



SIGNIFICANCE OF THE LOCAL-BASED PMT INTERVENTION IN ADDRESSING UNDERWEIGHT ON TODDLERS AGED 12-48 YEARS

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ABSTRACT

One of the health indicators assessed in the Sustainable Development Goals in Indonesia is the nutritional status of children under five. Based on the results of the Indonesian Nutrition Status Study in 2022, the prevalence of dietary problems at the East Kalimantan provincial level has increased, stunted 22.8% increased to 23.9%, wasting 8.1% increased to 9.1%, and underweight 16.2% increased to 20.4 %. While Samarinda City, according to SSGI 2021 and 2022 data, Stunted 21.6% in 2021, increased in 2022 to 25.3%, Wasting 6.1% increased to 9.3%, and Underweight 13.9% to 20.7%. Harapan Baru health centre in 2022-2023 stunted 12.7% in 2022, increased in 2023 to 19.0%, wasting increased from 6.8% to 7.6%, and underweight increased from 16.9% to 18.7%. One of the government's efforts in Samarinda City, especially in the Harapan Baru Health Center working area, to overcome the problem of malnutrition is through the Local Supplementary Feeding program. This activity took place in the May-June period of 2024. The local supplementary feeding program targets underweight toddlers aged 12-48 months; as many as 75 toddlers are selected purposively and spread across two sub-districts. The local PMT procurement budget is sourced from the Special Allocation Fund budget for Puskesmas Health Operational Assistance in 2024. This study was designed with the specific aim of analyzing the results of implementing the local PMT program on the weight of underweight children. The analysis used was a two-sample paired non-parametric statistical test with the Wilcoxon test. Based on the Wilcoxon test shows that the weight before and after giving PMT was 28 days and 56 days sig. (2-tails = 0.00 < 0.05, meaning there is a significant difference in toddler weight between before and after being given local PMT.

Keywords: PMT local; nutritional status; underweight

1. INTRODUCTION

Good nutritional status is one of the determining factors for the success of human resource development. Pregnant women and toddlers are one of the groups vulnerable to

nutrition that need special attention because of the long-term impacts caused by malnutrition. In addition, toddler age is a period of rapid growth and development and is prone to malnutrition. Likewise with pregnant women, if pregnant women experience malnutrition, it will affect the growth and development of the fetus, which is at risk of giving birth to babies with low birth weight (LBW) and/or stunting (Ministry of Health. 2023).

Malnutrition in children is a significant cause of child mortality, disease, and disability. For example, very short children face a four times higher risk of death, and fragile children have a nine times higher risk of death. Micronutrient deficiencies such as vitamin A, iron, or zinc also increase the risk of death. The urgency of this issue cannot be overstated. Malnutrition can cause various diseases, such as blindness due to vitamin A deficiency and neural tube defects due to folate deficiency (Unicef, 2013).

Global Scale of Malnutrition Among Infants and Children Under Five Malnutrition remains a significant global problem for infants and children under five (toddlers). World Health Organization (WHO) data in 2020 showed that 5.7% of toddlers in the world experienced overnutrition, 6.7% experienced undernutrition and severe malnutrition, and 22.2% or 149.2 million suffered from stunting (chronic malnutrition).

The problem of toddler nutrition in Indonesia is still relatively high. The results of the 2018 Riskesdas showed that the prevalence of *wasting toddlers* was 10.2 %, and underweight toddlers were 17.7%. Based on the 2021 SSGI, the prevalence of *stunting* in 2019-2021 decreased from 27.7% to 24.4%, *wasting* from 7.4% to 7.1%, and underweight from 16.3% increased to 17.0%. The results of the 2022 SSGI were stunting decreased to 21.6%, wasting increased from 7.1 to 7.7%, and underweight increased to 17.1%.

Based on the results of SSGI 2021 and SSGI 2022, the prevalence of nutritional problems at the East Kalimantan provincial level has increased, stunted 22.8% increased to 23.9%, wasting 8.1% increased to 9.1%, and underweight 16.2% increased to 20.4%. While Samarinda City, according to SSGI 2021 and 2022 data, Stunted 21.6% in 2021, increased in 2022 to 25.3%, Wasting 6.1% increased to 9.3%, and Underweight 13.9% to 20.7%. At Harapan Baru Health Center, which is a health facility in Samarinda City, based on data taken from e-PPGBM (Community-Based Nutrition Recording and Reporting Application) data in 2022-2023, stunted 12.7% in 2022, increasing in 2023 to 19.0%, wasting increased from 6.8% to 7.6%, and underweight also increased from 16.9% to 18.7%.

Various factors cause nutritional problems. Lack of nutritious food intake and/or frequent infection with disease is one of the direct causes of nutritional problems. Inappropriate parenting patterns, lack of knowledge, difficulty accessing health services, and socio-economic conditions indirectly influence access to nutritious food and health services.

Based on the 2014 Total Diet Survey (SDT) data, there are still 48.9 % of toddlers who have an energy intake that is less than the recommended Energy Adequacy Intake (70%-<100% AKE) and 6.8% of toddlers who have very low energy intake (<70% AKE). In addition, 23.6 % of toddlers have a protein intake that is less than the recommended Protein Adequacy Intake (<80% AKP). In addition to the lack of energy and protein intake,

the types of food given to toddlers are also less diverse. Based on the 2021 SSGI, the proportion of diverse food intake in toddlers is 52.5 %. Infections in toddlers are also relatively high. Namely, the proportion of toddlers experiencing diarrhoea is 9.8 %, and ARI is 24.1% (SSGI 2021).

Providing additional food (PMT) is part of a specific nutritional intervention. PMT is part of an effort to improve the nutritional status and health of the community, especially in vulnerable groups such as toddlers, school children, pregnant women, and stunting sufferers. PMT can be carried out in various forms, depending on the needs and conditions of the existing priority targets. The selection of the form of PMT must consider nutritional needs, availability of food ingredients, and the ability of the mother or family to process the food. PMT's objectives include: 1. Increasing adequate and balanced nutritional intake, especially the important nutritional content needed by the body. 2. Preventing and overcoming nutritional problems such as malnutrition, chronic energy deficiency (CED), and stunting. 3. Increasing endurance and the quality of human resources in the future. Reviewing the various objectives of PMT, this study discusses the effectiveness of the toddler PMT program in the last three years to accelerate the reduction in the number of nutritional problems in Indonesia (Wenny Rahmawati et al., 2023).

2. METHODS

This study is an intervention study using *a quasi-experimental and one-group pretest Posttest design* to see the changes that occur after treatment. The approach used was a pretest and posttest one group design, which used one group of subjects (toddlers aged 12-48 months) and did not use a control. All toddlers who were selected samples were given the same treatment, namely PMT. Anthropometric measurements of toddlers were taken as initial data using a digital foot scale with an accuracy of 0.01 kg. Then, anthropometric measurements were taken after giving Local PMT on the 28th and 56th days.

The population of this research sample was underweight toddlers aged 12-48 months in Samarinda City, Working Area of Harapan Baru Health Center UPT. The selection of research samples was based on inclusion criteria and exclusion criteria. The inclusion criteria are underweight toddlers (underweight and very underweight) with the indicator Body Weight for Age (BB/U). Meanwhile, the exclusion criteria are toddlers who have disorders such as congenital disabilities and pulmonary TB.

The number of toddlers weighed at each Posyandu was 572 toddlers. Toddlers with Normal Body Weight (BB/U) were excluded from the sample, which was 425 toddlers; overweight and at risk were 34 toddlers, and toddlers with poor nutritional status (BB/TB) were excluded from the sample, which was three toddlers, 15 toddlers were diagnosed as suspected TTC children, and 20 toddlers among them had difficulty committing to participate in PMT activities because the distance from their homes was far, they did not have vehicles and so on so that the number of research samples was 75. Underweight toddlers who received Local PMT. This activity was carried out in two sub-districts, namely, Harapan Baru and Rapak Dalam, starting from 08.30 - 12.00 WITA PMT processing time

and 12.30-15.00 PMT distribution time to the target, for 56 consecutive days, where Sundays/holidays still run.

Data analysis used paired sample statistical tests with *Wilcoxon* (because the data was not normally distributed), which is one of the testing methods used to assess the effectiveness of treatment, indicated by the difference in the average after treatment was given. This study seeks to see the difference between average and toddler weights before and after the PMT program was implemented. PMT was provided in June 2023, and the funds used were from the Special Allocation Fund (DAK) Health Operational Assistance (BOK) Health Center Budget.

Table 1. Menu Cycle: an example of a local PMT menu

No.	Menu	Calories	Protein	Fat	KH
1	Rice Fried Chicken Fillet Braised Eggs TempehBacem Clear Vegetable Soup Watermelon	535	34	19.3	56.4
2	Vegetable Nuggets	266	17.3	11.2	24.5
3	Rice Stir-fried liver + meatballs Corn fritters Stir-fried Carrots + Green Beans Banana	470.5	24.3	11.6	68.8
4	Cheerful Noodle Omelette	254.3	18.4	13	15.8
5	Rice Fried Chicken Flour Tofu Perkadel Clear Tofu Clear Moringa leaves Watermelon	401.6	22.7	12.7	49.3
6	Roll Stick	325.3	16.4	7.4	47
7	Rice Patin with Palumara Seasoning Braised Tempeh Corn + Spinach Soup Pawpaw	432	24.1	7.9	69.9
8	Rice Fried Fish Fillet with Flour Stir-fried long beans with tempeh Orange	361	22.8	5.5	56.1
9	Chicken Tofu Balls	253	16.4	9.3	26.7
10	Rice Fish Soy Sauce	399	24	6	64.9

Katuk leaf clear
Banana

The local PMT is prepared by Micro, Small and Medium Enterprises (MSMEs) in each Sub-district concerning the recommended menu guidelines from the Samarinda City Health Office, then will be delivered by the posyandu cadres in each posyandu directly to the target. PMT is provided in the form of ready-to-eat food or snacks, rich in animal protein sources with a 10-day.

3. RESULTS AND DISCUSSION

The target toddlers for local PMT were 75 toddlers aged 12-48 months with gender and age characteristics as presented in Table 2.

Table 2. The toddlers characteristics for local PMT

Variables	n	%
Gender		
Man	48	64
Woman	27	36
Total	75	100
Age		
1 year-1 year 11 months	38	50.7
2 years - 4 years	37	49.3
Total	75	100

Based on Table 2. The number of toddlers with the male gender is 48 toddlers (64%), while the female is 27 (36%). Toddlers aged 1 year-1 year 11 months are 38 toddlers (50.7%), and aged 2-4 years are 37 toddlers (49.3%).

Table 3. Distribution of BB changes before and after PMT is given

Variables	28 Days after PMT Administration		56 days after PMT administration	
	n	%	n	%
Go on	26	34.7	40	53.3
Not Up	47	62.7	28	37.3
Down	2	2.6	7	9.4
Total	75	100	75	100

Table 3 shows that the increase in weight after 28 days of PMT was 26 toddlers (34.7%), and on the 58th day of PMT, the weight of toddlers who increased was 40 toddlers (53.3%), while those who decreased weight after giving 28 days were two toddlers (2.6%), after 56 days of PMT seven toddlers did not gain weight. This was because some toddlers were bored with the menu provided (did not finish it), had a fever, cough, runny nose, and some had a toothache, so the PMT given was not finished.

Table 4 shows that the change in the BB/U category before PMT provision was 54 toddlers (72%); after 28 days of PMT provision, it decreased to 43 toddlers (57.3%), and on the 56th day, it increased to 52 toddlers on the underweight category (69.3 %). The very underweight category before PMT provision was 21 (28%), increasing to 22 toddlers (29.3%) after 28 days of PMT provision and decreasing to 11 toddlers (14.7%) on the 56th day of PMT provision. The sound category before PMT provision was zero toddlers (0%), increasing to 10 toddlers (13.3%) after 28 days of PMT provision and increasing to 12 toddlers (16.0%) on the 56th day of PMT provision.

Table 4. Changes in BB/U Categories before and after PMT provision

Variables	BB/U Initial		BB/U Category 28 days		BB/U Category 56 days	
	n	%	n	%	n	%
Not enough	54	72	43	57.3	52	69.3
Very less	21	28	22	29.3	11	14.7
Good	0	0	10	13.3	12	16.0
Total	75	100	75	100	75	100

To find out whether there was a difference in initial BB (before administering local PMT), after administering PMT for 28 days, and after 56days, a normality test was first carried out; the results were not normally distributed (sig.(2-tails) <0.05), the results of the normality test can be seen in table 5 below.

Table 5. Normality Test, BB before, BB 1 (28 days of PMT administration), BB 2 (56 days of PMT administration)

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
BB_SEB	.102	75	.053	.964	75	.033
BB_SES1	.115	75	.016	.965	75	.035
BB_SES2	.103	75	.049	.966	75	.042

After conducting a normality test, the results showed that the data was not normally distributed, so Wilcoxon was used. The results are as follows.

Table 6. Wilcoxon Test Statistics

	BB_SES1 - BB_SEB	BB_SES2 - BB_SES1
Z	-4.709^b	-4.899^b
Asymp. Sig. (2-tailed)	.000	.000

a. Wilcoxon Signed Ranks Test
 b. Based on negative ranks.

The table above shows BB before and after giving PMT for 28 days and 56 days, sig value. (2-tails = $0.00 < 0.05$, meaning there is a significant difference in toddler weight between before and after being given local PMT.

The results of this study are following the objectives of providing additional food, namely to increase energy and essential nutrients, as well as the objectives of providing additional food (PMT) for recovery in malnourished/undernourished infants and toddlers, including providing high-energy, high-protein, and sufficient vitamin and mineral foods gradually, in order to achieve optimal nutritional status, which states that there is a change in body weight before and after providing local PMT to toddlers.

This is in line with research conducted by Wenny Rahmawati et al. 2023 using a literature review stating that, in general, the study's results prove that providing additional food (PMT) has been proven to be significant in overcoming various nutritional problems in Indonesia. Adequate nutrition is essential to ensure that children grow up healthy, have organs that function correctly, form a strong immune system, and develop the nervous and cognitive systems.

The results of this study are also by those conducted by Putri Sarah, 2022 regarding the effect of providing Local PMT on improving nutritional status in malnourished toddlers in the intervention group and the control group, and there was an increase in body weight from the mean pretest result of 7,475 kg to 7,875 kg. The sig value was obtained in the independent sample t-test in the table above. (2-tails) of $0.032 < \alpha (0.05)$. This means that there is an effect of providing Local PMT on improving nutritional status in malnourished toddlers.

The results of this study are also by the results of the study by Irwan, Mery T, Sunarto Kadir, and Lia Amalia in 2020 regarding the effectiveness of providing Modified PMT based on local wisdom on improving the nutritional status of undernourished and stunted toddlers, which stated that Modified PMT is efficacious in improving the nutritional status of undernourished toddlers, but more effective Modified PMT based on local wisdom on improving the nutritional status of undernourished toddlers in the work area of the Paguyaman Health Center, Boalemo Regency. This is proven by the paired sample t-test in the modified group, t count = 19.858 and $p = 0.000$ was obtained and in Modified PMT, t count = 14.967 and $p = 0.000$, so the p-value < 0.05).

According to researchers, the implementation of local PMT provision can have a significant impact on increasing toddler weight in Samarinda City. Therefore, this program can be continued by considering the implementation time up to 56 days and 90 days of local PMT provision.

4. CONCLUSION

Based on the results of statistical tests, the program of providing local PMT to toddlers for 56 days concluded that there was a difference in weight before and after providing local PMT as one of the interventions for nutritional problems, and this program can be maintained and implemented sustainably.

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Authors contributions

DSD and HB conceptualized the research, DSD and HB designed the research and analyzed the research results, and BH wrote the manuscript text, prepared the tables and collected the data. All authors reviewed the manuscript.

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