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Effect of Local Food–Based Supplementary Feeding on Body Weight among Toddlers in the Catchment Area of Marusu Primary Health Center

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ABSTRACT/ ABSTRAK

ABSTRACT. *Underweight is defined as low body weight resulting from undernutrition and reflects the failure of infants and toddlers to achieve ideal body weight. The occurrence of underweight among toddlers is primarily caused by inadequate nutrient intake, which is largely associated with households' inability to provide sufficient food for all family members, limited access to food, poor dietary patterns including food taboos, and low household income. This study aimed to determine the effect of local food–based supplementary feeding on body weight among underweight toddlers at the Marusu Primary Health Center. This study employed an analytic observational design with a cross-sectional approach and was conducted in July 2025 using secondary data. A total of 58 underweight toddlers were included through total sampling, and the data were analyzed using the Wilcoxon Signed Rank Test. Prior to the intervention, all toddlers were classified as underweight. Following the provision of local food–based supplementary feeding, 17 toddlers (29.3%) showed an improvement in nutritional status and achieved normal body weight. Statistical analysis indicated a significant effect of supplementary feeding on the nutritional status of underweight toddlers (p-value < 0.05). In conclusion, local food–based supplementary feeding was proven to be effective in increasing toddlers' body weight and improving mothers' knowledge regarding the importance of adequate nutrition for children's growth and development.*

Kata kunci:

Balita, Berat Badan Kurang, Makanan Tambahan Lokal, Peningkatan Berat Badan

ABSTRAK. *Underweight* diartikan sebagai berat badan rendah akibat kekurangan gizi dan merupakan kondisi kegagalan bayi dan balita dalam mencapai berat badan ideal. Kejadian *underweight* pada balita terutama disebabkan oleh kurangnya asupan zat gizi, yang umumnya berkaitan dengan ketidakmampuan rumah tangga dalam menyediakan pangan yang cukup bagi seluruh anggota keluarga, keterbatasan akses pangan, pola makan yang buruk termasuk adanya tabu makanan, serta rendahnya pendapatan rumah tangga. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian Makanan Tambahan (PMT) lokal terhadap berat badan pada balita dengan berat badan kurang di Puskesmas Marusu. Penelitian ini menggunakan desain analitik observasional dengan pendekatan *cross sectional* dan dilaksanakan pada bulan Juli 2025 dengan menggunakan data sekunder. Sampel penelitian berjumlah 58 balita dengan status berat badan kurang yang diambil menggunakan teknik total sampling, dan data dianalisis menggunakan uji *Wilcoxon Signed Rank Test*. Hasil penelitian menunjukkan bahwa sebelum intervensi seluruh balita berstatus berat badan kurang, dan setelah pemberian PMT lokal terdapat peningkatan status gizi pada 17 balita (29,3%) yang mencapai kategori berat badan normal. Hasil analisis statistik menunjukkan bahwa pemberian PMT lokal berpengaruh signifikan terhadap status gizi balita dengan berat badan kurang (p-value < 0,05). Dengan demikian, dapat disimpulkan bahwa pemberian PMT lokal efektif dalam meningkatkan berat badan balita serta meningkatkan pengetahuan ibu mengenai pentingnya kecukupan gizi untuk menunjang pertumbuhan dan perkembangan anak.

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INTRODUCTION

Toddlers are the group most vulnerable to nutritional problems, particularly undernutrition, which can lead to conditions such as weight loss, growth disorders, and nutrient deficiencies. Undernutrition not only affects physical health but also influences children's cognitive abilities and intelligence, ultimately reducing their productivity. Previous studies have shown that undernutrition can impair children's physical and mental development and hinder academic achievement. Consequently, toddlers are classified as one of the most nutritionally vulnerable population groups and therefore require special attention (Devianti et al., 2019).

Underweight is one of the major public health problems that, if not properly addressed, may adversely affect the quality of human resources in Indonesia. One of the anthropometric parameters used to assess nutritional status is the weight-for-age (WFA) index, which reflects a child's body weight relative to age. This index is commonly used to identify children classified as underweight (−3 SD to < −2 SD) or severely underweight (< −3 SD) (Budiana & Supriadi, 2021).

Underweight is defined as low body weight resulting from undernutrition and reflects the failure of infants and toddlers to achieve ideal body weight. It serves as an important indicator of children's nutritional status. Underweight conditions pose serious health risks, including increased vulnerability to malnutrition, hunger, and disease-related complications. Toddlers with underweight status tend to have weakened immune systems, impaired growth and development, and a higher risk of infectious diseases. Nutritional problems are multifactorial in nature; therefore, their management cannot rely solely on medical approaches or health services (Kumala et al., 2023).

The primary cause of underweight among toddlers is inadequate nutrient intake. Low dietary intake is mainly associated with households' inability to provide sufficient food for all family members, limited access to food, poor dietary patterns including food taboos, and low household income (Novfrida et al., 2022).

According to the 2018 Basic Health Research (Riskesdas), the prevalence of underweight in Indonesia was 17.7 percent (Kemenkes RI, 2018). Data from the 2021 Indonesian Nutritional Status Survey (SSGI) showed a decline in underweight prevalence to 17.1 percent (Kemenkes RI, 2021), followed by a further decrease to 15.9 percent based on the 2023 Indonesian Health Survey (SKI) (Kemenkes RI, 2023). However, the most recent SSGI data in 2024 indicated an increase in underweight prevalence to 16.8 percent (Kemenkes RI, 2024).

Specifically, in South Sulawesi Province, nutritional problems among toddlers remain a serious concern. Based on SSGI 2022 data, the prevalence of wasting reached 8.3 percent, stunting 27.2 percent, and underweight 17.1 percent. These figures indicate that nearly one-third of toddlers in this region experience growth impairment and undernutrition. The situation is more severe in Maros Regency, where the prevalence of stunting reached 30.1 percent, wasting 13.6 percent, and underweight 25.3 percent. These data demonstrate that Maros Regency bears a substantial nutritional burden at the provincial level.

One of the strategic efforts to address nutritional problems among toddlers is through specific interventions such as local food–based supplementary feeding. The implementation

of this intervention should be accompanied by efforts to improve knowledge and provide nutrition and health education to promote behavioral change among target groups. Educational materials may include the importance of breastfeeding, counseling on infant and young child feeding practices, and the promotion of proper hygiene and sanitation practices within households (Purbaningsih and Ahmad Syafiq, 2023).

Supplementary feeding is defined as the provision of additional food to undernourished toddlers in the form of safe and high-quality snacks, with careful attention to food quality and safety, and nutritional content that meets children's needs. The food provided prioritizes sources of animal and plant-based protein, as well as vitamins and minerals, particularly those derived from vegetables and fruits (Nelista and Fembi, 2021). Therefore, considering the recent increase in underweight prevalence, this study was conducted to examine whether local food–based supplementary feeding affects the occurrence of underweight among toddlers in the catchment area of the Marusu Primary Health Center.

RESEARCH METHOD

This study employed an analytic observational design with a cross-sectional approach, aimed at examining the relationship between independent and dependent variables measured simultaneously at a single point in time. The study was conducted to assess the effect of local food–based supplementary feeding on body weight among underweight toddlers at the Marusu Primary Health Center in 2024. Data collection was carried out in July 2025 using secondary data obtained from reports of underweight toddlers at the Marusu Primary Health Center.

The study population consisted of toddlers residing in the catchment area of the Marusu Primary Health Center who were classified as underweight, with a total sample of 58 toddlers. Sample selection was based on the following criteria. The inclusion criteria were toddlers classified as underweight with a weight-for-age Z-score between −3 SD and < −2 SD and toddlers who received supplementary feeding for 28 days. The exclusion criteria included toddlers with incomplete medical records or incomplete reports of supplementary feeding provision.

Univariate analysis was conducted to describe the frequency distribution and percentage of study variables, including sex, age of toddlers, and body weight before receiving local food–based supplementary feeding. Bivariate analysis was performed to assess changes in body weight after the provision of local food–based supplementary feeding. Data were analyzed using the Wilcoxon Signed Rank Test. This study received ethical approval with reference number 1495/M/KEPK-PTKMS/VII/2025.

RESULTS

Table 1. Frequency Distribution of Toddlers by Sex

Sex	n	%
Female	30	51.7
Male	28	48.3
Total	58	100

***Source**: Primary Data, 2025*

Based on Table 1, of the 58 respondents, the majority were female, comprising 30 toddlers (51.7%), while 28 toddlers (48.3%) were male.

Table 2. Frequency Distribution of Toddlers by Age

Age (months)	n	%
12–23	23	39.7
24–35	19	32.8
36–47	7	12.1
48–58	9	15.5
Total	58	100

***Source:** Primary Data, 2025*

Table 2 shows that among the 58 respondents, 23 toddlers (39.7%) were aged 12–23 months, 19 toddlers (32.8%) were aged 24–35 months, 7 toddlers (12.1%) were aged 36–47 months, and 9 toddlers (15.5%) were aged 48–58 months.

Table 3. Changes in Body Weight among Underweight Toddlers after Local Food–Based Supplementary Feeding

Nutritional Status	n	%
Underweight	41	70.7
Normal body weight	17	29.3
Total	58	100

***Source**: Primary Data, 2025*

Based on Table 3, 17 toddlers (29.3%) experienced an improvement in nutritional status and achieved normal body weight. Among these, 10 were female and 7 were male. Meanwhile, 41 toddlers (70.7%) remained underweight, consisting of 20 females and 21 males.

Table 4. Effect of Local Food–Based Supplementary Feeding on Body Weight

Nutritional Status	n	%	p-value
Underweight	41	70.7	
Normal body weight	17	29.3	0.000
Total	58	100	

***Source**: Primary Data, 2025*

Based on the data presented in Table 4, most toddlers who received local food–based supplementary feeding for four weeks remained in the underweight category, with 41 toddlers (70.7%). Although this group demonstrated an increase in body weight, the gain was not sufficient to shift their nutritional status to the normal category. Conversely, 17 toddlers (29.3%) showed a significant improvement in nutritional status, with body weight increasing to the normal category.

These findings indicate that local food–based supplementary feeding had a positive effect on toddlers' body weight. However, additional supplementary feeding may be required to achieve a more uniform improvement in nutritional status across the entire target group. Furthermore, the Wilcoxon Signed Rank Test yielded a p-value of less than 0.05, indicating a statistically significant effect of local food–based supplementary feeding on body weight among underweight toddlers at the Marusu Primary Health Center in 2024.

DISCUSSION

The results of this study showed that all 58 toddlers were classified as underweight prior to the provision of supplementary feeding. In accordance with the study design, local food–based supplementary feeding was administered exclusively to toddlers with underweight nutritional status, defined by a weight-for-age Z-score between −3 SD and < −2 SD. These findings indicate that the occurrence of underweight remains prevalent among toddlers in the catchment area of the Marusu Primary Health Center.

Nutritional problems among toddlers, particularly underweight, continue to represent a major challenge in primary health care services across various Primary Health Center catchment areas. A study conducted at the Sukaratu Primary Health Center in Tasikmalaya Regency reported an underweight prevalence of 17.1 percent, with infectious diseases identified as the dominant factor influencing nutritional status (Musyaffa et al., 2024). Similar findings were reported in the catchment area of the Anggut Primary Health Center in Bengkulu City, where a significant association was observed between dietary consumption patterns and the occurrence of underweight among toddlers (Putri RH et al., 2024).

Most toddlers with underweight nutritional status were found in the 12 to 23 month age group, which is part of the broader age range of 12 to 36 months. A study conducted in the catchment area of the East Martapura Primary Health Center in 2021 showed that the highest prevalence of underweight occurred in this age group, at approximately 28.1 percent, and was significantly associated with low maternal knowledge regarding nutrition and local supplementary feeding, with a p-value of 0.000 (Nabila et al., 2021). Similarly, a study in Tangerang Regency in 2023 reported that 18 percent of toddlers aged 6 to 23 months were classified as underweight, with the largest proportion observed in the 12 to 23 month age group. In this population, the risk of underweight was influenced by deficits in energy and carbohydrate intake, as well as a history of acute respiratory infections, with a p-value of less than 0.05 (Werdani and Syah, 2023).

Toddlers' nutritional status is influenced by both direct and indirect factors. Direct factors include dietary intake and infectious diseases, while indirect factors encompass maternal knowledge and attitudes toward child nutrition. Additional indirect determinants include household food security, child caregiving practices, and a healthy living environment, including access to health services. Underweight nutritional status reflects an imbalance between food intake and infectious disease burden and is strongly influenced by environmental and socioeconomic factors, such as household economic status, maternal education, household hygiene, and access to health care services (Nabila et al., 2021).

Data analysis using the Wilcoxon Signed Rank Test was performed to assess paired differences in toddlers' body weight before and after the local food–based supplementary feeding intervention. The results showed a p-value of less than 0.000, which is substantially

below the significance threshold of $\alpha = 0.05$. This finding indicates a highly significant difference in body weight before and after the intervention. Therefore, local food–based supplementary feeding had a significant effect on increasing body weight among underweight toddlers in the catchment area of the Marusu Primary Health Center in 2024.

These findings are consistent with a study conducted in the catchment area of the Lembeyan Primary Health Center in Magetan Regency, where toddlers who received local supplementary feeding in the form of date and banana–based smoothies experienced significant weight gain (Mulyati et al., 2022). Similar results were reported in Taktakan Village, Serang City, where a p-value of less than 0.05 indicated a significant difference in toddlers' body weight before and after the provision of local food–based supplementary feeding for 14 days. These findings further support the effectiveness of local food–based supplementary feeding in improving body weight among underweight toddlers (Purbaningsih and Ahmad Syafiq, 2023).

To address undernutrition among toddlers, the implementation of supplementary feeding programs is essential. Such programs aim to improve children's nutritional status and meet their nutritional requirements to achieve optimal nutritional conditions appropriate for age. Supplementary feeding for children aged 6 to 59 months functions as an addition rather than a replacement for daily main meals and is based on local food ingredients with region-specific menus adapted to local conditions (Ramazana et al., 2024).

Supplementary feeding not only provides direct benefits to toddlers through improvements in nutritional status but also yields important indirect benefits. One notable indirect impact is the enhancement of maternal knowledge. During the supplementary feeding process, mothers are not only involved in food provision but also receive information and education regarding the importance of adequate nutrition to support toddlers' growth. The role of parents in providing appropriate nutrition is crucial, as it has a substantial influence on children's health and future outcomes (Ramadhania et al., 2025).

Maintaining the health of infants and toddlers is essential to support optimal physical and mental development, which is strongly influenced by the provision of balanced and adequate nutritional intake. Efforts to improve community nutrition are directed toward enhancing individual nutritional quality through the promotion of healthy and nutritious diets, particularly in the context of Indonesia's double burden of malnutrition. This issue plays a critical role in national strategies aimed at developing a healthy, intelligent, and productive human resource base (Rosyida et al., 2024).

CONCLUSION

Nutritional problems among toddlers, particularly underweight, remain a serious challenge in Primary Health Center catchment areas, including the Marusu Primary Health Center. Local food–based supplementary feeding has been proven to have a highly significant effect on increasing body weight among toddlers. In addition to improving body weight, local supplementary feeding also has a positive impact on enhancing mothers' knowledge and awareness regarding the importance of adequate nutrition for children's growth.

Based on the findings of this study, the practical implication for parents is that local food–based supplementary feeding can be utilized as an effective supportive strategy to help

increase body weight among toddlers with underweight nutritional status. Parents are encouraged to consistently provide local supplementary feeding as a complement to main meals by using locally available food ingredients that are compatible with household dietary practices. Furthermore, parents should ensure the regularity of supplementary feeding and maintain a balanced daily diet for toddlers to optimize weight gain. Active parental involvement in routine monitoring of toddlers' body weight at integrated health posts or primary health centers is also essential to evaluate changes in nutritional status and to adjust nutritional improvement efforts on an ongoing basis.

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