International Journal of Medicine and Health
Volume 4, Number. 1 March 2025
E-ISSN: 2962-1178- P-ISSN: 2962-0880, Page 140-150
DOI: https://doi.org/10.55606/ijmh.v4i1.6101
Available Online at: https://journal.amikveteran.ac.id/index.php/ijmh

The Effect of the Supplementary Feeding Program on Changes in the Body Weight of Undernourished Infants Aged 6-11 Months at the Tiley Health Center

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Abstract. Toddlers are a vulnerable group prone to health problems and malnutrition due to their rapid growth and high nutritional needs. Nutritional status serves as an indicator of adequate dietary intake, commonly assessed through weight and height measurements. Malnutrition, particularly among children aged 2-5 years, often occurs as they transition to family diets while maintaining high physical activity levels. Appropriate complementary feeding starting at six months (MP-ASI) is essential to support optimal growth and development. The Complementary Feeding Program includes porridge for infants aged 6-11 months and biscuits for children aged 12-24 months, aiming to improve nutritional status, especially among low-income families. Supplementary feeding (PMT) is an intervention designed to enhance the nutritional status of malnourished children without replacing their main daily meals. This study aims to examine the effect of the supplementary feeding program on weight changes among malnourished infants aged 6-11 months at the Tiley Health Center. A pre-experimental one-group pretest-posttest design was used with total sampling of 20 mothers with malnourished infants. Data were collected using questionnaires and weight observation sheets and analyzed using a paired t-test. The results showed a significant effect ($p < 0.05$), indicating that the supplementary feeding program improves infants' weight.

Keywords: Infant Nutrition; Malnutrition; MPASI; Tiley Health Center; Weight Loss.

1. INTRODUCTION

Development in Indonesia is essentially designed to elevate the prosperity and safety of the entire populace. The entitlement of Indonesian people to enhance their living standards is a fundamental human right (HAM) protected under the Constitution of the Republic of Indonesia (Nugraha & Salam, 2017). A healthy, normal child will grow and develop according to their genetic makeup. However, this growth is greatly influenced by the nutritional intake they consume in their daily diet.

Toddlerhood is a period of growth and development, making it a crucial time. Nutritional needs must be met, for example, by providing nutritious foods. The food given to infants and children is used for growth, therefore, nutritional status and growth can be used as a measure to monitor infant nutritional intake (Podungge & Rasyid, 2019). The 6-24 month timeframe is a age of heightened susceptibility, marking the evolution from breast milk to supplementary formulas or solid foods and subsequent environmental interaction. Inappropriate complementary feeding (MP-ASI) is provided in sufficient quantities, both in terms of quantity and quality. Insufficient nutritional intake from MP-ASI for children 6-24 months old will trigger physical growth disturbances and undernutrition issues. Therefore, to address the problem of malnutrition, it is necessary to improve the quantity and quality of MP-ASI. To

Naskah Masuk: 31 Januari 2025; Revisi: 23 Februari 2025; Diterima: 20 Maret 2025; Terbit: 31 Maret 2025

obtain good MP-ASI in terms of quantity and quality, medical personnel's involvement is required for delivering information on good feeding practices for children under 2 years of age to mothers, caregivers, and families (Chandradewi & Darawati 2004).

Breast milk, as the sole nutrition for neonates during their first six months, is considered crucial for child growth and development. Government recommendations and even WHO policies on this matter have been established and published worldwide. Regular anthropometric measurements can monitor a child's growth, thus assessing nutritional status and preventing and detecting growth faltering.

Nutrition represents a primary challenge within the worldwide population structure; global malnourished children count hits 104 million, with malnutrition driving a third of infant fatalities across the globe. Nutritional concerns constitute a vital element of the Sustainable Development Goals (SDGs) international consensus. Specifically, nutrition centers on SDG 2 ending hunger, securing food, enhancing nourishment, and advancing eco-friendly farming while serving as a crucial pillar for reaching numerous additional objectives. Generally, the SDGs' nutritional framework seeks to encourage nutritious, ecological eating habits while guaranteeing worldwide food stability. This synthesis intends to outline the nutritional function within the SDG framework, emphasizing modern findings regarding sustainable consumption and its possible consequences for human health and planetary ecology (Ministry of Health, 2018).

Nutritional Status Monitoring (PSG) data in 2016 showed the prevalence of malnutrition in toddlers was 3.4% and undernutrition was 14.4%. The prevalence of stunting in toddlers was 19.0% and very stunting in toddlers was 8.5%. Wasting in toddlers was 8.0% and very wasting in toddlers was 3.1%. Using the 2018 Riskesdas evidence base, the national prevalence of wasting and very wasting nutritional status in toddlers was 12.1% in 2013 and 10.2% in 2018. West Nusa Tenggara Province is the province with the highest proportion of wasting and very wasting nutritional status, exceeding the national average of 14.4% in 2018. Meanwhile, for the proportion of obese nutritional status, West Nusa Tenggara Province is the province with the lowest prevalence rate, namely 3.3% while the national average is 8%. The national prevalence of obese nutritional status in toddlers was 11.8% in 2013 and 8% in 2018 (Ningsih 2024).

In a previous study, 43 toddlers with malnutrition in East Tanjung Jabung Regency, particularly in the Simpang Pandan Community Health Center (Puskesmas Simpang Pandan), were found to be undernourished. This incident has become a focus for toddlers because it can increase if not given proper attention by health workers and other relevant parties. One specific

intervention effort implemented in East Tanjung Jabung Regency is by providing locally sourced Infant and Child Food (PMBA) in accordance with the 2023 local PMT provision technical guidelines. PMBA activities using local food are expected to foster family independence in providing quality food for toddlers (Astria & Sari 2020).

Mothers are one of the factors influencing the provision of supplementary food to infants. These determinants comprise education, health, maternal career, practitioners, local customs, and social-economic factors. Mothers' lack of knowledge about the benefits of exclusive breastfeeding is closely related to the provision of supplementary food to infants aged 0-6 months. Insufficient breastfeeding rates are triggered by the early provision of complementary foods. Low levels of maternal education about breastfeeding result in mothers more often bottle-feeding their babies than breastfeeding. In fact, newborns aged merely four weeks are commonly provided fruit or softened grains to augment their primary breast milk (Utami, 2010).

Introducing solid foods (MP-ASI) prior to six months can result in various chronic and immediate adverse effects. Immediate complications from early supplementation involve the infant missing vital breast milk components, decreased suckling strength, and the onset of diarrhea or anemia. Prolonged consequences of premature feeding include risks of obesity, high blood pressure, arterial disease, and allergic reactions. The improper introduction of these foods stems from various factors, notably maternal employment obligations (Ningsih, 2024).

In reality, the practice of providing complementary foods before six months of age is still widespread in developing countries like Indonesia. This leads to high rates of infections, such as diarrhea, respiratory infections, allergies, and growth disorders. Inadequate nutritional intake can also lead to malnutrition in children, which ultimately increases morbidity and mortality rates. High poverty rates impact low purchasing power, resulting in uncertainties about the quality, quantity, and hygiene of complementary foods. In contrast, in developed countries, where purchasing power is high and people understand how to properly prepare complementary foods, the quality and quantity of complementary foods are guaranteed.8 Therefore, it is perfectly normal for nutritional status to be within good limits at twelve months of age (Fitriana & Anzar 2013).

Efforts to reduce the practice of early complementary feeding can be achieved by increasing the knowledge of mothers and families. This knowledge-raising activity involves providing health education and counseling to help mothers and families better understand the dangers, impacts, and risks of early complementary feeding for infants. The role of health workers as information providers is crucial in actively promoting the exclusive breastfeeding

program (Ningsih, 2024). Initiatives to enhance the wellness and dietary condition of infants and children through improved feeding behavior are an integral part of comprehensive nutrition improvement efforts. Several studies have shown that malnutrition in infants and children is caused by inappropriate complementary feeding practices. Lack of knowledge about infant and child feeding practices, along with unhealthy habits, are both direct and indirect causes of malnutrition in children, particularly those under 2 years of age (Chandradewi & Darawati, 2004).

Based on the description of the problem above, the primary goal is to ascertain the overall the effect regarding the supplementary feeding program on changes in the weight of infants with malnutrition aged 6-11 months at the Tiley Care Community Health Center.

2. RESEARCH METHOD

Researchers utilized an analytical research methodology within the Pre-Experimental Design framework, specifically adopting a One Group Pretest-Posttest arrangement. The aim of this research is to determine the effect of the supplementary feeding program on changes in the weight of infants with malnutrition aged 6-11 months at the Tiley Care Health Center.

Total sampling was the chosen technique, that is, a sample taken from the entire population. The sample size used was 20 mothers with infants and toddlers with malnutrition at the Tiley Health Center. The instruments used were a knowledge questionnaire and a weight observation sheet. Weight measurements were conducted using the Ministry of Health's anthropometric kit. This study used a normality test to determine whether the data was normally distributed. The statistical test used was the Paired T-Test, which was conducted using SPSS computerization.

3. RESULTS AND DISCUSSION

Research Results

The inquiry was executed on 20 respondents consisting ofmothers with infants and toddlers with malnutrition at the Tiley Care Community Health Center. The research data are presented in univariate and bivariate forms to describe the characteristics of the respondents.

Respondent Characteristics

Table 1. Respondent Characteristics (N: 20).

Characteristics	Frequency	%
Respondent Age		
6-7.5 months	6	30%
7.6-8.5 months	4	20%
8.6-9.5 months	5	25%
9.6-10.7 months	5	25%
Total	**20**	**100%**

From the data presented earlier, one observes that most of the 20 respondents were aged 6-7.5 months, with 6 respondents (30%), aged 7.6-8.5 months with 4 respondents (20%), aged 8.6-9.5 months with 5 respondents (25%), while aged 9.6-10.7 months with 5 respondents (25%).

Frequency Distribution of Respondents' Body Weight Before and After

Table 2. Frequency Distribution of Respondents' Body Weight.

Weight	f	%
Pretest		
5-5.5 kg	3	15%
5.6-6 kg	10	50%
6.1-7 kg	7	35%
Posttest		
5.6-6 kg	2	10%
6.1-7 kg	12	60%
7.1-8 kg	6	30%

Based on the initial body weight, the majority were 5.6-6 kg, as many as 10 respondents (50%), body weight of 5-5.5 kg as many as 3 respondents (15%), body weight of 6.1-7 kg as many as 7 respondents (35%). Based on the final body weight, the majority were 6.1-7 kg as many as 12 respondents (60%), body weight of 5.6-6 kg as many as 2 respondents (10%), body weight of 7.1-8 kg as many as 6 respondents (30%).

Frequency Distribution of Respondents' Height Before and After

Table 3. Frequency Distribution of Respondents' Height.

Height	f	%
Pretest		
60-62 cm	4	20%
63-64 cm	13	65%
65-66 cm	3	15%
Posttest		
60-62 cm	2	10%
63-64 cm	2	10%
65-66 cm	11	55%
67-68 cm	5	25%

Based on height before the majority, height 63-64 cm was 13 respondents (65%), height 60-62 cm was 4 respondents (20%), while height 65-66 cm was 3 respondents (15%). Based on height after the majority, height 65-66 cm was 11 respondents (55%), height 67-68 cm was 5 respondents (25%), height 63-64 cm was 2 respondents (10%), while height 60-62 cm was 2 respondents (10%).

Frequency Distribution of Nutritional Status Before and After Respondents

Table 4. Frequency Distribution of Respondents' Nutritional Status.

Nutritional Status Before	***f***	***%***
Pretest		
Normal	0	0
Malnutrition	20	100%
Posttest		
Normal	14	60%
Malnutrition	6	30%

Based on nutritional status before the intervention, the majority of all respondents were malnourished (20 respondents (100%). Meanwhile, after the intervention, 14 respondents (60%) were normal and 6 respondents (30%) were malnourished.

Influencesupplementary feeding program for changes in the weight of malnourished babies aged 6-11 months at the Tiley Care Community Health Center.

Table 5. Wilcoxon Test Results for Changes in Nutritional Status, Weight, and Heigh.

Test Statistics			
	Nutritional Status After - Nutritional Status Before	**Final Body Weight - Initial Body Weight**	**Final Height - Initial Height**
Z	-3.742b	-3.542c	-3.542c
Asymp. Sig. (2-tailed)	.000	.000	.000

The table above shows that supplemental feeding can alter weight, height, and nutritional status. The Wilcoxon test yielded a p-value of 0.000. Because the p-value is smaller than $\alpha = 0.05$, Ha is accepted. These findings indicate that supplemental feeding can influence changes in weight, height, and nutritional status of infants or toddlers with poor nutritional status at the Tiley Care Community Health Center.

Discussion

Data from this research suggest that a statistically significant effect of infant and young child feeding on weight gain. This implies that infant and young child feeding influences weight gain, height gain, and nutritional status in children. This finding aligns with research conducted by Nelista, which found that supplementary feeding significantly impacts weight gain in malnourished children. Furthermore, this finding aligns with research conducted by Alfian (2023), which found that infant and young child feeding patterns positively impact weight gain in toddlers.

Providing food for babies and children is an activity of providing nutrients that aims to restore the nutrition of toddlers with malnutrition status by providing food with sufficient and balanced nutritional content so that the nutritional needs of toddlers can be met, provided every day to improve nutritional status and provided free of charge to toddlers with malnutrition in the Tiley Community Health Center work area.

Between 6 and 9 months of age, children are introduced to family foods. If family foods are not introduced to children and they are given foods with a runny consistency, these foods will not meet their nutritional needs. Runny foods have a lower nutritional content than solid foods. It's important to recognize that the 6-11 month period is the learning period for eating, learning to taste, chew, and swallow. Breast milk remains the primary source of energy, protein, and micronutrients. A toddler's age is related to their feeding patterns, which will impact their nutritional intake. If nutritional intake during infancy is insufficient, the toddler will tend to lose weight and become malnourished. If a toddler's nutritional needs are not properly managed, they will experience poor growth and development and are susceptible to malnutrition.

Based on before and after weight, weight significantly influences the nutritional status of children's complementary foods (MPASI). This is because at the beginning of MPASI, children are more enthusiastic about trying new things besides exclusive breastfeeding. However, some babies are reluctant or have difficulty eating because of the strange texture. A child's weight gain is greatly influenced by the nutritional intake they obtain, both from breast milk and MPASI provided by their mother. The correct pattern of MPASI provision will support a child's weight gain; the older the child, the more weight they will gain. The more mothers gain knowledge about how to provide nutritious additional foods, the more their child's weight will increase.

Based on before and after height measurements, if a baby or toddler's weight increases with activity, height also impacts their nutritional status. Therefore, height also influences nutritional status. However, height doesn't increase as rapidly as a baby or toddler's weight.

Based on nutritional status before and after this condition, it shows that children's growth increasingly deviates from the normal curve with increasing age. This result is acceptable because many factors influence nutritional status, and it is difficult to expect improvement through counseling alone. In addition to counseling, it is best to conduct it two to three times a week to help mothers understand the proper pattern of complementary feeding. The table shows that six respondents are still malnourished, usually due to several factors, such as family economic factors, low birth weight, and maternal knowledge.

Based on the effect of supplementary feeding on weight, height, and nutritional status. The important role of providing complementary foods alongside breastfeeding programs for children aged six months and above is aimed at reducing malnutrition and child morbidity. Malnutrition is a complex phenomenon rooted in various determinants, including suboptimal feeding practices for infants and young children. Malnutrition in children impacts a child's ability to cope with illness, cognitive development, work productivity, and health consequences in adulthood, which can impact financial burdens and economic growth. Poor feeding practices also contribute to micronutrient deficiencies. Feeding behaviors and methods can influence food intake and nutrient intake, which in turn impacts children's growth (Sahroni & Rachmawati 2023). In this study, the practice of providing complementary feeding includes the diversity of food ingredients, processing methods, and methods of administration.

Based on factors, there are several babies or toddlers whose growth and development are not appropriate for their age, such as the failure to provide complementary foods, due to several factors, for example economic factors.

Economic factors can also influence a child's success in gaining weight, but it does not rule out the possibility that children with parents with good economic status have poor nutritional status. This can occur due to other factors that influence a child's nutritional status. Factors such as food diversity consumption, parenting patterns, family support, environmental factors, and many other factors can affect a child's nutritional status. Based on the facts and theories above, there are similarities between the results of the 2019 Kumala study along with data from research undertaken in the Simpang Pandan Community Health Center work area. In univariate analysis of the results of the study, it can be concluded that toddlers who received a two-week intervention and parents provided balanced nutrition education. Parents who have been given education related to health education and education on providing appropriate infant and child feeding according to the stages, changes in weight gain, height, and MUAC can be seen in measurements the following month. It is hoped that parents can provide additional food to infants and children not only to provide a feeling of fullness but also pay attention to the balanced nutritional content of the food provided, so that the food consumed can contribute to weight gain in toddlers with malnutrition.

Following the evidence by Nova et al. (2020), suggesting that satisfying the basic nutritional demands of all infants significantly influences the incidence of stunting. Providing nutrition to children requires a crucial role from mothers. Mothers must be able to provide attention, support, and behave well, especially in providing nutrition. Parental feeding practices

are significantly associated with the incidence of malnutrition. Children with poor feeding practices, poor hygiene, and poor health practices are at higher risk of malnutrition.

In this study, there were respondents with good economic status, but the mother of the child had mental retardation, which could affect parenting patterns within the family and lead to the child's nutritional status being poor. Therefore, factors such as parenting patterns, parental support, parental attention, and parental knowledge can also influence the incidence of malnutrition in children, even if the parents are well-off and live in a good environment.

Providing proper nutrition to infants and children can result in good nutrition, optimal brain development, and optimal immune system function, as well as optimal growth and development. Proper nutrition for infants and children can contribute to optimal weight gain, ensuring healthy growth and development, while preventing malnutrition in toddlers.

Providing infant and young child food to undernourished toddlers is crucial to help meet their nutritional needs, supporting their growth and development and increasing their weight. Supplemental food for undernourished toddlers can be obtained from tubers, such as purple sweet potatoes, which can be used in a variety of snacks and staple foods.

4. CONCLUSION

According to the findings and discussion of the study on the effect of the supplementary feeding program on changes in the weight of malnourished infants aged 6-11 months at the Tiley Health Center, it can be concluded that there is an effect of providing complementary feeding on increasing the weight, height, and nutritional status of children with a p value of 0.000.

Suggestions for community health centers are expected to always check the nutritional status of children regularly in collaboration with the Health Office to improve the nutritional status of children. There needs to be counseling for parents regarding good eating patterns for children and continue to support the provision of infant food, children in malnourished toddlers, and frequent counseling at every mother's event so that mothers can share more. For authors or future researchers, it is hoped that further researchers will emphasize the PMBA Mandiri program to the community by providing education to respondents, and can add other research variables, for example, looking at the influence of eating patterns, residential environment, posyandu environment, the influence of culture, sanitation on weight gain in malnourished toddlers, and can add customs in other areas. And suggestions for Educational Institutions are expected and provide input in developing readings and references to increase knowledge and

insight for students and can add the latest innovations to research that will be carried out by future researchers.

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