

Effectiveness of High Protein Supplementary Feeding on The Nutritional Status of Toddler With Wasting Risk

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ABSTRACT

Toddlers in South Kalimantan who experience nutritional problems on indicators of Weight/Height, namely underweight category, at a prevalence of 5.5% above national figure of 3.9%. Data from Guntung Payung Health Center in showed there 38% of under-fives with underweight nutritional status and 9% of very thin nutritional status. One of preventive measures for undernourished toddlers is provision of supplementary food containing high protein. Research sample was 38 toddlers with a history of getting supplementary food High Protein for 3 months selected using purposive sampling method. Nutritional status of children under five was obtained using anthropometric method. BB/TB was used in assessing nutritional status with target of wasting toddlers. Research method using cross-sectional with statistical test using paired t-test with a significance level of <0.05. The results showed an increase in percentage of children under five with normal nutritional status from 65.8% to 68.4%. After not receiving high protein supplementary food, percentage of children under five with normal nutritional status decreased to 63.2%. There was no significant difference in nutritional status of children under five years old based on BB/TB. In addition, there's no difference between nutritional status of children under five after implementation of supplementary food Recovery and during study.

Keywords: Wasting, Toddler Nutritional Status, protein

INTRODUCTION

Indonesia is a developing country that has complex problems, especially in terms of nutrition. The trend of nutritional problems in Indonesia is the triple burden of malnutrition which includes overweight (overweight), chronic malnutrition which is characterized by short stature (stunting), and poor nutrition (wasting). Poor nutritional status in toddlers will affect growth, development, intelligence, and can cause other diseases.¹ One of the factors that affect a person's level of health is good nutritional status.² Assessment of nutritional status plays a role in knowing whether there is a problem with a person's nutritional status, is carried out through the measurement of several parameters which then the results are compared with standards or references.³

Assessment of nutritional status includes anthropometric measurements, collection of information on clinical and biochemical medical history, dietary practices, medications taken, and the situation of food security.⁴ Adequate nutrition is very important at five years the first is to ensure that the child grows up healthy,

organs are formed with proper function, the formation of a strong immune system, and the development of the system neurological and cognitive.^{5,6} Nutrition in the first five years will affect the growth and development of children in the future. Malnutrition is prone to occur in the toddler age group so attention needs to be given to this age group.⁷ The impact that can arise from malnutrition in the first five years is impaired brain development and physical growth as a short-term impact while in the long term the impact that can arise is a high risk of developing non-communicable diseases in adulthood.^{8,9} Somebody Children with below-average height, weight, and BMI in early life followed by rapid weight gain in children are more likely to develop cardiovascular disease. Impaired growth due to malnutrition in childhood causes overweight and obesity in adulthood with a greater risk of cardiovascular disease.^{10,11}

The nutritional status of children under five in Indonesia is still a public health problem when viewed from the nutritional problem threshold. The 2018 Basic Health Research

(Riskedsdas) shows that Nationally, underweight and severely underweight toddlers are 17.7%, short and very short toddlers are 30.8%, and very thin and underweight are 10.2%.¹²

Nutritional problems in South Kalimantan need to be given more attention. This is because toddlers (aged 0-59 months) who experience nutritional problems in the Weight/Height (BB/TB) indicator, namely the malnutrition category, are at a prevalence of 5.5% above the national figure of 3.9%, while the city of Banjarbaru the category of malnutrition is at 6.2%, which is above the provincial figure of 5.4%.¹² Secondary data collection at the Guntung Payung Health Center Banjarbaru based on BB/U, there are children under five with poor nutritional status as much as 36% and poor nutritional status as much as 11%.¹³

Wasting or underweight is an indication of malnutrition based on the BB/PB or BB/TB index as a result of the occurrence in a short time of an acute event such as famine and disease outbreaks that cause children to be thin.¹⁴ Being Underweight in children can impair immune system function, leading to an increase in severity; duration; and vulnerability of children to infectious diseases, as well as increasing the risk of death.¹⁵

Supplementary Feeding High Protein is given in the form of milk containing high protein given together with supplementary food Recovery is a program carried out by the government for the toddler age group which is intended as an addition to the daily main food to overcome nutritional deficiencies. High Protein supplementary food is given to help meet the nutritional adequacy of toddlers, especially underweight toddlers.^{16,17} High Protein supplementary food contains a minimum of 180 calories, 9 grams of protein, and 4 grams of fat per 39 grams/190ml. Based on the technical instructions for giving, the main target for providing additional food is that toddlers aged 6-59 months are categorized as underweight based on the results of measurements of body weight according to length/height (BB/PB or BB/TB) with a value of less than minus two standard deviations (<-2 SD). with the duration of administration is 90 days or 3 months.

Research conducted by Septiana regarding changes in the nutritional status of wasting toddlers after giving high-protein supplementary food for 3 months showed that there were differences in changes in the nutritional status of toddlers before and after supplementary food Recovery according to the anthropometric index of BB/U. Based on the

BB/TB index, after giving the High Protein supplementary food, the prevalence of very underweight toddlers decreased from 100% to 40.9%, while based on the BB/U index from 86.4% of toddlers with very low body weight, it decreased to 59.1%.¹⁸ Another study conducted by Rizka regarding the provision of high-protein drinks affects the nutritional status of malnourished toddlers, giving the results that there are differences in the nutritional status of toddlers before and after the administration of supplementary food recovery. Differences in nutritional status of children under five years old. Based on the anthropometric index of BB/TB, the prevalence of very thin toddlers from 100% after giving supplementary food to normal toddlers was 18.2%, underweight toddlers were 40.9%, and toddlers were very thin at 40.9%.¹⁹

This study was conducted on toddlers who get High Protein Milk supplementary food in the working area of the Guntung Payung Health Center. High Protein supplementary food received by toddlers is in the form of milk which is drunk for 90 days. The researcher conducted a preliminary study at the Guntung Payung Health Center to find out the implementation of the Recovery Supplementary Feeding program by the Government including the number of participating toddlers, the nutritional status of toddlers before receiving the Recovery supplementary food, and the nutritional status of toddlers three months after receiving the Recovery supplementary food. The results showed that of the 69 toddlers who participated, 58% of the total participants experienced an increase in the z-score value based on BB/TB and the rest did not experience an increase. Following up on the results of the supplementary food Recovery program held by the Guntung Payung Health Center, the researchers wanted to know the nutrition of toddlers after the supplementary food Recovery program. Based on the description of the problem, this study aims to analyze the differences in the nutritional status of toddlers before and after the Provision of Supplementary Food Recovery plus High Protein supplementary food and differences in the nutritional status of toddlers after High Protein supplementary food and when they don't get High Protein supplementary food in the working area of the Puskesmas Guntung Payung.

METHOD

This research is an observational study with a cross-sectional research design. The location of the research is in the working area of the Puskesmas Guntung Payung, Banjarbaru

City. The research was carried out in January-February 2019, or after 5 months of completing the supplementary food Recovery program. In this study, the population used were all children under five in the working area of the Guntung Payung Health Center who had received high protein supplementary food. The sample in this study was 38 children under five from the entire population who had met the research inclusion criteria. All sampling technique was used in selecting the sample. The inclusion criteria for this study were toddlers who had received high-protein supplementary food, toddlers who did not have a history of severe congenital abnormalities, and toddlers have no history of preterm birth. The exclusion criteria in this study were toddlers who dropped out of the supplementary food Recovery program. The BB/TB index is used as a comparison because it is based on technical guidelines for providing additional food, the main target supplementary food is High Protein toddlers are skinny toddlers. Before the High Protein supplementary food program was implemented, the Guntung Payung Health Center did the selection first children under five who will participate in the program. Toddlers who are selected to participate in the High Protein supplementary food program are determined through monthly weighing and measurement results. Toddlers selected to participate in the High Protein supplementary food program are toddlers with nutritional status based on anthropometric measurements with the BB/TB index included in the thin and very thin categories, in addition to toddlers whose body weight is below the red line and toddlers with no increase in body weight were also selected to participate in the High Protein supplementary food program. The supplementary food provided contains a special formulation in the form of milk.

Characteristics of respondents were collected through the interview method using a questionnaire covering data on characteristics of toddlers such as age and gender of toddlers,

as well as family characteristics such as father's education, mother's education, father's occupation, and mother's occupation. Assessment of high protein supplementary food consumption was not carried out quantitatively because there were no records regarding the amount of high protein supplementary food consumption for toddlers so toddlers were only asked to ask toddlers to consume high protein supplementary food consumption or not.

Anthropometric methods are used in assessing the nutritional status of children. The nutritional status of children under five was determined using anthropometry with parameters of weight and length/height. The measurement results obtained are then calculated with the z-score with the BB/TB index using the Emergency application Nutrition Assessment (ENA) for SMART with 2006 WHO standards setting. Weight measurement for toddlers is done using a digital scale, while height measurements for toddlers are done using a microtoise.

The paired t-test was used to compare the nutritional status of toddlers before and after High Protein Supplementary Feeding and to compare the nutritional status of toddlers after High Protein supplementary food to compare the nutritional status of toddlers after High Protein supplementary food and when they didn't receive High Protein supplementary food 3 months in the two groups, research data are presented in tabular form and graph.

RESULT AND DISCUSSION

The distribution of respondent characteristics includes the characteristics of children under five, namely age, gender, history of LBW, history of exclusive breastfeeding, the incidence of diarrhea, and consumption of supplementary food, and family characteristics, namely father's education, mother's education, father's occupation, and mother's work are presented in table 1.

Table 1. Frequency Distribution of Parents' Education, Parents' Occupation, Gender of Toddlers, Age of Toddlers, and Consumption of supplementary food

Variable	Frequency	Percentage (%)
Parental Education (Father)		
Not completed in primary school	0	0
Primary school	6	15.8
Junior high school	5	13.2
Senior High School	25	65.8
College	2	5.3

Variable	Frequency	Percentage (%)
Parental Education (Mother)		
Not completed in primary school	2	5.3
Primary school	5	13.2
Junior high school	8	21.1
Senior High School	23	60.5
College	0	0
Parents Job (Father)		
Doesn't work	2	5.3
Private employees	19	50
Entrepreneur	3	7.9
Laborer	14	36.8
Parents Job (Mother)		
Doesn't work	32	84.2
Private employees	2	5.3
Entrepreneur	1	2.6
Laborer	3	7.9
Gender		
Boy	13	34.2
Girl	25	65.8
Toddler Age (Months)		
12-36	16	34.2
37-59	22	65.8
Consumption Of High Protein Supplementary Food		
Completed	9	23.7
Not Completed	29	96.3

Source: Primary Data 2022

In this study, the gender of children under five was mostly female, namely 65.8%. A person's nutritional needs, the size of which is determined by gender, boys need more energy and protein than girls. The age of toddlers mostly ranged between 37-59 months by 57.9%. Toddler age is a time when growth and development run rapidly, begin to be exposed to infection, and are physically active so that their nutritional needs must be met by taking into account the activity and state of infection.²⁰ Increasing age is directly proportional to the increase in the number of nutritional needs.²¹ 73.7% of toddlers do not consume finished the supplementary food given, when asked the reason for not consuming it, some answered

that toddlers did not like milk. Most of the fathers of toddlers have a high school education level, namely 65.8%. Likewise, with mothers of children under five, as much as 60.5% of mothers of children under five have a high school education level. 50% of fathers under five have jobs as private employees. Temporary. that most of the mothers of toddlers do not work. The level of education and occupation of parents are referred to as external factors that affect toddler nutrition.²². Good education for parents makes them able to receive all information, especially child care in a good way so that parental education becomes one of the important factors in growth and development.²²

Table 2. Distribution of the Nutritional Status of Wasting Toddlers at the Guntung Payung Health Center Banjarbaru

Nutritional status	Before Supplementary Protein		After Supplementary Protein		After not receiving Supplementary protein	
	n	%	n	%	n	%
<-3SD (Very thin)	0	0	0	0	1	2.6
-3SD s/d -2SD (Thin)	13	34.2	12	31.6	13	34.2
-2SD s/d +2SD (Normal)	25	65.8	26	68.4	24	63.2

Source: Primary Data 2022

Data on the nutritional status of children under five are presented in table 2. The table contains the nutritional status of children under five before the implementation of the supplementary food Recovery program, the nutritional status of toddlers after 3 months of supplementary food Recovery, and the nutritional status of children under five during the study. In addition to being presented in the table, the percentage of nutritional status of children under five is also presented in graph 1. Prior to the implementation of the study, it was known that 34.2% had underweight

nutritional status and 65.8% had low nutritional normal nutrition. After 3 months of implementation, the results of weighing and measurements showed that 31.6% of children under five had underweight nutritional status and 68.4% had normal nutritional status. Then, when the study was carried out weighing and measuring there were under five respondents, 2.6% of toddlers had a very thin nutritional status, 34.2% of toddlers had underweight nutritional status, and 63.2% had normal nutritional status.

Table 3. The difference of nutritional status before, after, and after not receiving supplementary protein

Nutritional status (z-score)	Mean	SD	95% CI		P value*
			Lower	Upper	
Before Supplementary Protein	-1.47	0.87	-2.96	0.49	0.585
After Supplementary Protein	-1.45	0.86	-2.81	0.62	
After not receiving Supplementary protein	-1.58	0.90	-3.36	0.29	0.430

Source: Primary Data 2022

Table 3 shows the average z-score of toddlers before supplementary food Recovery was -1.47 with a minimum z-score of -2.96 and a maximum of 0.49. Then after 3 months of supplementary food Recovery, the average z-score for toddlers was -1.45 with a minimum z-score of -2.81 and a maximum of 0.62. Furthermore, during research, the average z-score for toddlers is -1.58 with a minimum z-

score of -3.36 and a maximum of 0.29. The statistical test of two paired samples showed that there was no significant difference in the nutritional status of the index. Toddlers BB/TB before the supplementary food Recovery program and after the supplementary food Recovery program indicated by the value $p=0.585$ ($p>0.05$).

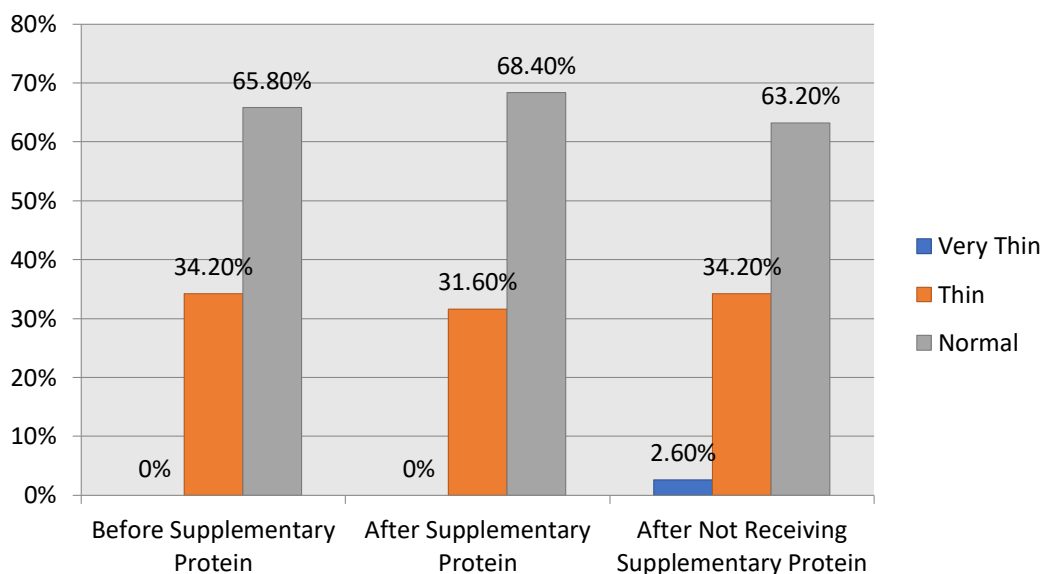


Figure 1. Graph of Percentage Change in Nutritional Status of Toddlers at Risk of Wasting

The study gave similar results that there was no significant difference in the mean change in the Z-score value of the anthropometric index BB/TB before and after supplementary food Recovery while on the anthropometric index BB/U there was a significant difference in the mean change in the z-score value, this can be caused by the anthropometric index of BB/U tends to be more sensitive to sudden small changes that affect the measurement of body weight, while height has a lower sensitivity to nutritional deficiencies in the short term²³. Similar results were also shown by research conducted at Sukatani Health Center and Pasirukem Health Center, Karawang Regency. Feeding Supplementation in the form of milk and biscuits which lasted for three months was not effective in improving the nutritional status of children under five based on indicators of BB/TB. The results of this study contradicted the research in Semarang which stated that after giving supplementary food, recovery for 60 days was found to be different in nutritional status based on BB/TB caused by the contribution of energy and protein intake from supplementary food Recovery consumed by toddlers has increased every week.²⁴ Research conducted in Banyumas and Kediri showed results that there is a difference in the weight of toddlers before and after supplementary food Recovery which means supplementary food Recovery is effective for changes in toddler weight. Improving children's health status can be influenced by the continuous provision of quality supplementary food whose contents are able to help meet nutritional needs.²⁵

Changes in the nutritional status of children under five can be caused by compliance with the consumption of High Protein supplementary food Milk. In this study, most of the toddlers had not consumed the High Protein supplementary food biscuits optimally (23.7%). The provision of supplementary recovery food contains nutrients that can help increase the fulfillment intake of toddlers so that most of the daily intake levels can be met²⁶. Consumption of high protein milk obediently helps meet adequate intake accompanied by adequate food consumption, adequate intake can lead to an increase in nutritional status. Consumption of supplementary food Recovery can help meet the energy and protein needs of toddlers who suffer from malnutrition so that if given properly it can lead to better nutritional status.²⁷ In the study of giving biscuits enriched with African catfish flour protein in Sukabumi, it is known that the level of compliance of biscuit consumption with nutritional status also shows

a significant relationship.^{28,29}

The results of the t-test of two paired samples showed that there was no significant difference in the nutritional status of infants with BB/TB index after High Protein supplementary food and at the time of the study indicated by the value of $p=0.430$ ($p>0.05$). The data obtained showed that after 5 months of supplementary food Recovery there was a decrease in the percentage of toddlers with normal nutritional status from 68.4% to 63.2% and 2.6% of toddlers with very thin nutritional status were found. In addition, it is known that there is a decrease in the average z-score of toddlers during the study after 3 months of supplementary food Recovery of 0.13. This study analyzed differences in the nutritional status of children under five while receiving high-protein supplementary food and after not receiving high-protein supplementary food, but the researchers did not examine other variables such as the relationship between high-protein supplementary food consumption and nutritional status. In this study, an assessment of the consumption of supplementary food Recovery could not be carried out quantitatively because there was no record of the consumption of high-protein supplementary food milk for toddlers. Supplementary feeding is one of the supplementation strategies for overcoming nutritional problems. The provision of additional food aims to increase nutritional intake which can ultimately improve the nutritional status of the target. In this study, it was found that there was no difference between nutritional status before and after the study, although there was an increase in the average z-score of toddlers after High Protein supplementary food. There was no difference between the nutritional status of toddlers after High Protein supplementary food and during the study, besides that there was a decrease in the average z-score of toddlers during the study. It is necessary to conduct further evaluation regarding the provision of additional food, especially analysis related to the decrease in nutritional status after not receiving High Protein supplementary food.

CONCLUSION

The results showed that there was no difference in the nutritional status of children under five before the implementation of the supplementary food Recovery program and after the implementation of the high-protein supplementary food. In addition, there is no difference between the nutritional status of children under five after the implementation of supplementary food after not receiving supplementary protein, it is known that there is

a decrease in the percentage of children under five with normal nutritional status after not receiving supplementary protein. Researchers recommend to researchers who want to do further research look for factors that cause a decrease in the nutritional status of toddlers after not receiving high-protein supplementary food.

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