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THE ROLE OF MANAGEMENT IN IMPROVING THE NUTRITIONAL STATUS OF CHILDREN UNDER FIVE IN PEKALONGAN CITY

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ABSTRACT

Malnutrition among children under five remains a significant public health issue in Pekalongan City, affecting their growth, development, and long-term quality of life. In response, the local government has implemented a Supplementary Feeding Program (PMT) using locally sourced, high-nutrient food ingredients that are affordable and accessible. This study aims to analyze the implementation of local food-based PMT and its impact on improving the nutritional status of malnourished children under five. Employing a mixed methods approach, the study combined quantitative research using a case control design with qualitative data from in-depth interviews. A total of 280 malnourished children were selected through purposive sampling. Key variables measured included nutritional status (based on weight-for-age) and the type and frequency of PMT provided. Data were collected via anthropometric assessments and direct observation, and analyzed using the Wilcoxon test. The findings revealed a statistically significant improvement in the nutritional status of the children following a 30-day local food-based PMT intervention ($p < 0.05$). The PMT menus—featuring ingredients such as tempeh, eggs, sweet potatoes, and local vegetables—were shown to meet daily energy and macronutrient requirements. The study concludes that local food-based PMT is an effective, sustainable strategy to address childhood malnutrition and can serve as a model for community-based nutrition interventions.

KEYWORDS *Supplementary feeding; local foodstuffs; nutritional status; children under five; The City of Pekalongan.*

INTRODUCTION

Local Supplementary Food Program (PMT) management is an important strategy in an effort to improve nutritional status in Indonesia (Fetriyuna et al., 2023; Ghodsi et al., 2016; Ghodsi, Omidvar, et al., 2018; Ghodsi, Rashidian, et al., 2018). Nutritional status is a reflection of public welfare and health. According to an analysis conducted by UNICEF, WHO and the World Bank Group in 2023, the trend of the prevalence of malnutrition or stunting is around 22.3% or 148.5 million children under the age of 5 globally in 2022. For the incidence of malnutrition (wasting) is around 6.8% or 45 million children under the age of 5 globally in 2022.

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The implementation of Recovery Supplementary Feeding (PMT Recovery) as an effort to improve the nutritional status of toddlers who suffer from malnutrition or malnutrition has been carried out for a long time (Aini et al., 2023; Ewen et al., 2015; Matilsky et al., 2009; Rashid et al., 2022; Udoh et al., 2022). PMT Recovery is determined to help meet nutritional adequacy in toddlers, especially skinny toddlers in the form of toddler biscuits that are included in the manufacturer's PMT type. PMT Recovery biscuits are formulated to contain a minimum of 160 calories, 3.2 – 4.8 grams of protein, and 4.72 grams of fat per 40 grams of biscuits. Based on the technical instructions for supplementary feeding, the main target of supplementary feeding is that toddlers aged 6-59 months are categorized as thin based on the results of weight measurement according to length/height (BB/PB or BB/TB) with a value of less than minus two standard deviations (<-2 SD) with a duration of feeding time of 90 days according to consumption rules.

The local food-based PMT program in 2024 is expected to be more effective so that it can reduce the prevalence of stunting in accordance with the 14% RPJMN and improve the nutritional status of toddlers in Pekalongan City. When compared to the previous year, this year's local PMT has 56 (fifty-six) HMAs, according to the Ministry of Health's Jurisprudence and sourced from BOK funds. This year has been equipped with monitoring and evaluation sheets before and after the provision of additional food (PMT) based on local food.

Supplemental feeding made from local food has been proven to be effective in improving children's nutritional status (Kerstis et al., 2021; Murray et al., 2016; Satterfield et al., 2018). Research conducted in Taktakan Village, Taktakan District, Serang City is effective in increasing the weight of toddlers with the condition of toddlers who previously experienced weight faltering, underweight toddlers and undernourished toddlers. Supplementary feeding is an effort to improve nutrition by meeting nutritional needs and achieving good nutritional status. Additional foods available can be in the form of family food menus based on local foods in the residential environment by processing food and the menu according to the age of toddlers. Of course, local food is more diverse than manufactured food, but the cooking method and time must still be considered so that the nutritional content is maintained.

Providing the right additional food and local food not only helps increase the weight of toddlers who previously experienced weight faltering, underweight, and malnutrition, but can also reduce the risk of stunting and wasting in toddlers. PMT as part of the intervention to restore nutrition for toddlers can have a significant impact in improving the nutritional status and health of toddlers who need special attention (Naulia et al., 2021; Sephani, 2023). Therefore, although there is a lot of research on local food-based supplementary feeding that has been implemented in various regions, there is still a need for a thorough identification of the effectiveness of its implementation. This identification needs to be done to understand the extent to which the program has succeeded in achieving the goal of improving the nutritional status of toddlers and to identify factors that affect the success or failure of the program.

The identification of local food-based supplementary feeding management in this study is expected to contribute to increasing understanding of the effectiveness or not of local food-based supplementary feeding management in reducing stunting rates and improving the nutritional status of toddlers and providing recommendations for the improvement and development of the program in the future (Moreno-Opo et al., 2015; Muflih et al., 2020; Nane et al., 2019).

Several previous studies have explored the effectiveness of supplementary feeding programs based on local food ingredients. For instance, Yanti et al. (2022) found that local PMT in Malang was effective in increasing toddlers' weight and hemoglobin levels, indicating its potential to reduce anemia and underweight conditions. Similarly, Wulandari & Andriani (2021) showed that local food-based PMT in Kulon Progo positively impacted the nutritional status of toddlers after 30 days of intervention. However, most of these studies have not yet incorporated a systematic analysis of PMT management and its implementation monitoring system. The novelty of this study lies in its focus on evaluating not only the impact of local food-based PMT on toddlers' nutritional status but also the quality of its management in a decentralized urban setting like Pekalongan City.

Based on the above background description, the researcher is interested in analyzing the management of local food-based supplementary feeding (PMT) and its effect on changes in the nutritional status of children under five in Pekalongan City. This research on local PMT was carried out in Pekalongan with the flow and reasons based on the results of the 2023 Indonesian Health Survey (SKI), the prevalence of stunting in Pekalongan City is currently 28.2 percent, an increase of 5.1 percent compared to 23.1 percent in 2022.

Based on the facts described above, this study aims to analyze the role of management in improving the nutritional status of children under five in Pekalongan City. The benefits of this research include offering policy recommendations for local governments to improve PMT implementation strategies, enhancing nutritional outcomes, and ultimately reducing the prevalence of stunting and wasting among Indonesian toddlers.

RESEARCH METHOD

This study uses the Mixed Methods Research Study approach, which combines quantitative and qualitative approaches. The quantitative approach uses a case control study design, while the qualitative approach is carried out through in-depth interviews to gain a deep understanding of the implementation of local food-based supplementary feeding management (PMT).

The research sample consisted of 280 children under five who were malnourished and selected by purposive sampling technique based on certain criteria. The variables studied in this study included the nutritional status of children under five based on the indicator of body weight by age (BB/U), as well as the type and frequency of additional feeding received during the intervention period.

Quantitative data collection was carried out through anthropometric measurements and direct observation of PMT administration activities. Meanwhile, qualitative data was collected through in-depth interviews with cadres and parents of toddlers to explore understandings, attitudes, and practices related to the management of PMT based on local ingredients.

Quantitative data were statistically analyzed using the Wilcoxon test to determine changes in nutritional status before and after the intervention. Qualitative data analysis was carried out with a thematic approach to find patterns of meaning from the obtained narratives.

RESULTS AND DISCUSSION

This section of results and discussion presents important findings in the research in a narrative manner and accompanied by in-depth interpretation. The results were analyzed based on two approaches, namely quantitative through the Wilcoxon test and qualitative through in-depth interviews. This study aims to determine the effectiveness of providing PMT based on local food on the nutritional status of children under five in Pekalongan City.

Descriptively, before the intervention, all study subjects (n=280) were categorized as undernourished based on the weight-by-age indicator (BB/U). After giving PMT for 30 days, there was an improvement in nutritional status in most of the toddlers.

The results of the Wilcoxon test showed that there was a significant difference between the nutritional status of children before and after the PMT intervention ($p = 0.000$; $\alpha < 0.05$), indicating that the administration of PMT had a significant effect on improving the nutritional status of children under five.

Table 1. Results of Statistical Analysis of the Relationship of Research Variables to the Nutritional Status of Toddlers (BB/U) in Pekalongan City

Yes	Variable	Cases (n=140)	Control (n=140)	p-value	OR	95% CI
1	Local PMT Management (good)	95 (67,9%)	115 (82,1%)	0,014*	0,45	0,24 – 0,85
2	Local Food-Based PMT Program (running well)	88 (62,9%)	120 (85,7%)	0,001*	0,28	0,15 – 0,54
3	ISPA History (exists)	74 (52,9%)	49 (35,0%)	0,005*	2,06	1,24 – 3,44
4	History of Diarrhea (available)	63 (45,0%)	38 (27,1%)	0,003*	2,20	1,30 – 3,71
5	Energy & Protein Intake (less than needed)	102 (72,9%)	68 (48,6%)	0,000*	2,94	1,73 – 5,00
6	Z BB/U score (undernutrition category)	140 (100%)	0 (0%)	–	–	–
7	Z TB/U score (short category/stunting)	79 (56,4%)	42 (30,0%)	0,001*	2,92	1,74 – 4,91
8	Z BB/TB score (lean category)	85 (60,7%)	50 (35,7%)	0,002*	2,78	1,65 – 4,69

Ket : * = statistically significant at $\alpha < 0.05$
Statistical test: Chi-Square, OR = Odds Ratio, CI = Confidence Interval

Table 1 shows the results of the analysis of the relationship between various variables and the nutritional status of toddlers (based on the BB/U indicator) in 280

respondents consisting of 140 cases of toddlers (undernourished) and 140 control toddlers (normal nutrition).

From the results of the analysis, it was found that good local PMT management was significantly related to a reduced risk of malnutrition in toddlers (OR = 0.45; p = 0.014). This means that toddlers who receive local PMT with good management have a 55% smaller chance of experiencing malnutrition than toddlers who receive PMT with poor management.

Furthermore, a well-running local food-based PMT program also showed a significant relationship with nutritional status (OR = 0.28; p = 0.001). This shows that the successful implementation of local food programs plays an important role in improving the nutritional status of children under five.

Conversely, the presence of a history of ISPA and diarrhea in toddlers significantly increased the risk of malnutrition (OR = 2.06 and OR = 2.20, respectively). Infectious disease conditions such as ISPA and diarrhea can interfere with the absorption of nutrients, increase energy loss, and decrease children's appetite.

Insufficient energy and protein intake also showed a strong association with the incidence of malnutrition (OR = 2.94; p < 0.001). This strengthens the important role of macronutrient adequacy in supporting the growth and development of toddlers.

In addition, additional anthropometric indicators such as the Z TB/U (height by age) score and the Z BB/TB (weight by height) score also showed a meaningful relationship. Toddlers with short status (stunting) and thin have a higher risk of malnutrition (OR = 2.92 and OR = 2.78, respectively).

These findings are in line with the literature that states that nutritional status is influenced by multidimensional factors, including nutrition intervention management, children's health conditions, and nutrient intake (1,2). This research supports the importance of integration between PMT programs, family education, and infectious disease monitoring in order to improve the nutritional status of children under five.

CONCLUSION

This study concluded: 1) Good management of local supplementary feeding (PMT) plays a significant role in reducing the risk of malnutrition in children under five, 2) The successful implementation of local food-based PMT programs has been proven to be effective in improving the nutritional status of toddlers, 3) History of infectious diseases such as ISPA and diarrhea has contributed to the increased risk of malnutrition, and 4) Insufficient energy and protein intake and abnormal anthropometric conditions (such as short and thin) are important factors related to the nutritional status of toddlers. Therefore, a holistic and sustainable management approach is needed in nutrition intervention programs to achieve overall improvement in children's nutritional status.

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