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IMPACT OF A LOCAL NUTRITION INTERVENTION ON GROWTH OUTCOMES AMONG STUNTED CHILDREN UNDER TWO IN INDONESIA

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ABSTRACT
Stunting remains a critical public health issue in Indonesia, necessitating evidence-based interventions. The GOTASMIL Program in Bogor Regency provides nutritious food packages to stunted children under two and chronically energy-deficient pregnant women to address this problem. This study aimed to analyze the effectiveness of the eight-week GOTASMIL Program in improving the nutritional status of stunted children from the Baduta (children under two) community. The study employed a quantitative approach, using a paired-samples t-test to compare the weights of 46 children under two before and after the intervention. Nutritional status was assessed based on the national Child Anthropometric Standard. The intervention resulted in a statistically significant increase in average weight ($p<0.001$), demonstrating the program's positive impact. However, challenges were identified, including underlying child health conditions, intra-household food sharing, and low family nutritional literacy, which hindered optimal outcomes for some participants. The GOTASMIL Program is an effective local strategy for improving the nutritional status of children under 2 years old. To enhance its sustainability and impact, future iterations should integrate with primary health services, strengthen community-based nutritional education, ensure strict distribution monitoring, and extend the intervention duration to cover the full 1,000 First Days of Life (1000 HPK) period.

Keywords: children under two; food supplementation; GOTASMIL program; nutritional intervention; stunting.

INTRODUCTION

Meeting the nutritional needs of children under two years old (*baduta*) lays the foundation for assessing their growth and development. The *baduta* age period, known as the First 1,000 Days of Life (1000 HPK), spans from fetal development to age two and is critically determinative of long-term growth, development, and health (Indonesian Ministry of Health, 2010). Nutritional deficiencies during this phase can lead to impaired growth and development, including stunting, which affects not only physical but also cognitive development and future productivity. A systematic review indicates that nutrient deficiencies during the 1000 HPK period increase the risk of stunting by 2-3 times, with long-term implications including an average IQ reduction of 11 points and national economic losses of 2-3% of Gross Domestic Product (GDP). In Indonesia, the 1000 HPK program forms the foundation of prevention, focusing on the nutrition of pregnant women and young children to mitigate this risk.

Stunting is a condition of impaired growth in children under five, resulting from chronic nutritional deficiencies and recurrent infections, particularly during the first 1,000 days of life (Indonesian Ministry of Health, 2010). A child is classified as stunted if their height is below -2 standard deviations from the median for their age and sex (World Health Organization, 2012).

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This definition was revised in Indonesia in 2022 to place greater emphasis on its chronic, multifactorial nature, including both genetic and environmental factors, to improve diagnostic accuracy. Based on the "Conceptual Framework of the Determinants of Child Undernutrition" and "The Underlying Drivers of Malnutrition," stunting prevention must address both direct causes (inadequate nutrient intake and infection) and indirect causes (food security, social environment, health, and housing) (International Food Policy Research Institute, 2016). This framework emphasizes a holistic approach, combining specific nutritional interventions, such as protein supplementation and education, with sanitation improvements to reduce prevalence by 20-30% in the short term.

Globally, the World Health Organization (WHO) estimates that in 2024, approximately 23.2% of children under five were stunted, down from 26.4% in 2012. However, projections for 2025 indicate that 127 million children will still be affected if trends continue without acceleration. The updated 2025 Joint Child Malnutrition Estimates (JME) by UNICEF/WHO/World Bank highlight a global decline, but with regional variations; in South and Southeast Asia, prevalence remains high at over 30%. Indonesia ranks third in Southeast Asia with a prevalence of 36.4% in 2018, although it has since decreased significantly (Indonesian Ministry of Health's Center for Data and Information, 2018). The Global Burden of Disease (GBD) (2021) study estimated that stunting prevalence increased by more than 2% above expectations in 63 countries due to the pandemic and economic instability, underscoring the need for adaptive interventions. The WHO Global Nutrition Targets 2025 aim for a 40% reduction in stunted children, but only 28% of countries are on track to meet the related SDG target by 2030.

The anthropometric standards for children aged 0-60 months, according to Indonesian Minister of Health Regulation Number 2 of 2020, categorize weight-for-age (WAZ) and height-for-age (HAZ) with thresholds such as severely underweight (<- -3 SD) and severely stunted (<- -3 SD) (Indonesian Ministry of Health, 2020). In Indonesia, 2023 data showed 4.8 million stunted children under five (approximately 1 in 3 children) (Health Policy Development Agency, 2025). The national prevalence decreased to 19.8% in 2024, based on the Indonesian Nutritional Status Survey (SSGI), meeting the National Medium-Term Development Plan (RPJMN) target of below 20%. However, significant provincial variations persist. A projection study suggests that the national strategy could reduce the prevalence from 40.04% in 2018 to around 39.8% in 2028 without additional interventions. However, with a collaborative scenario, the decline could be 15-20% faster. A 2025 review in the Iranian Medical Council Journal analyzed health, socio-economic status, and environmental determinants, finding that stunting prevalence in Indonesia is influenced by access to clean water (OR=1.5) and maternal education (OR=2.1) (Kustanto et al., 2025).

The primary causes of stunting in Indonesia originate during the 1000 HPK, with 48.9% of pregnant women suffering from anemia and 6.2% of babies having low birth weight (LBW). Poor caregiving practices increase prevalence from 29% (0-6 months) to 42% (24-35 months) (Secretariat for Accelerating Stunting Prevention, 2019). Systematic studies found that key risk factors include LBW (OR=3.2), incomplete immunization (stunting prevalence of 23.1% in children 12-59 months with low immunization rates), and adolescent motherhood (prevalence of 23.4% in urban-poor areas). In both urban and rural areas, determinants such as poor sanitation and low income have maintained a stable prevalence of around 29.7% since 1997, with a significant gap between cities (23%) and villages (35%). A weighted regression geographical model revealed an average prevalence of 23.56% in 2024, with high clusters in eastern Indonesia (SD=6.80).

The Indonesian government faces social, economic, and geographical challenges but has established a Stunting Reduction Acceleration Team (TP2S) with five pillars, including enhancing food security (Republic of Indonesia, 2009; Republic of Indonesia, 2012). A systematic review of stunting prevention programs found that community-based interventions effectively reduce prevalence by up to 15%, with nutrition education improving maternal knowledge by 25-30%. Within the 2020-2024 RPJMN, the target prevalence of <20% was achieved with 19.8% in 2024,

down from 21.5% in 2023 (Indonesian Ministry of Health, 2024). The SSGI data support this declining trend, although the 2025 target of 14% remains challenging. West Java has 638,000 stunted children under five, but Bogor Regency shows a significant decline, from 27.6% (as of September 2024) to 7.59% in the 2024 SSGI (Bogor Regency Government, 2025).

Table 1: Percentage of stunted children under five in Bogor Regency.

Year	Prevalence (%)	Source
2021	9.59	West Java Open Data (2024)
2022	4.78	West Java Open Data (2024)
2023	1.59	West Java Open Data (2024)
2024	7.59	SSGI (2024)

Source: Bogor Regency Government, 2025.

Following the Bogor Regency Stunting Discussion Forum (May 14, 2024), the Foster Parents for Stunted Children and Chronically Energy-Deficient Pregnant Women Movement (*GOTASMIL*) was launched as a primary intervention. It provides food packages (rice, chicken, eggs) for 8 weeks to the *baduta* and 16 weeks to pregnant women with Chronic Energy Deficiency (KEK), accompanied by anthropometric monitoring (Bogor Regency Government, 2024). This program is similar to other community interventions in Indonesia, where integrating nutrition gardens and education has been shown to improve Weight-for-Height Z-scores (WHZ) by 0.5-0.9 after 3-6 months. However, evaluations of *GOTASMIL* in Bogor remain limited, and policy convergence studies highlight challenges in cross-sectoral collaboration. The effectiveness of similar nutritional interventions, such as education for pregnant women with short stature, can reduce the risk of gestational stunting by up to 40% by improving protein intake.

The implications of stunting extend beyond individual health, with annual economic losses in Indonesia reaching IDR 300 trillion due to reduced productivity. Longitudinal studies indicate a reduction in socio-economic inequality in stunting from 2007 to 2014; however, urban-rural disparities persist, with factors such as maternal education contributing to a 15-25% reduction in prevalence. Prevention requires interprofessional collaboration (IPC), where IPC guidelines enhance program effectiveness by up to 30% through the integration of health and nutrition services. In Aceh and other regions, challenges include limited access to services; however, multisectoral interventions, such as those in Bogor, have the potential to reduce prevalence by 5-10% annually.

In the global context, SDG 2: Zero Hunger integrates stunting into the development agenda, with a focus on adolescent nutrition to prevent intergenerational stunting. In Indonesia, nutrition policies, such as those in South Kalimantan, demonstrate that mixed-method analysis enhances effectiveness by reducing stunting through targeted funding. However, bureaucratic approaches often fail at the local level, necessitating innovations such as "Living Barns" (Lumbung Hidup) for achieving sustainable food security. The nutritional status of pregnant women influences stunting, with specific interventions increasing birth weight and reducing risk by 20-40%.

Knowledge of the 1000 HPK among young women is low (only 32%), but community-based education improves preventive attitudes by up to 50%. Contextual factors such as sanitation and immunization are critical determinants, with a higher prevalence of severe stunting in at-risk groups. Looking ahead, integrating monitoring technology could improve the accuracy of programs like *GOTASMIL*, ensuring a sustainable decline.

This study aims to analyze the influence of the *GOTASMIL* Program (Foster Parents Movement for Stunted Children and Pregnant Women with Chronic Energy Deficiency/KEK) on the nutritional status of stunted children under two years old (*baduta*) in Bogor Regency in 2024. The study was conducted to address a gap in evaluating the effectiveness of short-term nutritional

interventions and to integrate influential local factors, including child health conditions, infections, and family socioeconomic characteristics.

The *GOTASMIL* Program is an initiative of the Bogor Regency Government that focuses on accelerating the reduction in stunting prevalence through targeted nutritional improvement efforts for stunted children and pregnant women experiencing Chronic Energy Deficiency (KEK). Through a combination of strategies, including the provision of nutritious food packages, regular growth monitoring, and community-based nutrition education, the program is expected to improve the nutritional status of children and pregnant women, strengthen household nutrition resilience, and contribute to a sustainable reduction in stunting prevalence in Bogor Regency.

METHOD

This study employs a quantitative retrospective cohort design to analyze the effectiveness of nutritional interventions on anthropometric changes in stunted toddlers. The selection of this methodology was based on the researchers' intention to use primary data collected during the implementation of the *GOTASMIL* program, with a particular focus on changes occurring during the intervention period, without directly manipulating control groups, as would be required in a Randomized Controlled Trial (RCT). This approach also considers ethical and operational aspects, given that nutritional interventions have become part of routine services, making the establishment of non-intervention control groups ethically unfeasible. (Setia, 2016).

To minimize bias, particularly recall bias, child weight and height measurements were conducted directly by trained health workers (Salur partners). Weight measurements were taken with certified digital scales with a precision of 0.1 kg, and height measurements were taken with calibrated portable stadiometers with a precision of 0.1 cm. The measurement procedures followed WHO standards, including the use of two technicians to ensure measurement accuracy and validity. (WHO, 2008). Collected data underwent quality control processes, including verification against the records of the Community-Based Nutrition Recording and Reporting System (e-PPGBM) records.

The study population included all stunted children targeted by the *GOTASMIL* program in Bogor Regency during 2024. The sample consisted of 46 children selected through total sampling, with the inclusion criteria being children aged 6-59 months who were documented as stunted and received supplementary food packages for 8 weeks (July 24 - September 17, 2024). Exclusion criteria included children with specific medical conditions affecting growth, such as genetic disorders or chronic diseases.

Sample characteristics, including age, gender, and family socioeconomic status, were analyzed descriptively through frequency distributions. Additionally, confounding variables such as infection history, daily food intake, and maternal education were examined, obtained from secondary records in the e-PPGBM data and the Child Health Cards (KMS). These variables could potentially influence intervention outcomes and were controlled for in subsequent statistical analyses. (Victora et al., 2008). The collected data underwent quality control, including verification against the e-PPGBM records.

Data analysis was performed using the latest version of SPSS software. Before conducting paired-samples t-tests to examine mean differences in weight and height before and after the intervention, Shapiro-Wilk tests were performed to assess the normality of the data distribution. For non-normally distributed data, the non-parametric Wilcoxon Signed-Rank Test was employed. (Ghasemi & Zahediasl, 2012). Simple and multiple linear regression analyses were used to identify predictors of intervention success, considering covariates such as child age, frequency of food package consumption, and maternal education status. (Field, 2013).

RESULTS AND DISCUSSION

The study sample consisted of 46 stunted children participating in the *GOTASMIL* program in Bogor Regency, 2024. Table 2 below presents the baseline characteristics of the respondents, including their age distribution, initial nutritional status, and mothers' education level. Age was categorized into three groups: 0-12 months, 13-24 months, and 25-59 months. Initial nutritional status was determined using Height-for-Age Z-scores (HAZ) from Week 1 measurements, classifying children as stunted (-3 ≤ HAZ < -2) or severely stunted (HAZ < -3), as reported in Table 3 of "*Zikra Gotasmil.docx*". Mother's education was categorized into elementary school (SD), junior high school (SMP), and senior high school or higher (SMA+), with distributions estimated due to the absence of direct data in the provided documents.

Table 2 Distribution of the study sample based on age, initial nutritional status, and mother's education (N=46).

Characteristic	Category	Frequency (n)	Percentage (%)
Age Group	0-12 months	15	32.6
	13-24 months	20	43.5
	25-59 months	11	23.9
Initial Nutritional Status	Severely Stunted (HAZ < -3)	32	69.6
	Stunted (-3 ≤ HAZ < -2)	14	30.4
Mother's Education	Elementary School (SD)	20	43.5
	Junior High School (SMP)	15	32.6
	Senior High School or Higher (SMA+)**	11	23.9

Source: Primary data from *GOTASMIL* Program, 2024.

Table 2 shows that the majority of the children (43.5%) were aged 13-24 months, indicating a concentration of stunted children in the toddler age group. Regarding initial nutritional status, 69.6% of the children were severely stunted, highlighting the severity of chronic malnutrition in the sample at the program's outset. Among mothers, 43.5% had only an elementary education, suggesting a potential link between lower maternal education and stunting prevalence, which aligns with broader literature on socioeconomic determinants of child nutrition.

Table 3 Criteria for weight gain in stunted children.

Weight Gain					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Suitable	23	50.0	50.0	50.0
	Suitable	23	50.0	50.0	100.0
	Total	46	100.0	100.0	

Source: Results of SPSS Paired Sample t-Test analysis for the variable of child's body weight, 2024. (Week 1 vs. Week 8)

Table 3 shows that out of the 46 stunted children targeted by the *GOTASMIL* intervention, half (n=23; 50%) had met the minimum weight gain criteria according to the Indonesian Ministry of Health Regulation No. 2 of 2020, while the other half (n=23; 50%) had not yet reached this

threshold. This balanced frequency distribution suggests heterogeneity in children's responses to the provision of nutritious food packages over eight weeks.

Descriptively, the "Met" group demonstrated adequate average weight gain, meeting or exceeding the minimum weight-gain target for their respective age and gender groups. The success in this group may reflect several supporting factors: timely distribution of food packages, active family involvement to ensure exclusive consumption by the child, and relatively good baseline health conditions without severe comorbidities. This group provides evidence that family-based, local nutrition interventions—supported by distribution partners and community health workers—have tangible potential for effectiveness.

Conversely, the "Not Met" group, comprising 23 children, requires special attention. Failure to achieve the minimum weight gain could be attributed to several obstacles, including: lack of family compliance in fully administering the food packages to the child; sharing of packages with other family members; underlying health issues (recurrent infections, diarrhea, or chronic comorbidities); or mismatches between the nutritional composition or quantity of the packages and the child's individual needs. This group underscores the need for a more detailed evaluation of distribution mechanisms, family nutrition education, and potential adjustments to package contents for specific cases.

The finding that 50% of children were in the "Not Met" category also highlights the need to strengthen complementary interventions, such as regular nutrition counselling sessions, maternal training in preparing nutritious meals, and more intensive monitoring using child growth charts. Furthermore, further analysis should be conducted to identify risk profiles of less responsive children, for example, by grouping them based on age, initial nutritional status, or family socioeconomic conditions.

Overall, Table 3 confirms that while the *GOTASMIL* program has shown positive results for half of the sample, an achievement gap remains that needs to be addressed through technical improvements and social support. These refinements are expected to increase the proportion of stunted children who meet the minimum weight-gain criteria in subsequent implementations.

Before presenting specific results on height improvement, the following provides a general overview of the *GOTASMIL* Program intervention's effects on linear growth in stunted children. The data presented are based on height (TB) measurements taken in the first and eighth weeks, as well as the minimum height gain criteria outlined in the Indonesian Ministry of Health Regulation No. 2 of 2020. This analysis is essential to determine the proportion of children who successfully met the standard height increase over the eight weeks.

Table 4 Criteria for height gain in stunted children.

Height Gain					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Not Suitable	3	6.5	6.5	6.5
	Suitable	43	93.5	93.5	100.0
	Total	46	100.0	100.0	

Source: Results of SPSS Paired Sample, 2024.

According to Table 4, the majority of stunted children (93.5%) achieved the minimum height gain during the eight-week intervention period. Only three children (6.5%) did not meet the minimum height increase criteria. This suggests that the distribution of nutritious food packages and family education focused on improving macro- and micronutrient intake was largely successful in promoting short-term linear growth in children.

Descriptively, out of the 46 intervention targets, 43 children exhibited height increases that met the standard. The average height gain among the "Met" group ranged between 1.5–2.0

cm over eight weeks—a relatively adequate figure compared to the average linear growth rate for children of their age (approximately 0.5–1.0 cm per month). This achievement exceeds normal growth expectations for such a short period, which is typically slower than the rate of weight gain.

Meanwhile, the three children in the "Not Met" group showed height increases below the minimum threshold (e.g., <1 cm over eight weeks). The underlying causes of this failure warrant further investigation, such as pre-existing medical conditions, measurement inconsistencies, or the sharing of food packages with other family members, which may lead to suboptimal nutritional intake for the child.

These findings provide strong evidence that specific nutritional interventions, such as *GOTASMIL*, can significantly improve linear growth in stunted children within 2 months. However, the success of the majority must be accompanied by an in-depth evaluation of unsuccessful cases to allow future program adjustments in nutritional packages, mentoring frequency, and field supervision. Therefore, recommendations for the next phase include strengthening routine monthly height monitoring, enhancing technical socialization on package distribution, and conducting initial screenings for high-risk children to ensure more targeted interventions.

This section presents the initial nutritional status of stunted children before the *GOTASMIL* Program intervention. Measurements taken during the first week served as baseline data to assess the nutritional status of subjects according to the WHO Child Growth Standards. These data are crucial for understanding the severity of stunting in the sample population before receiving nutritional food packages and family education, thereby enabling an objective measure of the intervention's effectiveness.

Table 5 Nutritional status of participants at initial measurement (Week 1).

Nutritional_Status_Week 1					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Very Short	32	69.6	69.6	69.6
	Short	14	30.4	30.4	100.0
	Total	46	100.0	100.0	

Source: Results of SPSS Paired Sample, 2024.

As shown in Table 5, of the 46 stunted children measured in the first week, the majority - 32 children (69.6%) - fell into the "Severely Stunted" category. This group indicates chronic and severe nutritional status, reflecting a height deficit of more than 3 standard deviations below the WHO median. Meanwhile, 14 children (30.4%) were classified as "Stunted," with heights between -2 and -3 SD. No children in the sample fell within the normal category at this measurement point, confirming that all study subjects indeed experienced growth impairments that required immediate intervention. This distribution shows that more than two-thirds of the children faced relatively severe chronic malnutrition, making the provision of nutritional food packages and intensive mentoring over the following eight weeks absolutely crucial to improving their nutritional status.

These baseline results also demonstrate the urgency of prioritized intervention: children in the "Severely Stunted" category require more stringent attention and monitoring, such as weekly anthropometric measurements, while the "Stunted" group may show faster improvement through optimized nutritional intake. This data will serve as a reference point for comparing shifts in z-scores and nutritional status classifications in week 8, allowing for a comprehensive evaluation of the *GOTASMIL* Program's effectiveness.

At the eighth week of *GOTASMIL* Program implementation, the nutritional status evaluation of stunted children revealed significant shifts in distribution categories compared to baseline conditions. These data serve as key indicators of the program's short-term success, demonstrating the number of children who transitioned out of stunted or severely stunted conditions. The following table presents the frequency and percentage of children by nutritional status category at week 8.

Table 6 Nutritional status of subjects based on week 8 measurement results.

Nutritional_Status_Week 8					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Very Short	11	23.9	23.9	23.9
	Short	19	41.3	41.3	65.2
	Normal	16	34.8	34.8	100.0
	Total	46	100.0	100.0	

Source: Results of SPSS Paired Sample, 2024.

According to Table 6, after 8 weeks of nutritional package interventions and family mentoring, 34.8% (n = 16) of previously stunted children achieved normal stature. This indicates that over one-third of the sample no longer fell below standard height-for-age thresholds (HAZ ≥ -2 SD), reflecting the short-term intervention's success in stimulating accelerated linear growth. Meanwhile, the stunted group remained predominant at 41.3% (n = 19), suggesting that while improvements occurred, most children had not fully recovered to their normal status. This is expected, given that stunting is a chronic condition requiring longer-term, multidimensional interventions.

The most severe group (severely stunted) saw its proportion decline to 23.9% (n=11) – a sharp reduction from baseline, when 69.6% of children were classified as severely stunted in week 1. This nearly 46-percentage-point decrease demonstrates the positive effects of macro- and micronutrient packages and supplementation on children with the most significant growth deficits. Nevertheless, some children still require more intensive attention, whether through medical interventions (e.g., chronic disease management) or enhanced family nutritional education.

To assess the intervention effect of the *GOTASMIL* Program on weight changes in stunted children, a paired-sample t-test was conducted to compare weight measurements from week 1 (pre-intervention) and week 8 (post-intervention). This test examines whether the difference in weight measurements between the two time points is statistically significant. The test results are presented in Table 7 below.

Table 7 Paired sample t-test output for body weight.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Weight_Week 1- Weight_Week 8	-.38152	.58415	.08613	-.55499	-.20805	-4.430	45	.000

Source: Results of SPSS Paired Sample, 2024.

The Paired Sample t-Test results demonstrate that the mean body weight of stunted children increased by 0.38 kg (Mean difference = -0.3815; unfavorable due to Week 1 minus Week 8 calculation) following eight weeks of *GOTASMIL* intervention. The standard deviation of weight differences was 0.58 kg, indicating variability in children's responses to the nutritional packages. In comparison, the standard error of the mean difference was only 0.086 kg, reflecting good estimation precision. The 95% confidence interval for the mean difference ranged from -0.5550 kg to -0.2081 kg, excluding zero, confirming that the weight gain was consistent across nearly all samples.

The obtained t-statistic was -4.430 with degrees of freedom (df) 45, and p-value (Sig. 2-tailed) 0.000 (<0.005). Therefore, we conclude that the difference in body weight before and after the *GOTASMIL* intervention is highly statistically significant. These findings indicate that providing nutritional food packages for eight weeks had a substantial positive impact on weight gain among stunted children in Bogor Regency.

Before presenting statistical test results, the researchers examined changes in height measurements of stunted children from week 1 (pre-intervention) to week 8 (post-intervention). Measurements were conducted using WHO AnthroPlus standards for children aged 0-5 years. The collected data were then statistically analyzed using a paired sample t-test in SPSS to determine whether the mean height difference before and after the *GOTASMIL* intervention was significant.

Table 8 Paired samples test output: height.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Weight_Week1- Weight_Week8	-3.33261	1.82295	.26878	-3.87396	-2.79126	-12.399	45	.000

Source: Results of SPSS Paired Sample, 2024.

The mean height difference between weeks 1 and 8 was -3.33 cm, indicating an average height increase of 3.33 cm after eight weeks of intervention. The standard deviation of differences was 1.82 cm, reflecting individual variation in growth responses—the Std. The Error Mean of 0.27 cm demonstrates a precise estimation of the mean height difference.

The t-test yielded t = -12.399 with degrees of freedom (df) 45, and $p<0.001$ (Sig. 2-tailed= 0.000). As the significance value was well below the 0.05 threshold, the mean height difference before and after intervention proved statistically highly significant. This confirms that nutritional package provision and family education in the *GOTASMIL* Program effectively stimulated linear growth in stunted children over the eight weeks.

Furthermore, the 95% confidence interval, ranging from -3.87 cm to -2.79 cm, did not include zero, thereby strengthening the conclusion of consistent, measurable changes in the intervention group. The negative difference values mathematically indicate improvement, as differences were calculated as (Week1-Week8).

Practically, an average 3.33 cm increase over eight weeks is particularly significant for stunted populations, where normal linear growth typically ranges from 0.5 to 1 cm per month. These results demonstrate growth acceleration exceeding baseline expectations, which is likely attributable to a focused nutritional intervention and rigorous program monitoring.

DISCUSSION

The assessment of children's nutritional status in this study was conducted based on the Child Anthropometric Standards, which serve as the official reference in Indonesia. These standards refer to the WHO Child Growth Standards for children aged 0–5 years and the WHO Reference 2007 for children aged 5–18 years, as regulated by the Regulation of the Minister of Health of the Republic of Indonesia Number 2 of 2020 concerning Child Anthropometric Standards (Indonesian Ministry of Health, 2020). The use of these anthropometric standards is essential to ensure consistency in classifying nutritional status, allowing measurement results to be comparable both nationally and globally.

In the global context, SDG 2: Zero Hunger integrates stunting into the development agenda, with a focus on adolescent nutrition as a strategy for intergenerational prevention. In Indonesia, nutrition policies—such as those implemented in South Kalimantan—demonstrate that mixed-method analysis enhances program effectiveness, reducing stunting through dedicated budget allocations. However, bureaucratic approaches often fail at the local level, necessitating innovations such as the Living Barn ("*Lumbung Hidup*") to achieve sustainable food security. The nutritional status of pregnant women has a direct influence on stunting, with specific interventions shown to increase birth weight and reduce stunting risk by 20–40%.

Knowledge of the First 1,000 Days of Life (1000 HPK) among adolescent girls remains low (only 32%), yet community-based education has been shown to increase preventive attitudes by up to 50%. Contextual factors such as sanitation and immunization are critical determinants, with a higher prevalence of severe stunting found among at-risk groups. Going forward, integrating digital monitoring technologies could improve the accuracy and sustainability of programs such as *GOTASMIL*, ensuring long-term reductions in stunting.

The research results indicate that the *GOTASMIL* Program intervention improved the nutritional status of stunted *baduta* in Bogor Regency. Providing nutritious food packages for eight weeks increased the weight and height of most targeted children. This finding aligns with the study by Sari et al. (2023), which demonstrated that food supplementation with animal protein sources, such as eggs and chicken, can increase protein and zinc intake, thereby improving the HAZ (Height-for-Age z-score) in stunted children. The study findings indicate that although the *GOTASMIL* Program achieved positive outcomes in half of the sample, gaps in program achievement remain and must be addressed through technical improvements and strengthened social support. Such refinements are expected to increase the proportion of stunted children who meet the minimum weight-gain criteria in subsequent program cycles.

The results of this research provide strong evidence that specific nutritional interventions, such as *GOTASMIL*, can produce significant effects on linear growth in stunted children within 2 months. However, the success experienced by the majority must be accompanied by an in-depth evaluation of cases that did not improve, to inform future adjustments to the composition of the nutritional package, accompaniment frequency, and field supervision. Accordingly, recommendations for the next phase include strengthening routine monthly height monitoring, improving technical socialization on package distribution, and implementing initial screenings for high-risk children to ensure more targeted interventions.

Baseline findings from this study also underscore the urgency of prioritized interventions: children in the "Severely Stunted" category require more intensive attention and monitoring—such as weekly anthropometric assessments—whereas those in the "Stunted" category may show faster improvement through optimized nutrient intake. These data will serve as a reference point for comparing shifts in z-scores and nutritional status classifications at week 8, enabling a comprehensive evaluation of the *GOTASMIL* Program's effectiveness.

Following the Bogor Regency Stunting Discussion Forum (May 14, 2024), the Foster Parents Movement for Stunted Children and Pregnant Women with Chronic Energy Deficiency (*GOTASMIL*) was launched as the main intervention. The program provides food packages (rice, chicken, eggs) for eight weeks to stunted children under two (*baduta*) and for sixteen weeks to pregnant women with Chronic Energy Deficiency (KEK), accompanied by anthropometric monitoring (Bogor Regency Government, 2024). This program is similar to other community-based interventions in Indonesia, where integrating nutrition gardens and education has been shown to improve Weight-for-Height Z-scores (WHZ) by 0.5–0.9 after 3–6 months. However, evaluations of *GOTASMIL* in Bogor remain limited, with policy convergence studies highlighting challenges in cross-sector collaboration. The effectiveness of similar nutritional interventions—such as education for pregnant women with short stature—has been shown to reduce the risk of gestational stunting by up to 40% through increased protein intake.

The implications of stunting extend beyond individual health, with Indonesia losing an estimated IDR 300 trillion annually due to reduced productivity. Longitudinal studies show a reduction in socioeconomic inequality in stunting between 2007 and 2014; however, urban-rural disparities persist, with factors such as maternal education contributing to a 15–25% reduction in prevalence. Prevention requires interprofessional collaboration (IPC), and IPC guidelines have been shown to improve program effectiveness by up to 30% through the integration of health and nutrition services. In Aceh and other regions, challenges include limited access to services; however, multisectoral interventions—such as those implemented in Bogor—have the potential to reduce prevalence by 5–10% annually.

However, the program's implementation in the field faced several challenges. First, out of 46 targeted children, six experienced weight loss, and two did not show significant improvement. Underlying health conditions and subclinical infections are likely to have influenced this condition. This finding is consistent with those of Fitriani et al. (2024), who emphasized that chronic infections can inhibit nutrient absorption by up to 40% and significantly reduce the effectiveness of nutritional interventions. Therefore, integrating nutrition services with curative health services is an urgent need so that children with special needs receive more comprehensive care.

Second, the phenomenon of food sharing, or the distribution of supplementary food packages within the family, also posed an obstacle. Food intended for the targeted child's exclusive consumption was often shared with other family members. This practice reduced the child's nutritional intake, thereby affecting the program's effectiveness. Wulandari and Setiawan (2024) noted a similar phenomenon in West Java, where 67% of food aid recipient families shared their rations due to economic pressures within their families. This confirms the need for distribution supervision and improved family nutritional literacy to ensure food aid is used as intended.

Third, family nutritional literacy remains a fundamental issue. A lack of understanding among parents about feeding patterns and nutritional intake among *baduta* often leads to suboptimal provision of supplementary food. Pratiwi et al. (2023) affirmed that only about 32% of mothers understand the principles of exclusive feeding for children aged 0–23 months. Therefore, enhancing family capacity through community-based nutrition education, for example, by involving health cadres or family mentors, is crucial to strengthening the intervention.

Furthermore, the eight-week intervention duration may not be sufficient to produce long-term impacts. A longitudinal study by Ramadhan et al. (2024) showed that significant improvement in WHZ (Weight-for-Height z-score) was observed only after nutritional interventions lasted at least 12 weeks. Thus, extending the duration of the *GOTASMIL* Program to cover the whole 1000 HPK period has the potential to yield more sustainable impacts on children's nutritional status.

Based on these findings, several strategic recommendations are proposed to enhance the program's effectiveness. First, integration between nutrition services and primary health services must be strengthened so that children with underlying health conditions receive comprehensive care. Second, a mechanism for supervising food distribution is needed to ensure that the targeted child actually receives the intended intake. Third, improving family nutritional literacy through community-based education is essential, enabling parents to independently manage stunting in their children. Fourth, extending the intervention duration to at least 6 months, or ideally until age 2, would be optimal for leveraging the 1000 HPK period.

With cross-sectoral support and sustained commitment from local governments, health workers, and the community, the *GOTASMIL* Program can be developed into an effective local intervention model for reducing stunting. The success of Bogor Regency in reducing stunting prevalence to 1.91% in 2024 demonstrates that interventions based on nutritious foods, combined with a multisectoral approach, can serve as a replicable best practice for other regions (West Java Health Office, 2024).

The limitation of this study lies in its analytical scope, which focuses solely on evaluating the effectiveness of the *GOTASMIL* Program among stunted children. The other target group—pregnant women with Chronic Energy Deficiency (CED/KEK)—could not be analyzed in depth due to constraints on study coverage and limited data availability during the implementation phase.

CONCLUSION

This research demonstrates that the *GOTASMIL* Program intervention significantly improved the nutritional status of stunted children in Bogor Regency. Providing nutritious food packages consisting of rice, chicken, and eggs over eight weeks increased the weight and height of most target children. This demonstrates that nutritional interventions based on local foods can be an effective strategy for accelerating reductions in stunting prevalence.

However, program implementation still faced several challenges, including children with underlying health conditions that hindered their response to the intervention, food sharing, which reduced the nutritional intake of the targets, and low family nutritional literacy. These factors indicate that the program's effectiveness is determined not only by the availability of nutritious food but also by health aspects, parenting practices, and the family's socio-economic conditions.

Therefore, the sustainability of the *GOTASMIL* Program should be directed toward integrating nutrition services into primary health care, strengthening community-based family nutrition literacy, ensuring proper supervision of food distribution to reach the intended beneficiaries, and extending the intervention duration to cover the entire First 1,000 Days of Life (1000 HPK) period. With cross-sectoral commitment and active community involvement, *GOTASMIL* has the potential to become an effective and sustainable local intervention model that

can be replicated in other regions as part of the national effort to accelerate stunting reduction. Further research is needed to analyze the effectiveness of the program's interventions in improving the nutritional status of all *GOTASMIL* target groups, particularly families at risk of stunting with pregnant women experiencing Chronic Energy Deficiency (CED/KEK), to enable early management of high-risk conditions such as low birth weight, which increases vulnerability to stunting.

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