



# The Combination of Balanced Nutrition Menu in Controlling Undernutrition in Toddlers Through Supplementary Feeding in Community Health Center Enok, Indragiri Hilir Regency

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<p><b>Track Record Article</b></p> <p>Revised: 14 July 2025 Accepted: 15 March 2026 Published: 31 March 2026</p> <p><b>How to cite:</b> Yenita, R. N., Yanti, R., &amp; Meri, D. (2026). The Combination of Balanced Nutrition Menu in Controlling Undernutrition in Toddlers Through Supplementary Feeding in Community Health Center Enok, Indragiri Hilir Regency. <i>Contagion: Scientific Periodical Journal of Public Health and Coastal Health</i>, 8(1), 594–603.</p>	<p style="text-align: center;"><b>Abstract</b></p> <p><i>Undernutrition among children under five is a serious challenge in achieving Sustainable Development Goals (SDGs) Goal 2. In the working area of UPT Puskesmas Enok, especially Rantau Panjang Village, the prevalence of undernutrition still requires innovative interventions. Supplementary feeding (PMT) based on local food with a balanced nutritional menu is expected to be a sustainable solution compared to manufactured processed products. The purpose of the study was to analyze the effectiveness of providing PMT with a combination of a balanced nutrition menu in increasing the body weight of undernourished toddlers in Rantau Panjang Village. Type of quantitative research with a quasi-experiment one-group pretest-posttest design. The research was conducted in Rantau Panjang Village. The population of this study was all toddlers diagnosed with undernutrition in the work area of Community Health Center Rantau Panjang, 42 toddlers. The sampling technique was purposive sampling, obtaining 7 toddlers with an age range of 12-59 months. The results showed that the average body weight of toddlers before the intervention was 9.77 kg (SD = 2.4) and after the intervention increased to 10.38 kg (SD = 2.5), with an average increase of 0.6 kg. Statistical tests showed a p-value of 0.000 (<math>p &lt; 0.05</math>), which means that there is a significant effect of providing a balanced nutrition menu PMT on toddler weight. Puskesmas are advised to adopt this balanced nutrition menu model as a standard operating procedure in handling underweight children. The Rantau Panjang Village Government is expected to integrate the village fund budget to support the sustainability of this program.</i></p> <p><b>Keywords:</b> <i>Balanced Nutrition Menu, Toddler, Undernutrition, Supplementary Feeding.</i></p>
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## INTRODUCTION

Malnutrition is a global challenge set out in the Sustainable Development Goals (SDGs), specifically Goal 2 (United Nations, 2015). Target 2.2 specifically aims to end all forms of malnutrition by 2030, including stunting and wasting (UNICEF, 2023). Optimal nutritional status during the toddler years is a crucial investment in the quality of human resources, as malnutrition during this period can result in reduced intelligence and productivity and increased risk of degenerative diseases in the future (Walker et al., 2011). If left unaddressed, this condition can lead to lost generation (Siahaya & Rehena, 2021).

According to the United Nations Children's Fund (Unicef, 2023), malnutrition causes almost half of all deaths among children under five. Malnutrition increases the risk of children contracting infections, worsens existing infections, and delays recovery. According to UNICEF, the average prevalence of malnutrition in toddlers is 45%. The target of the National Medium-Term Development Plan (Rencana Jangka Menengah Nasional/RJMN) for 2020–

2024 is to reduce the prevalence of malnutrition to 7%, based on the BB/U index from the 2020 Nutritional Status (Pemantauan Status Gizi/PSG) monitoring results (RJMN, 2020). The national prevalence of malnutrition among toddlers is 7.2%, which exceeds the target of 7% (Kementerian Kesehatan Republik Indonesia, 2021).

The prevalence of malnutrition among toddlers in Indonesia was 4.0% based on the weight-for-height (BB/TB) index. West Papua Province had the highest malnutrition and undernutrition (wasting) rate at 9.6%, while DKI Jakarta Province had the lowest at 1.4%. The prevalence of wasting among toddlers was also obtained from the 2023 SKI at 8.5%. This figure indicates a 0.8% increase in the prevalence of wasting toddlers compared to the 2022 SSGI (Kemenkes, 2024).

Malnutrition in Indonesia is a significant concern. According to the most recent data from SSGI in 2022, the prevalence of malnutrition and undernutrition among children increased compared to 2021, rising from 7.1% to 7.7% (Kemenkes RI, 2023). Based on data from the Coordinating Ministry, as of July 2nd, 2024, the government has set a target of 17.1 million toddlers and has reached 95.15% of that target. A total of 5.8 million toddlers, which equates to 36.10%, have been identified as experiencing nutritional challenges (Kemenko PMK, 2024). The Province of Riau has been identified as being in the high category (>10%) for health problems. From 2019 to 2022, a decline in prevalence was observed, with the rate now classified as moderate (5%-<10%). A comparison of the prevalence of wasting in Riau Province with the national target for 2022 (7.5%) shows that the province has not yet reached it.

The analysis of data collated at integrated health centers through nutritional surveillance initiatives and the utilization of the Electronic Community-Based Nutrition Recording and Reporting (e-PPGBM) application in 2022 within the context of Riau Province reveals that 11.816 toddlers (2.9%) were documented as severely underweight (Dinkes Riau, 2023). Furthermore, 10.188 toddlers (2.5%) exhibited very short and short heights (stunting), while 10.933 toddlers (2.7%) experienced malnutrition and wasting. The coverage weighed in at 66.98%, up from 55% in 2021. Nevertheless, the proportion of toddlers suffering from malnutrition in a number of districts and cities, notably Siak and Bengkalis Regencies, remains relatively high and exceeds the national target. This has led to its categorization as a moderate health problem, as defined by the World Health Organization (WHO, 2018).

The prevalence in 2023 was 2.6% of toddlers in Indragiri Hilir Regency who were undernourished in Q2, rising to 3.1% in Q4. Undernourishment in toddlers remains a major concern. Conversely, the prevalence of undernutrition in toddlers at the Enok Health Center

initially stood at 1.4%, subsequently rising to 2.1% based on the findings of a mass weighing initiative conducted in June 2023. The classification of nutritional status of toddlers (aged 0-60 months) according to the Regulation of the Ministry of Health of the Republic of Indonesia Number 2 of 2020 also demonstrates alterations in the BB/TB indicator, encompassing the category of underweight toddlers (BB/TB) (Kementerian Kesehatan Republik Indonesia, 2020).

One strategy to address malnutrition is the provision of locally sourced supplementary food (Ramadhania et al., 2025). The supplementary food also counsels and recovers malnourished toddlers. To address this issue, the government has implemented a series of strategic measures, including the establishment of comprehensive policies. This policy encompasses the prevention, promotion, education, and management of nutrition in children. One of the government's primary initiatives is the provision of supplementary food (PMT), which incorporates a combination menu for toddlers aged 6-59 months. The determination of this menu is based on body weight (BB) measurements, with BB determined from body length (PB) or height (TB) that are below minus two standard deviations (Sarni et al., 2022).

The importance of a combination menu in supplementary feeding (PMT) stems from the principle of nutritional synergy and the biological needs of toddlers that cannot be met by a single food source. Combination menus that combine macronutrients (carbohydrates, fats, and proteins) and micronutrients (vitamins and minerals) are crucial because some nutrients require “partners” to be optimally absorbed by the body (Almatsier, 2011). For example, the presence of healthy fats in fish or eggs is necessary to solubilize vitamins A, D, E, and K, while vitamin C from local vegetables plays an important role in enhancing the absorption of non-heme iron (Harrison & May, 2010). Without a balanced combination, essential micronutrients administered are often not fully absorbed and are lost through the excretory system, resulting in slow recovery of nutritional status.

In addition, the importance of combination diets in supplementary feeding (PMT) stems from the greater bioavailability of essential amino acids in animal proteins compared with plant proteins (Eadey et al., 2018). In the rapid growth phase, toddlers require a complete amino acid profile for protein synthesis and growth hormone stimulation. The use of a varied menu that combines cork fish, catfish, chicken, and eggs provides the advantage of higher protein absorption to repair cell damage due to malnutrition (Schoenfeld & Aragon, 2022). On the other hand, menu variety plays an important role in preventing food boredom among toddlers, who often experience decreased appetite due to recurrent infections (Bilman et al., 2017).

The government's current supplementary feeding program (Pemberian Makanan Tambahan/PMT) primarily utilizes processed foods, including specifically formulated biscuits. However, in 2022, an initiative was undertaken to transition PMT program activities from manufactured products to the utilization of local food ingredients. The PMT program, which incorporates a menu of locally sourced ingredients, is a pivotal element in the broader efforts to prevent stunting. While this program provides many benefits for the community, such as toddlers getting fresh, nutritious food without factory processing or preservatives, it also revives the local community's economy by procuring PMT raw materials from local farmers and fishermen. So that this program can create an ecosystem of mutual assistance among citizens to alleviate malnutrition. Based on the above background, the purpose of this study was to analyze the effectiveness of supplementary feeding (PMT) with a combination of a balanced nutrition menu on increasing the weight of underweight toddlers in the working area of UPT Puskesmas Enok.

## METHODS

The method used in this research is quasi-experimental with the one-group pretest-posttest design model, which focuses on controlling the nutritional status of under-fives through supplementary feeding combined with a balanced nutrition menu in Rantau Panjang Village, under the auspices of Community Health Center Enok.

The population in this study comprised all toddlers diagnosed with malnutrition in the working area of UPT Puskesmas Rantau Panjang, totalling 42. Samples were taken using a purposive sampling technique with inclusion criteria: undernourished toddlers aged 12-59 months residing in Rantau Panjang Village and parents willing to participate, resulting in a sample of 7 toddlers. The research instruments used include 24-hour food recall, which aims to assess respondents' food consumption habits; child anthropometric measurement forms; and calibrated digital weight scales, in accordance with the Ministry of Health Anthropometry Kit standards and stationery.

The PMT intervention was carried out daily for 4 weeks, with a varied menu adjusted to the nutritional needs of toddlers. Researchers collaborated with Enok Health Center nutritionists and Posyandu cadres. The PMT menu varies every day. The PMT menu provided during the study period was *Sempol Udang Rota*, *Bola Kentang Isi Tahu*, *Bakwan Tahu Ikan Gabus*, *Rolde Tempe*, and *Lele Cincang Koreng Panir*.

The analysis was conducted using the SPSS program, which employs univariate and bivariate analysis techniques. Univariate analysis was used to see the frequency distribution of

toddler age and average body weight before and after the intervention. Bivariate analysis used the paired sample t-test because the data were normally distributed. The paired T-test aims to identify whether there is an effect of supplementary feeding based on local food on increasing body weight in underweight toddlers. The confidence level used in all these tests is 95%, or  $\alpha = 5\%$  (0.05).

## RESULTS

### Descriptive analysis

An overview of the respondents' characteristics and the frequency distribution of children's nutritional status under five years of age before and after receiving a balanced nutrition combination PMT is presented in the univariate analysis. The data are summarized systematically in Table 1 below:

**Table 1. Descriptive Analysis**

Variable	Frequency (f)	Percentage (%)
<b>Age</b>		
12-24 months	4	57%
25-59 months	3	43%
<b>Nutritional Status (before)</b>		
Good Nutrition	0	0%
Undernutrition	7	100%
<b>Nutritional Status (after)</b>		
Good Nutrition	5	71.4%
Undernutrition	2	28.6%

Based on Table 1, the respondents in this study were mostly aged 12-24 months, accounting for 57%. Before being given PMT with a balanced nutrition menu, 7 toddlers (100%) had a nutritional status of less, with SD values (-3 SD) (<-2SD). After being given PMT with a balanced nutrition menu, most of the 5 toddlers (71.4%) showed improvements in nutritional status, with SD values ranging from (-2SD) to (-1 SD).

### Bivariate Analysis

Research on controlling malnutrition in toddlers through PMT and balanced nutritional menus in Rantau Panjang Village, UPT Puskesmas Enok, Indragiri Hilir Regency, yielded the following results:

**Table 2. The Efficacy of a PMT Program in Addressing Malnutrition among Toddlers Through the Provision of Balanced Nutritional Menus in Rantau Panjang Village, UPT Puskesmas Enok, Indragiri Hilir Regency**

Variable	Intervention	Mean	SD (Min-Max)	P value
Toddlers' weight	Before	9.77	2.4 (6.6-12.4)	0.000
	After	10.38	2.5(7.1-13.1)	
	Difference	0.6		

Based on Table 2 above, the average body weight of toddlers before the intervention was 9.77 kg and increased to 10.38 kg after receiving PMT with a balanced nutrition menu. The statistical test results show a p-value of 0.000 ( $p < 0.05$ ), indicating a significant effect of PMT provision on increasing body weight in undernourished children in Rantau Panjang Village. The average weight gain of toddlers during the intervention period was 0.6 kg.

## DISCUSSION

The results showed that providing PMT in combination with balanced nutrition menus significantly increased the body weight of undernourished children in Rantau Panjang Village. The average increase of 0.6 kg, with a p-value of 0.000, indicates that this intervention is statistically significant.

This increase occurs because the menu provided not only pursues calorie targets but also balances macronutrients (carbohydrates, protein, fat) and micronutrients. During the growth phase of toddlers, animal protein intake is crucial for repairing body cells and stimulating growth hormone (GH) (Putri & Mahmudiono, 2020). The results of this study are in line with research by Nugraha (2012), which showed that supplementary feeding can improve BB/U z-scores in toddlers experiencing malnutrition by 47.9%. Providing additional food rich in animal and vegetable protein to undernourished toddlers has the potential to further improve their nutritional status.

Changes in the nutritional status of toddlers can be caused by compliance with PMT consumption and balanced nutrition menus. In this study, after providing PMT with a balanced nutrition menu for 4 weeks, most malnourished toddlers (5 out of 7) showed improvement in nutritional status, with SDs ranging from -2 SD to -1 SD. This study is in line with a study conducted by Murtining et al. (2020), which showed that supplementary feeding (PMT) for undernourished toddlers had a positive impact on changes in their nutritional status because the PMT balanced nutrition menu has the advantage of increasing albumin levels and body weight compared to standard biscuit PMT due to higher fresh animal protein content. This is also supported by the findings of Irwan et al. (2020), who reported that PMT was highly effective in improving the nutritional status of undernourished toddlers.

A varied menu prevents food boredom in toddlers. The use of local ingredients such as gabus fish, catfish, chicken, and eggs (common in the Indragiri Hilir region) provides albumin and essential amino acids that are readily absorbed by toddlers with nutritional disorders (Mustafa et al., 2012). In addition, the increase in body weight by 0.6 kg also indicates a change in behavior in mothers of toddlers. With the balanced nutrition PMT program, mothers of

toddlers in Rantau Panjang Village indirectly learn about proper food processing. Environmental support in the UPT Puskesmas Enok work area also helped the process of this study, both through cadre monitoring and through motivation from health workers and nutritionists, which served as a supporting factor in ensuring that the PMT intervention was properly consumed by toddlers.

The results of this study are also clinically evident, with an increase in average body weight from 9.77 kg to 10.38 kg, shifting the Z-score position of toddlers away from the threshold for undernutrition (wasting) (-3 SD). This is crucial in long-term efforts to reduce stunting in Indragiri Hilir District (Schoenbuchner et al., 2019). Improved nutritional status will strengthen children under-five's immune systems, reducing the likelihood of illness and preventing worsening of their nutritional condition (malnutrition-infection cycle). In addition, malnutrition in under-fives, if not immediately addressed, can develop into malnutrition. The impact of malnutrition is not limited to physical disorders; it also affects intelligence and productivity in adulthood. This is because the under-fives are in a critical developmental period (Nasrul et al., 2015).

Given that this study used a one-group pretest-posttest design without a control group, the researcher recognizes the influence of external variables such as children's diet at home or subclinical infection factors that cannot be fully controlled. In addition, the small sample size ( $n=7$ ) limits the generalizability of the results; therefore, the results of this study should be interpreted with caution, and further research is recommended with a larger sample and tighter control of clinical variables. However, the high significance of the results indicates that the balanced nutrition PMT intervention remains the dominant factor in weight change in toddlers.

This study has important practical implications: it can serve as an effective strategy for improving the nutritional status of undernourished toddlers; as a reference for developing more varied, nutritious, and locally appropriate PMT menus; and as a concrete guide for serving nutritionally balanced meals at home. In terms of policy implications, local health departments, particularly in Indragiri Hilir Regency, can use these findings to develop nutrition intervention programs based on local foods and to encourage more targeted budget allocation to address undernutrition in infants and toddlers. The theoretical implications are that this study reinforces the concept of balanced nutrition as an effective approach in nutrition interventions for infants and toddlers and serves as a scientific reference regarding the effectiveness of varied menus compared to the provision of monotonous supplementary foods. However, this study also has limitations, particularly regarding sample size, the relatively short duration of the intervention—which prevents optimal observation of long-term changes in nutritional status—

and the lack of control for external variables, as this study did not include a control group. Therefore, the findings need to be further developed through follow-up research with a broader scope and more comprehensive methods.

## CONCLUSIONS

Based on the results of the analysis and discussion, it can be concluded that the intervention of providing PMT with a combination of a balanced nutrition menu based on local food is significantly able to increase the body weight of undernourished children in Rantau Panjang Village, the working area of Community Health Center Enok. Statistically, there was an average weight gain of 0.6 kg with a very strong level of confidence ( $p=0.000$ ), which proves that the utilization of local animal and vegetable proteins is much more effective than simply providing standard supplementary food. This increase not only indicates a quantitative improvement in nutrient intake but also reflects toddlers' greater acceptance of fresh menu variations compared to processed manufactured products.

However, the study also revealed that single feeding is not necessarily a comprehensive solution for every individual. It was found that 28.6% of the total subjects remained malnourished post-intervention, indicating the influence of other determinants such as co-infectious diseases or limited access to environmental health. Therefore, the success of nutrition interventions at the village level depends on a combination of diet quality and personalized medical supervision. At a macro level, the results of this study support the achievement of SDGs Goal 2 in alleviating malnutrition at the regional level through empowering the local potential of Indragiri Hilir District.

Based on these findings, it is recommended to Community Health Center Enok to adopt this balanced nutrition menu model as a standard operating procedure in handling underweight children in other working areas, while still providing special attention through clinical screening (such as TB or helminthiasis testing) for children under five who do not show an adequate weight response. The Rantau Panjang Village Government is expected to integrate the village fund budget to support the sustainability of the provision of quality local food at Posyandu so that village food independence can be realized.

For parents of toddlers, it is recommended to increase creativity in processing local food ingredients at home so that toddlers do not experience boredom while eating and continue to maintain environmental sanitation and hygiene as a preventive measure against infection. Finally, for future researchers, it is strongly recommended to develop a study with a wider sample scale and longer duration of intervention and include a control group to strengthen the

validity of the findings so that the results of the study can be generalized more broadly for public health policy at the district level.

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