The Effectiveness of Lumbung Hidup in Improving Toddler Nutrition Among Economically Disadvantaged Families

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AB ST R ACT

Malnutrition and stunting are significant issues among economically disadvantaged families in Kediri District, affecting children's health and development. This study assessed the Lumbung Hidup program, which established kitchen gardens and catfish farming to improve nutrition. Using a pre-experimental one-group pre-test post-test design, 22 toddlers with low body weight and stunting were monitored over three months. Pre-test data were collected before, and post-test data after the intervention. The intervention led to significant improvements in nutritional status. Mean weight increased from 11.25 kg (pre-test) to 14.48 kg (post-test 3), and mean height slightly increased from 89.29 cm to 89.98 cm. Paired sample t-tests showed significant enhancements in Z-scores for weight-for-age, height-for-age, and weight-for-height ($p < 0.05$). The Lumbung Hidup program effectively improved the nutritional status of toddlers from economically disadvantaged families, demonstrating potential for broader implementation to combat malnutrition and stunting.

I. Introduction

The prevalence of various nutritional issues, ranging from malnutrition to stunting, remains a significant concern in Kediri District in 2022. This is particularly evident among economically disadvantaged families. Poverty serves as a crucial backdrop, directly impacting families' ability to provide adequate nutrition for their children, consequently leading to stunting. Economic struggles exacerbate the challenge of meeting the nutritional needs of families, contributing significantly to the prevalence of stunting. The inability of impoverished families to afford nutritious food perpetuates a cycle of malnutrition and stunted growth among children. This economic dimension underscores the intricate relationship between poverty and nutritional deficiencies, highlighting the urgent need for targeted interventions to address both economic disparities and nutritional inadequacies to combat stunting effectively (Beal et al., 2018; Zaleha & Idris, 2022).

Nutritional issues among infants and toddlers remain a major concern for child health in developing countries, including Indonesia. Nutrition is a key indicator of infant and child health, determining growth and development, particularly during the first 1000 days of life. One significant nutritional issue in children is stunting, characterized by poor linear growth (height-for-age score). Stunting has become a global child health issue, affecting at least 22% (151 million) of children under five years old worldwide in 2017, with more than half of these cases occurring in Asia. The prevalence of stunting in Indonesia is alarmingly high, with 30-30% of children under five experiencing stunting in 2019 (Bustami & Ampera, 2020; Muna et al., 2021).

In Kediri District, the prevalence of stunting remains concerning. In 2022, the prevalence was 10.23% among 7,752 toddlers. Children with stunting are at increased risk of higher morbidity, mortality, and suboptimal cognitive and motor development. Stunting is caused by various factors, including chronic malnutrition during the first 1000 days of life, encompassing nutritional deficiencies during pregnancy. The long-term impact of stunting on child health is significant, leading to impaired cognitive and motor development and increased susceptibility to various diseases due to weakened immunity (Ghosh, 2020; Haque et al., 2022).

Economically disadvantaged families can be defined as those living below the poverty line or having limited access to adequate economic, social, and health resources. These families often struggle to meet basic needs, including food, housing, education, and healthcare (Elisaria et al., 2021; Prasiska et al., 2020). Research by Smith (2019) highlights that economically disadvantaged families frequently face significant financial limitations, affecting their access to food, housing, education, and healthcare. These conditions are often a primary factor in understanding the challenges faced by these families. A study by Johnson et al. (2020) found that economically disadvantaged families tend to experience lower health levels compared to more affluent families. Limited access to healthcare services, poor nutrition, and unhealthy environments often contribute to health problems within these families (Beal et al., 2018; Permana et al., 2021; Stasya & Sulistiadi, 2020; Vaivada et al., 2020).

One promising approach to addressing these issues is the implementation of "Lumbung Hidup" programs. Lumbung Hidup, or "Living Granaries," is a community development initiative aimed at enhancing families' access to nutritious food through activities such as urban farming, productive land management, composting, and skills training. This program seeks to bolster food sovereignty and improve the well-being of families, particularly those in low economic conditions. The benefits of Lumbung Hidup are manifold. Firstly, it provides better access to nutritious food as communities can grow and share a variety of nutrient-rich vegetables, fruits and proteins. Secondly, by involving the community in local food production, the program enhances food self-sufficiency, reduces dependency on external food supplies, and mitigates the risk of hunger (Aritonang et al., 2020; Ningtyas et al., 2023; Sarjiyah & Istiyanti, 2022; Wibowo et al., 2023). The objective of this research is to evaluate the effectiveness of the Lumbung Hidup program in improving the nutritional status of toddlers in economically disadvantaged families.

II. Methods

The research design used in this study is a pre-experimental one-group pre-test post-test design. The sampling technique used in this study is total sampling, with 22 respondents consisting of 18 toddlers with low body weight and 4 toddlers with stunting from economically disadvantaged families in the Gempolan Village area, conducted from June to November 2023. The intervention involved the creation of a Lumbung Hidup, which included the establishment of kitchen gardens and the provision of catfish in buckets at each household. The intervention was carried out over a period of 3 months. Pre-test data was collected before the establishment of the Lumbung Hidup, and post-test data was collected after 3 months of implementation. Nutritional status monitoring was conducted monthly.

III. Results and Discussion

Table 1. Characteristic of Respondents

Characteristic		N	%
Age	24-36 mo	6	27%
	36-48 mo	7	32%
	48-60 mo	9	41%
Sex	male	15	68%
	female	7	32%

The data above indicates that the age distribution of respondents does not significantly favor any one age group, with the largest age group being 48-60 months, representing 41% of the respondents. In terms of gender composition, the majority (68%) are male.

The implementation of the Lumbung Hidup program has proven to be significantly effective in enhancing the nutritional status of toddlers from economically disadvantaged families. The data collected from pre-test and post-test measurements over a three-month period illustrates this impact clearly.

Table 2. Nutritional Status Pre-Test dan Post-Test

Nutritional State	N	Pre Test			Post Test 1			Post Test 2			Post Test 3		
		Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Weight	22	11,25	9,00	12,70	12,20	10,02	13,76	13,50	11,18	15,64	14,48	12,13	16,76
Height	22	89,29	79,70	99,00	89,57	80,00	99,50	89,64	80,50	100,0	89,98	81,00	100,5

The pre-test and post-test nutritional status data above show a significant improvement from the pre-test to post-test measurements in months 1, 2, and 3. This gradual increase provides evidence that the intervention involving the creation of Lumbung Hidup can effectively improve the nutritional status of toddlers with nutritional issues. The nutritional status of the respondents improved consistently from the pre-test to the post-test assessments conducted in months 1, 2, and 3. Table 2 shows the mean weight of the toddlers increased from 11.25 kg (pre-test) to 14.48 kg (post-test 3). Similarly, the mean height increased slightly from 89.29 cm (pre-test) to 89.98 cm (post-test 3). These improvements indicate that the intervention facilitated a steady and measurable enhancement in the nutritional status of the children.

Table 3. Paired Sample T-Test (Z-Score) Pre Test-Post Test

		N	Mean	SD	SE	p-value
Z score Weight/Age	Pre Test	22	-2,36	0,32	0,07	0,006
	Post Test	22	-0,53	0,43	0,09	
Z score Height/Age	Pre Test	22	-1,44	0,75	0,16	0,000
	Post Test	22	1,86	0,85	0,18	
Z score Weight/height	Pre Test	22	-2,46	0,69	0,15	0,000
	Post Test	22	-2,44	0,80	0,17	

The statistical test results indicate a significant improvement in nutritional status, with a p-value of less than 0.05 for Z-scores of weight-for-age (BB/U), height-for-age (TB/U), and weight-for-height (BB/TB). This demonstrates the positive impact of the nutrition enhancement therapy through Lumbung Hidup. The paired sample t-tests provided in Table 3 further corroborate these findings, indicating significant improvements in the Z-scores for weight-for-age (BB/U), height-for-age (TB/U), and weight-for-height (BB/TB) from pre-test to post-test. The p-values for these measurements were all less than 0.05, underscoring the statistical significance of the nutritional improvements observed.

The Lumbung Hidup program, which encompasses the establishment of kitchen gardens and the provision of catfish in buckets for protein, plays a vital role in enhancing access to nutritious food. This practical strategy empowers families to cultivate vegetables and rear fish, ensuring a consistent supply of essential nutrients directly within their homes. By enabling local food production, Lumbung Hidup effectively addresses the economic barriers that often hinder economically disadvantaged families from accessing nutritious food. This initiative not only fosters sustainability but also offers economic benefits by reducing reliance on external food sources, thereby allowing families to allocate resources more efficiently (Ningtyas et al., 2023; Sarjiyah & Istiyanti, 2022).

Furthermore, the provision of catfish serves as a reliable protein source crucial for the healthy growth and development of children. By integrating protein-rich foods into daily diets, Lumbung Hidup helps combat malnutrition and stunting effectively. Additionally, the cultivation of a diverse range of vegetables enhances dietary variety, ensuring adequate intake of vitamins and minerals essential for overall health. This comprehensive approach not only improves immediate nutritional status but also fosters long-term health benefits (Ningtyas et al., 2023; Wibowo et al., 2023).

Moreover, Lumbung Hidup contributes to fostering self-sufficiency and resilience within communities. By imparting sustainable farming practices, the program empowers families to take control of their nutritional needs, promoting long-term food security and independence from external aid. Additionally, the initiative cultivates a sense of community solidarity, encouraging collaboration and collective efforts toward improving nutrition at the grassroots level (Aritonang et al., 2020; Ningtyas et al., 2023; Wibowo et al., 2023).

Overall, the Lumbung Hidup initiative represents a holistic approach to combating malnutrition and stunting, with far-reaching implications for individual health and community well-being. By addressing both immediate nutritional needs and fostering sustainable food production practices, Lumbung Hidup creates a robust framework for addressing nutritional deficiencies and promoting healthier lifestyles among economically disadvantaged families (Muna et al., 2021; Sarjiyah & Istiyanti, 2022; Wibowo et al., 2023).

IV. Conclusion

The data and statistical analysis from this study indicate that the Lumbung Hidup program effectively enhances the nutritional status of toddlers in economically disadvantaged families. The significant improvements in Z-scores for weight-for-age, height-for-age, and weight-for-height underscore the potential of this intervention to make a meaningful impact on child health. This comprehensive strategy should be considered for broader implementation to address malnutrition and stunting sustainably and holistically.

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