Jurnal Info Kesehatan
Vol. 21, No. 4, December 2023, pp. 626-635
P-ISSN 0216-504X, E-ISSN 2620-536X
DOI: *10.31965/infokes.Vol21Iss4.1153*
Journal homepage:*http://jurnal.poltekeskupang.ac.id/index.php/infokes*

RESEARCH **Open Access**

Behavior of Providing Additional Recovery Food to Increase Weight of Malnourished Toddlers Aged 24-59 Months at Magetan District Health Center

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Received: 11 April 2023 Revised: 25 June 2023 Accepted: 28 September 2023

Abstract
The percentage of under-five malnutrition problems in Indonesia was 17.8%, with 3.8% and 14% of under-five cases being malnutrition. The Magetan Health Service reports that as of 2021, there were 332 cases of undernourished toddlers; however, the Panekan Health Center reported 116 cases of undernourished toddlers in 2020 based on weight/body length data. The undernourished toddlers was defined as those who were between the ages of 24 and 59 months. This kind of study employs secondary data sources, an analytical approach, a quasi-experimental design, and a non-equivalent control group design. This study included 73 toddlers as subjects: 31 toddlers who did not receive any nutrition, 42 toddlers who did receive nutrition, and malnourished toddlers aged 24-59 months. Data collection uses data collection sheets. The Independent and Paired t-tests are the analysis methods employed. The average difference in body weight between the two groups was found to be 0.594 with a range of 0.0324 kilograms – 1.156 kilograms. The study's results were obtained using the Paired t-test with a p-value = 0.000 with a significance level of 0.05 and the independent t-test with a p-value = 0.038 with a significance level of 0.05. The study concludes that supplementary feeding has an impact on the weight of undernourished toddlers at the Panekan Health Center who are between the ages of 24 and 59 months. It is hoped that by continuing to supplement food, the recovery program may decrease the number of undernourished children under five.

Keywords: Toddlers, Supplementary Food, Weight, Malnutrition.

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1. INTRODUCTION

Toddler nutrition is an indicator that demonstrates the level of community welfare because children under the age of five are a group that is vulnerable to health and nutrition (Hadi & Rahayu, 2022). To ensure that children have a healthy nutritional status, nutritional intake is crucial for their growth and development. Malnutrition is one of the main nutritional problems in Indonesia, so the government emphasizes the Healthy Indonesia (Umar et al., 2021). Initiative designed to enhance community health and nutrition, backed by equity in health service delivery and financial protection for the years 2015–2019. The National Medium-Term Development Plan for 2015–2020 includes enhancing mothers' and children's nutritional status as one of its primary goals. One health issue that adds to Indonesia's poor human resource (HR) quality is malnutrition (Kementerian Kesehatan Republik Indonesia, 2022).

Toddlers are a nutritionally vulnerable group; they easily suffer from nutritional disorders due to a lack of the food. The nutritional problems that must be faced in Indonesia at this time are the problem of undernutrition and overnutrition (Nurazizah et al., 2022). Overnutrition problems arise from societal economic progress combined with a lack of knowledge about nutrition and health. Undernutrition problems are caused by poverty, a lack of food supplies, unsanitary environments, and a lack of public awareness about nutrition and health (Kementerian Kesehatan Republik Indonesia, 2018).

According to the Ministry of Health's 2020 Nutritional Status Monitoring, the percentage of toddlers (those under five years old) who had nutritional issues in 2020 was 17.8%, which was unchanged from the previous year (Kementerian Kesehatan Republik Indonesia, 2020). This number incorporates 3.8% Malnourished Toddlers and 14% Undernourished (Kementerian Kesehatan Republik Indonesia, 2018). Whereas in East Java Province in 2017 the incidence of malnutrition was around 9.40%. Based on data from 2017, the Magetan District Health Office reported 332 cases of under-five malnutrition. According to Panekan Health Center weight-for-height (weight/height) data from 2020, there were 116 cases of undernourished toddlers (Dinas Kesehatan Magetan, 2022).

Malnutrition in children can have two main causes: underlying causes, indirect causes, and direct causes. Malnutrition has two primary causes: insufficient dietary intake and infectious diseases. Food that does not contain the necessary nutrients or insufficient amounts of food can lead to a lack of intake of nutrients. While infections impair the ability of various organs to properly absorb nutrients from food (Suharto et al., 2020).

Malnutrition in children under five can affect children's intelligence, decrease children's productivity, and low cognitive abilities. Toddlers are one of the groups that are vulnerable to health problems, the problem of malnutrition. Malnutrition in toddlers that is not immediately addressed will develop into severe malnutrition (Akombi et al., 2017). Low body resistance, which leaves the body vulnerable to infectious diseases, a lack of energy and protein that stunts toddlers' growth and development, an acute lack of energy and protein that can result in marasmus and kwashiorkor, physical and cognitive impairments, reduced IQ, iron deficiency anemia, and disorders resulting from iodine and vitamin A deficiency are consequences of malnutrition. This is due to the extremely rapid growth and development that occurs during the toddler stage (Teja, 2022).

The East Java Health Office initiated efforts in 2020 to enhance feeding practices for nutritional issues. nutrient-dense food assistance, supplemental food assistance for breast milk, patient care for malnourished toddlers, and referral nutrition are provided through the Recovery Supplementary Feeding Program. Furthermore, the East Java Health Office increased cross-sectoral support, convened with the food and nutrition team, and established a malnutrition recovery center and counseling at Posyandu or primary health unit (Dinas Kesehatan Jawa Timur, 2021). Likewise, Magetan Regency also provides Recovery to improve nutrition for

undernourished toddlers. The research aims to identify the effect of providing recovery supplementary food on undernourished toddlers at the Panekan Health Center in 2020.

2. RESEARCH METHOD

This research utilizes experimental research with secondary data sources (Suharto, Nugroho & Santosa, 2022). Following the research objectives, this research is a type of research that examines the effect of providing additional recovery food on the weight of toddlers aged 24-59 months (Heryana, 2019). This study employed a quasi-experimental design with a non-equivalent control group design (Ichsan, 2022).

Table 1. Research design non-equivalent control group.

	Pretest	Intervention	Post test
Experiment Group	O1	X	O2
Control Group	O1		O2

Information:
Experiment Group:
O1 : Pretest, which is weighing undernourished toddlers aged 24-59 months before being given Recovery Supplementary Food.
X : Treatment is provided Recovery Supplementary Food.
O2 : Posttest, which is weighing undernourished toddlers aged 24-59 months after being given Recovery Supplementary Food.

Control Group:
O1 : Pretest, which is weighing the weight of malnourished toddlers aged 24-59 months before.
O2 : Posttest, which is weighing the weight of malnourished toddlers aged 24-59 months after.

This research was conducted at the Panekan Magetan Health Center. When: The research was performed from February to May 2020. Research Population The population in this study was data on malnourished toddlers aged 24-59 as many as 89 toddlers for August 2020. The sample in this study were toddlers aged 24-59 months, totaling 73 toddlers. Sample criteria encompass: 1. Inclusion Criteria: These are the general qualities of research participants established from a reachable target population that will be the subject of the study. The following were the study's inclusion criteria: 1) Malnourished toddlers (ages 24-59 months) for August 2020. 2. Exclusion Criteria: For a variety of reasons, subjects who satisfy the inclusion criteria are eliminated from the study based on the exclusion criteria. Undernourished toddlers younger than 24 months and older than 59 months were the study's exclusion criteria. A total of seventy-three malnourished toddlers were used as study samples. Probability sampling combined with the Simple Random Sampling technique was the sampling method employed in this investigation (Nursalam, 2008; Nursalam, 2020). Sampling in this study was by making lots of 89 lots, and then 16 lots were shuffled to get a sample size of 73 toddlers.

Providing Supplemental Food for Recovery was the study's independent variable. The weight of toddlers between the ages of 24 and 59 months served as the study's dependent variable. Data collection techniques refer to the methods used to approach subjects to gather the necessary subject characteristics for a study (Worotitjan, Mintjelungan & Gunawan, 2013). The data collection technique for this research is secondary data obtained from the medical records of toddlers aged 24-59 months at Panekan Health Center in 2020. The research procedures implemented were: 1. Arrange for permits to Baskebangpol Magetan Regency. 2. Take care of permits in the field by submitting a permit letter and research approval to the

Panekan Health Center. Instruments are the tools employed for data collection (Elisanti & Ardianto, 2020). The instrument in this study was a data collection sheet.

Research Data Processing and Analysis Techniques. After the data is collected, data processing is conducted, (Nursalam, 2020). This study incorporated data on malnourished toddlers aged 24-59 months at the Panekan Health Center and selected which data to employ and not use. In this study, variables that received recovery were coded 2 and those that did not receive. Finding meaning or significance from study results in the form of broad research conclusions is the objective of analysis. To aid in the making of conclusions, the impact of additional recovery feeding on the weight of malnourished toddlers between the ages of 24 and 59 months was analyzed in this study. With the assistance of a computer program, a Paired t-test with a significance of 0.000 ($p < 0.05$) was conducted to examine the impact of Recovery on the weight of malnourished toddlers aged 24-59 months (Suharto, Nugroho & Santosa, 2022). This research has received ethical permission from the Ethics Commission for Health Polytechnic, Ministry of Health Surabaya with a number: No.EA/0350/KEPK-Poltekkes_Sby/V/2020.

3. RESULTS AND DISCUSSION

Description of Research Locations. The Magetan Regency Government maintains the Panekan Health Center, which is situated on Panekan No. 8 in Magetan Regency, East Java Province. BPJS Kesehatan First Level Medical Facilities, encompassing inpatient health centers, are located in Magetan Regency. With a population of 57,338 and an area of 64.2 km², Panekan is composed of 17 villages and sub-districts. It is located 6 km to the northwest of Magetan Regency's capital city, and Ngawi Regency borders the Panekan area on the north. The districts of Magetan and Sidoejo, which are located west of Mount Lawu in the Central Java Province, encircle the southern portion. The districts of Karas, Sukomoro, and Magetan encircle the eastern portion (Dinas Kesehatan Magetan, 2022).

The health program to reduce the number of undernourished children under five at the Panekan Community Health Center is a Recovery Supplementary Food Program in the form of local food and biscuits which are provided to undernourished and severely malnourished children aged 6-59 months (Suriani, et al., 2022).

Table 2. Weight of Malnourished Toddlers Aged 24-59 months before and after in the group that received and those who did not receive recovery food supplementation.

Toddler Group		Weight		N
		Before	After	
Get recovery food supplementation	Mean	10,540	11,098	42
	SD	1,3395	1,4105	42
No get recovery food supplementation	Mean	10,471	10,503	31
	SD	0,9606	0,9968	31
Total				73

It is clear from the table 2 show that there are 73 samples of malnourished toddlers between the ages of 24 and 59. With an SD before 1.3395 and an SD after 1.4105, 42 of the toddlers who were received had average weights before 10.540 and after 11.098. In contrast, 31 toddlers who did not receive recovery food supplementation had average weights before and after 10.471 and 10.503, respectively, with SDs before and after 0.9968.

Table 3. Paired t-test in the group of toddlers who received recovery food supplementation and did not receive recovery food supplementation.

Toddler Group	Weight	Mean	SD	*p-value*
Get recovery food supplementation	before – after	0.5571	0.4789	0.000
No Get recovery food supplementation	before – after	0.0323	0.1423	0.217

Table 3 show that it is identified, data analysis using the Paired t-test statistic in the group of toddlers who received possessed an average weight before and after 0.5571 with an SD of 0.4789 with a significance level of 0.05 obtained a p value 0.000 which means ($p < 0.05$). Therefore, it can be concluded that there is an effect on nutritional toddler weight at the Panekan Public Health Center for toddlers aged 24-59 months. H0 is then rejected and H1 is accepted. It can be stated that there is a significant difference between the weight of toddlers who received the first measurement (before weight) and the second measurement (after weight). On the other hand, the average weight of the toddlers in the non-PMT-P group was 0.0323 before and after, with an SD of 0.1423 at a significance level of 0.05. A p-value of 0.217 was determined, indicating that the data was significant ($p > 0.05$). Then H0 is accepted and H1 is rejected, thus it can be said that there is no significant difference between the weight of toddlers who did not receive in the first measurement (before weight) and the second measurement (after weight).

Table 4. Weight gain in the group of toddlers who received and did not receive Get recovery food supplementation.

	Toddler Group	Sum	Mean	SD
Weight	Get recovery food supplementation	42	11.098	1,4105
	No recovery food supplementation	31	10,503	0,9968

Table 4 illustrates that the sample of toddlers who received recovery food supplementation was 42 children, with an average weight of 11.098 kg. This demonstrates that children who received recovery food supplementation had an average weight that was higher than that of children who did not (11.098 > 10.503). In the meantime, 31 children, weighing an average of 10.503 kg, did not receive recovery food supplements.

Table 5. Independent t-test on toddlers who get recovery food supplementation and do not get recovery food supplementation

	Mean	Range		SD	p-value
		Maximum	Minimum		
Weight	0.5944	0.0324	1.1563	0.2818	0.038

Table 5 show that data analysis using the independent t-test statistical test with a significance level of 0.05 obtained a p-value of 0.038 which means ($p < 0.05$), thus, H0 is rejected and H1 is accepted so that it can be said that there is a difference in weight significant difference between toddlers who did not receive recovery food supplementation and those who received recovery food supplementation. The difference in average weight between the two groups was 0.594 kilograms, with a difference range between 0.0324 – 1.156 kilograms.

The previous body weight in the group of toddlers who received and did not receive recovery food supplementation. The number of undernourished toddlers aged 24-59 months was identified to be 73, with 42 toddlers in the group of toddlers who received recovery food supplementation and 31 in the group that did not. These findings were derived from tests that

were utilized to determine the average weight before and after in the group of toddlers who received recovery food supplementation and those who did not. Toddlers receiving recovery food supplements weigh on average less than 10.540 and have standard deviations of less than 1.3395. Toddlers without recovery food supplementation, on the other hand, had an average weight of 10.471 and a standard deviation before 0.9606. It can be concluded that the average weight before the toddler group who received P was higher, which is 10.540 (Suharto, Wildan & Handayani., 2020).

Weight before and after in the group of toddlers who received and did not receive recovery food supplementation. According to the results of tests implemented to determine the average weight before and after in the groups of toddlers who received and those who did not receive recovery food supplementation, there were 73 undernourished toddlers between the ages of 24 and 59 months. Of these, 42 toddlers received recovery food supplementation, and 31 toddlers did not receive it. The average weight and standard deviation of toddlers who received recovery food supplements were 11.098 and 1.4015, respectively. In contrast, toddlers who did not receive weighted averages after 10.503 and standard deviation after 0.9968. Hence, it can be concluded that the weight after the toddler group who received recovery food supplementation was higher, namely 11.098 (Suharto, & Santosa, 2023). The supplementary feeding program is still not utilized by a large number of families (PMT). Providing additional recovery food (PMT-P), whose nutritional value has been measured so that nutritional needs can be met, is one method to combat malnutrition. There is an effect of supplemental feeding on the growth of children under the red line, indicating that the growth of children under the red line influences the supplementary feeding intervention (Zakaria & Astuti, 2022).

Effect of Providing Recovery Supplementary Food on the weight of malnourished toddlers aged 24-59 months at the Panekan Health Center. Based on the Paired T-Test statistical test results, the toddler group that did not receive it had an average body weight before and after of 0.0323 with an SD of 0.1423 at a significance level of 0.05. A p-value of 0.217 was determined, indicating that the data are significant ($p>0.05$). It can be concluded that there is no significant difference in the weight of toddlers who did not receive the first measurement (before weight) and the second measurement (after weight) since H0 is accepted and H1 is rejected. However, the average weight of the toddlers in the receiving group was 0.5571 before and after, with a standard deviation of 0.4789 at a significance level of 0.05. This resulted in a p-value of 0.000, meaning that the difference was less than 0.05. After that, H0 is rejected and H1 is accepted. It is therefore possible to conclude that there is an effect of recovery food supplementation on nutritional toddler weight for toddlers aged 24-59 months because there is a significant difference between the weight of the toddlers who received the first measurement (before weight) and the second measurement (after weight) (Erlinawati, Apriza & Parmin, 2022).

This is consistent with the research, which indicates that a large amount of balanced nutrition is necessary to produce energy or power. Sources of calories stored from excess carbohydrates or carbohydrates (glycogen and fat) can affect body weight. In his research, toddlers' average weight after receiving food was 8629.41, with a p-value of 0.001, meaning that the weight of undernourished toddlers was affected by additional food ($p <0.05$) (Aty et al., 2021).

According to Edvina's research, malnourished toddlers between the ages of 6 and 48 months who underwent PMT displayed a range in body weight between 7.57 kg and 8.67 kg. Toddlers' nutritional status before receiving extra food was, at most, in the very poor category, according to 33 respondents (94.30%), and after receiving additional food, it was in the less category, in accordance with 22 respondents (62.90%). Body weight before and after PMT was different; the weight after PMT was 6.81% higher than the initial weight. The Wilcoxon test

yielded a significance value of 0.0001 (p <0.05), indicating that supplemental feeding has an impact on the nutritional status of malnourished toddlers between the ages of 6 and 48 months (Tat et al., 2020).

Toddler's weight after giving recovery food supplementation minimum weight is 6.5 kg while the maximum is 16 kg and the average is 8.8796 kg with a p-value of 0.000 while the significance of 0.05 which means there is an effective recovery food supplementation program for weight gain in toddlers in Banyumas Regency (Marlina et al., 2022).

The same is true of studies that discovered toddlers' average body weight was 9.0 kg, with the lowest body weight being 4.1 kg, before receiving recovery food supplements. The average toddler weight increased to 9.9 kg after receiving recovery food supplementation, with the lowest weight being 5.3 kg and the highest weight being 12.1 kg. A significance value of 0.000 with a p-value of less than 0.05 was obtained from the paired t-test results, indicating that recovery food supplementation has an impact on changes in toddler weight (Manurung et al., 2022).

A program of intervention for malnourished toddlers is supplemental feeding. Providing supplementary food to malnourished children in the nutritionally vulnerable group is generally intended to improve their nutritional status. This is performed based on the weight of children under five who have not gained weight in three consecutive months and whose weight on the KMS is below the red line (Mugianti et al., 2022). The objective of supplemental feeding is also to increase vital nutrients and energy. Meanwhile, the aim of feeding additional food to malnourished infants and toddlers is to attain optimal nutritional status by progressively introducing high-energy, high-protein, and adequate vitamin and mineral food in stages (Kementerian Kesehatan Republik Indonesia, 2020).

One way to overcome malnutrition that occurs in the toddler age group is to organize recovery food supplements. Food supplementation recovery for children aged 6-59 months is intended as a supplement, not as a substitute for the main daily food. PMT Recovery is intended to be based on local food ingredients with regional specialties adapted to local conditions. As was performed by the Panekan Health Center, they provide local food ingredients such as rice, eggs, green beans, and fruits (Latuihamallo et al., 2022).

The average weight of undernourished children aged 24-59 months between those who received and those who did not receive recovery food supplementation. Data analysis was performed using the Independent T-Test statistic test with a significance level of 0, 05 obtained a p-value of 0.038 which means (p <0.05) based on research that has been conducted to determine the average weight of undernourished toddlers aged 24-59 months between those who receive and those who do not receive recovery food supplementation. This implies that H0 is rejected and H1 is accepted, indicating that there is a significant weight difference between toddlers who receive recovery food supplementation and those who do not. The two groups' weight differences range from 0.0324 kg to 1.156 kg, with an average difference of 0.594 kg (Mawaddah & Tiyawati, 2021). Exclusive breastfeeding is the behavior of giving breast milk only to babies until the age of six months without other food and/or drinks. The best food for babies is breast milk in sufficient amounts, which can satisfy their nutritional needs for the first six months of life. A significant, long-lasting, and economical intervention to lower toddler morbidity and death is exclusive breastfeeding. However, most babies are not exclusively breastfed as recommended by the World Health Organization (Nazli & Erlinda, 2020).

4. CONCLUSION

The results of the research that has been done, conclusions are obtained about the effect of supplementary recovery feeding on the weight of undernourished toddlers aged 24-59 months at the Panekan Health Center, namely as follows: The average weight of

undernourished toddlers before toddlers who did not receive was 10.471, and for toddlers who received was 10.540. After recovery food supplementation, the average weight of undernourished toddlers is 10.503 for those who do not receive it and 11.098 for those who do. At the Panekan Health Center, the weight of malnourished toddlers between the ages of 24 and 59 months has an impact. The Panekan Health Center is anticipated to benefit from the research's findings. Education: It is hoped that the results of this study will inform obstetrics teaching materials about nutrition for children under five. If undernourished toddlers do not receive proper care, they will grow into malnourished toddlers, which can impede their development and growth as well as cause death. For researchers: For further research, the result of this study can be utilized as reference material. Moreover, it is hoped that further research will be able to monitor PMT-P which has been provided only for consumption by toddlers or their families, as well as processing methods and can identify other factors that can affect malnutrition in toddlers.

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