
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	Normal Weight		Less Weight				0.000
	F	%	F	%	F	%	
Do not have diarrhea	22	61.1	14	36.9	36	100	
Suffering from Diarrhea	8	19.0	34	81.0	42	100	
<b>Total</b>	<b>30</b>	<b>38.5</b>	<b>48</b>	<b>61.5</b>	<b>78</b>	<b>100</b>	

Based on the chi square test, the p value =  $0.000 \leq \alpha (0.05)$  shows that there is correlation between between the incidence of diarrhea and the incidence of malnutrition in children aged 37-59 months at the Kaubele Health Center, Biboki Moenleu District, North Central Timor Regency.

Diarrhea is closely related to the incidence of malnutrition. Every occurrence of diarrhea can cause malnutrition due to anorexia and reduced ability to absorb food juices, so that if there is prolonged diarrhea it will have an impact on children's growth and health (Subagyo, Bambang and Nurtjahjo, 2010).

The results of this study are in line with research conducted by Rosari, Rini and Masrul (2013) which states that under-fives who experience malnutrition are more likely to have diarrhea (18.9%) compared to toddlers without diarrhea (14.8%). Diarrhea is an infectious disease that plays a role in malnutrition. Diarrhea accompanied by symptoms of nausea and vomiting can increase the loss of body fluids which can lead to

dehydration and weight loss. Based on the results of interviews, many toddlers experience diarrhea because they often consume uncooked water. Diarrhea that occurs in children under five at the Kaubele Health Center is caused by consuming water that has not been boiled and this has become a culture in the local community. This research is in line with the research conducted by Budi Hairani et al (2014) at the Beringin The Center Of Public Health, Tapin Regency, which states that there is a correlation between drinking water treatment variables and the incidence of diarrhea in children under five with a p value of 0.000.

## CONCLUSION

There is a correlation between energy intake, protein intake, and the incidence of diarrhea with the incidence of malnutrition in children aged 37-59 months at the Kaubele The Center Of Public Health, Biboki Moenleu District, North Central Timor Regency.

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