

NUTRITIONAL COUNSELING AND WEIGHT GAIN FOR MALNOURISHED TODDLERS

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Received date: 29 September 2021

Revised date: 20 October 2021

Accepted date: 10 November 2021

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ABSTRACT

Introduction: Nutritional status is an important health indicator for children under age five who are vulnerable to nutritional and health problems. The first two years of life are a critical period, growth and development occur very rapidly during this period. The main factors in the occurrence of nutritional problems directly are inadequate consumption and infectious diseases, and other factors such as child care. The profile of South Sumatra Provincial Health Office in 2013 recorded children under five with undernutrition as much as 7.25%. This study aims to determine the effect of nutritional counselling on families on weight gain of undernourished children under five who received additional food with purple sweet potato formula biscuits. **Methods:** The design of this research is a randomized control trial (RCT). The intervention carried out was the provision of nutritional counselling guided by the pocketbook and supplementary food of purple sweet potato formula biscuits for 30 days in the treatment group, while the comparison group was given additional food of purple sweet potato formula biscuits and pocketbooks without counselling. To determine the differences in body weight changes in the treatment group and the control group, independent statistics t-test with a significance level of 5% is used. **Results:** The results showed that there were statistically significant differences in the average weight of respondents before and after the intervention in both groups. **Conclusion:** This study proves that the family guidance model with nutritional counselling using pocketbooks can increase the weight gain of undernutrition children.

KEYWORDS: Nutritional counselling, pocketbooks, malnourished toddlers, supplementary food, Purple Sweet Potato formula biscuits.

INTRODUCTION

All children with poor nutritional status, thin or very short, have a high risk of death and need special nutritional support.^[1] Severe or mild malnutrition is closely related to increased growth and development barriers.^[2]

Supplementary/complementary foods that are provided routinely and accompanied by nutritional counselling can increase growth and reduce the incidence of stunting.^[3] Providing supplementary food in the form of ready meals to children with poor nutritional status can reduce wasting.^[4] The level of health knowledge is significantly related to maternal behaviour in terms of parenting and the nutritional status of infants.^[5]

Based on data from the South Sumatra Provincial Health Office in 2013, the prevalence of malnutrition in toddlers

in Palembang city was 0.6%, while under-fives with malnutrition were 7.3% (Palembang City Health Office, 2015).

Previous studies have shown a significant increase in body weight in malnourished children who were given purple sweet potato biscuits for 30 days.^[6] This study is a continuation of previous research with the addition of nutritional counselling variables to mothers of children under five with poor nutritional status who received additional food of purple sweet potato biscuits.

MATERIALS AND METHODS

This research is an experimental study using a Randomized Control Trial (RCT) design with a parallel design without matching. The study was conducted in the working area of Taman Bacaan Health Center and Sako

Health Center in Palembang city for approximately 6 (six) months.

The population in this study were toddlers suffering from malnutrition and/or stunting, while the sample in this study was part of the population selected according to the inclusion criteria and exclusion criteria that had been set. Determination of respondents begins with nutritional screening to get respondents who meet the criteria set by researchers. Subjects who met the study criteria were then divided into simple random sampling into two groups namely the treatment group and the control group.

The inclusion criteria set: a) toddlers with malnutrition status with z-score $-3\text{ SD} < -2\text{ SD}$, b) do not suffer from severe comorbidities such: pulmonary TB, congenital heart, c) not currently under TFC (Therapeutic Feeding Center). While the exclusion criterion is if there is a severe health disorder and is associated with the digestive system. The sample size of the treatment group is 30 people and the control group is 30 people.

The variables studied included before and after toddler bodyweight, mother's knowledge level, nutrient intake of toddlers during the study. Tools and materials used in this study include digital weight scales with an accuracy of 0.1 kg, a questionnaire to measure the level of knowledge, a 24-hour recall form that is used to measure energy and protein intake during the study, a pocketbook that is used as a guide in conducting nutritional counselling, purple sweet potato biscuits with an energy content of 385.6 kcal, protein 8.0 grams, fat 17.6 grams, and carbohydrates 48.8 grams given as supplementary food to the treatment group and control group.

Interventions given to respondents in the form of nutritional counselling using a pocketbook and giving 85 grams of purple sweet potato biscuits with 385.60 kcal of

energy content and 8.0 grams of protein are given every day for 30 days.

To measure changes in body weight, weight was measured before and after treatment, as well as the measurement of the level of knowledge. Measurement of all variables is carried out by nutritionists who are competent in their fields. The difference in the intervention in this study was nutritional counselling to the treatment group respondents using a pocketbook, while in the comparison group only the same pocketbook was given without nutritional counselling.

Nutrition counselling is given twice a week for 30 days carried out by nutritionists who are competent in their fields.

To see the difference in the average weight of the treatment group and the control group before and after treatment, a statistical test was performed using the dependent t-test. The effect of giving counselling using a pocketbook on the respondent's weight gain was done by testing the difference in the average difference in the respondent's weight gain in the treatment group and the control group using the independent t-test. This research has received ethical approval from the Ethics Commission for Health Polytechnic of Makassar Indonesia, with no: 647 / KEPK-PTKMKs / XI / 2017. All participants involved in this study have signed informed consent as a sign of agreement to participate in this study.

RESULTS

Table 1 explains that most (60.0%) of the education level of the respondent's head of household is the level of basic education (elementary, junior high), working as labourers as much as 93.0% with the majority (70.0%) having family members > 4 people. For the level of knowledge of nutrition and maternal health, most (76.7%) were classified as lacking.

Table 1: Respondent Characteristics.

Respondent characteristic	Treatment group		Control Group	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	13	43.3	15	50.0
Female	17	56.7	15	50.0
Age				
6-11 month	1	3.3	2	6.7
12-59 month	29	96.7	28	93.3
Birth weight				
Low Birth Weight	9	30.0	3	10.0
Normal	21	70.0	27	90.0
Father's Education				
Basic Education	18	60.0	13	43.3
High School	12	40.0	17	56.7
Father's Occupation				
Laborer	28	93.0	15	50.0

Employees	2	7.0	15	50.0
Family member's				
>4 person	21	70.0	20	66.7
<4 person	9	30.0	10	33.3
Mother's level of knowlegde				
Less	23	76.7	13	43.3
Good	7	23.3	17	56.7

Table 2 explains the level of energy and nutrient intake of respondents in both the treatment group and the control group. The energy intake of some respondents is

still relatively lower than the recommended adequacy, where the intake of Energy (26.7%), Protein (36.7%), Fat (40.0%), and Carbohydrates by 36.7%.

Table 2: Distribution of Respondent Base on Nutrient Intake.

Nutrient Intake	Treatment Group		Control Group	
	<i>n</i>	%	<i>n</i>	%
Energy intake level				
Less	8	26.7	10	33.3
Good	22	73.3	20	66.7
Protein Intake Level				
Less	11	36.7	14	46.7
Good	19	63.3	16	53.3
Fat Intake Level				
Less	12	40.0	15	50.0
Good	18	60.0	15	50.0
Carbohydrate Intake Level				
Less	11	36.7	11	36.7
Good	19	63.3	19	63.3

Table 3 shows the results of statistical tests (dependent t-test) in the treatment group, it can be concluded that there are differences in average body weight before and after treatment in the form of supplementary food, sweet potato formula biscuit, and nutritional counselling using

a pocketbook. In the control group, there were significant differences in the average body weight of respondents before and after they were given purple sweet potato biscuits and pocketbooks.

Table 3: Differences in average body weight before and after treatment.

Group	Mean before \pm SD	Mean after \pm SD	<i>p</i>	<i>t</i>
Treatment	9.613 \pm 1.6598	10.227 \pm 1.6719	0.000	-26.258
Control	8.783 \pm 1.5733	9.263 \pm 1.7038	0.000	-8.331

The results of statistical tests using independent t-test showed that there was a difference in the average weight gain of children under five in the treatment group and the control group with p-value 0.0 and <0.05. The results of this study concluded that there was an effect of providing nutritional counselling to families on weight gain of malnourished toddlers who received Purple Sweet Potato Biscuits.

Table 4: The effect of nutritional counselling using a pocketbooks to the weight gain of toddlers.

Group	Difference in average	<i>t</i>	<i>p</i>
Treatment	0.6133	2.145	0.03
Control	0.4800	2.145	

DISCUSSION

Average Nutrition Intake

Intake is very important for children under five because it is known that children under 5 years are more susceptible to malnutrition problems.^[7] Among other health problems faced by children under five, nearly 34% of child mortality and unknown side effects are mainly caused by malnutrition.^[8]

Consumption of foods rich in protein, calories, and micronutrients given to malnourished children can overcome the problem of malnutrition.^[7] Purple sweet potato biscuits are one of the high-calorie and good nutritional additives. In this study children under five who experience nutritional problems mostly come from families with low socioeconomic status, malnutrition problems indeed often occur in low socioeconomic groups. This is due to the low income that will affect family access to food which impacts on nutritional status

because the intake of micronutrients consumed tends to be low.^[9]

Table 1 shows that most of the household heads (fathers) of respondents in this study work as casual daily labourers, which of course has an impact on the limited family income. Limited family income will affect the availability of food at the household level.

The low economic status of the community results in more food products being sold than consumed, so that food needs for the household are not fulfilled which has an impact on malnutrition status.^[10]

Apart from low socioeconomic conditions, poor maternal nutritional knowledge and feeding practices are found to predispose to malnutrition in children.^[11] Nutrition education or nutritional counselling that emphasizes food-management skills is an effective way of overcoming the problem of malnutrition^[12], in addition to nutrition counselling, supplementary feeding provided can improve nutritional status in children under five.^[3]

Mothers who do not provide balanced food, do not have good knowledge of breastfeeding, and also do not have knowledge about supplementary feeding to children greatly affect the nutritional deficiencies in children, therefore the role of mothers in preparing balanced and varied nutritious foods derived from food ingredients can overcome malnutrition in children.^[12]

Average Weight Increase

The results of this study prove that purple sweet potato biscuits additives can increase underweight toddlers underweight. Increases in average body weight were more common in the treatment group from before to after treatment, which amounted to 0.61. That is because the treatment group is given counselling by trained nutrition workers and pocketbooks to each respondent which in the pocketbook discusses family balanced nutrition that can have an impact on weight gain under five.

The effectiveness of balanced nutrition counselling in accordance with the local culture can improve community nutrition education^[13], in addition, counselling provided by trained nutritionists regarding the types of food available locally can encourage growth in children.^[14]

In this study as many as 60% of the respondents' mothers had poor nutritional knowledge, this affected the nutritional status of children under five. Poor maternal nutritional knowledge and wrong feeding are a prediction of malnutrition in children under five.^[11] Whereas mothers of children under five who have high nutritional knowledge have children with normal nutritional status because of the high level of maternal nutritional knowledge affecting eating habits in children.^[15] Then nutritional counseling is treated to increase maternal

nutrition knowledge so that it can overcome the problem of malnutrition in children under five.^{[16],[12]}

Mother Knowledge

In this study the level of knowledge was categorized as good and insufficient, mothers with insufficient levels of knowledge were in the treatment group of 23 people (76.7%). this is because the mother's education is at the level of primary education.

The level of education will affect the level of knowledge of someone.^[17] The mother's education level has a significant effect on the nutritional status of children under five.^[18]

Mothers' education has an important role in reducing the problem of malnutrition in children under five so providing nutrition education programs for women especially those who have low levels of education will help them achieve better nutritional outcomes for their children.^[19]

Other research states that mothers who do not give their children a balanced diet and do not have good breastfeeding knowledge and knowledge of a good time to provide food show contributing to child nutrition. Whereas mothers who give breast milk and prepare balanced meals from local foods can reduce the nutritional status of the child.^[20]

Nutrition education can reduce malnutrition rates for families that have household food availability.^[16] Other studies also say that maternal nutritional knowledge is a strong predictor affecting children's eating habits. From the results of interviews about food intake in mothers of children under five, children under five who are malnourished are accustomed to consuming unhealthy snacks, this causes children to be full so that good food intake for children is not fulfilled, one of the causes is supervision from parents and also a lack of knowledge mothers regarding good food consumed for their children.

Mothers who have a good level of nutritional knowledge provide more vegetables, fruit, nuts and give fewer drinks and fast food.^[15]

The Effect of Nutrition Counseling Using a Pocket Book on Weight Gain

The results of the average difference between treatment groups and comparison groups proved that family assistance with the purchase of nutritional counselling and supplementary feeding such as the purple sweet potato biscuits could affect increasing underweight children underweight nutrition.

These results are in line with several previous studies that children who are given daily complimentary foods and accompanied by nutritional counselling influence linear growth in children under five.^[3] Low values of

dietary diversity, age of inappropriate supplementary feeding are significant predictors of stunting.^[21]

Mother's nutritional knowledge can affect the nutritional status of children, mothers who have insufficient nutritional knowledge tend to provide inadequate food for their children, thereby affecting the nutritional status of children under five.^[11]

For this reason, nutritional counselling with an emphasis on a balanced diet is an effective way to improve nutrition knowledge in overcoming the problem of malnutrition.^[13] Overall, maternal education continues as a strong predictor of children's nutritional status.^[22]

Nutrition education has succeeded in reducing malnutrition in children under five in families with insufficient food availability.^[16] Other research also mentions that maternal education significantly influences the nutritional status of children as well as socioeconomic status and attitudes towards health services can also influence nutritional status.^[18]

Based on the results of statistical tests (t-independent) showed the influence of family assistance with the purchase of nutritional counselling and purple sweet potato formula biscuits on weight gain as indicated by the p -value $< \alpha$ 0.05. The increase in body weight of the treatment group was greater and more meaningful when compared to the comparison group which was not accompanied by counselling. Interventions in the form of nutrition education have a significant influence on the knowledge, attitudes, and practices of maternal nutrition and the nutritional status of children under five.^[23] This happens because counselling is effective in managing malnutrition, but is often weak or non-existent and must be strengthened. More attention needs to be given to formulating messages and improving skills. Therefore counselling must be appropriate and well-targeted so that the intent of the counselling can be accepted by respondents and can be practised in their daily lives.^[12]

CONCLUSIONS

Supplementary food will be more effective in increasing the weight of undernourished children under five if it is followed by providing nutritional counselling to families. Nutritional counselling using a pocketbook can increase the weight of malnourished toddlers who receive additional purple sweet potato biscuit formula.

ACKNOWLEDGEMENT

We would like to thank the leadership of the Taman Bacaan Community Health Center and Sako Community Health Center in Palembang city, and all respondents who have participated in this research, as well as to the Palembang Health Polytechnic for funding this research.

CONFLICT OF INTEREST

In this study, there is no conflict of interest.

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