

# Improving nutrition of underweight and stunting children through “DIGIDAU” innovation in Pesanggrahan District Health Centre



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## ABSTRACT

**Introduction:** The World Health Organization Nutrition Guidelines recommend that exclusive breastfeeding can be given until 6 months, continuing breastfeeding until 2 years of age, and adding complementary foods for their child. This Community Empowerment was held from May to July 2023 in the Pesanggrahan District to reduce Stunting rates. Nutrition Diary in Overcoming Stunting (DIGIDAU) is an innovation to improve toddler nutrition by recording 24-hour food recalls every day for 5 weeks by mothers of toddlers. To assess the impact of “DIGIDAU” on reducing the incidence of malnutrition & stunting in children under five years by recording dietary patterns and improving parenting knowledge in Pesanggrahan.

**Method:** A quantitative experimental research using a pre-experimental design study. A one-group pretest-posttest design was used. The experimental group received treatment using the “DIGIDAU”, where respondents’ nutritional status was assessed before (pretest) and after (posttest) the treatment. The respondents for this research were 20 toddlers living in Pesanggrahan who met the research criteria. Data including toddlers’ weight and height and parents’ knowledge were collected and analyzed using paired sample t-tests.

**Results:** Before the intervention, the respondents had poor knowledge around 17 mothers (85%). After the intervention, 20 mothers (100%) increased in knowledge. So that there was an impact of the counseling and training interventions on parents’ knowledge of parenting with P value = 0.00 (< 0.05). Meanwhile, by recording dietary patterns & weight monitoring, there were 4 toddlers who experienced an increase in weight status according to age (Weight/age) from Underweight to Normal Weight. During the 5 weeks of the program, there was an increase in weight and height.

**Conclusion:** The innovation of the Nutrition Diary in Overcoming Stunting “DIGIDAU” Program significantly increased the mother’s knowledge and the nutritional status of malnutrition and stunted toddlers.

**Keywords:** Stunted; Nutritional status; Toddlers; Parenting knowledge.

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## INTRODUCTION

The first 1000 days of a child’s life are crucial for proper growth and preventing diseases by providing adequate nutrition. Breastfeeding and complementary foods play significant roles in determining future health.<sup>1</sup> Nutritional guidelines in America and Europe recommend exclusive breastfeeding for the first six months and continuing until the baby’s first birthday, with complementary foods introduced after six months to meet nutritional needs and prevent deficiencies.<sup>2</sup> Proper nutrition during pregnancy and infancy

is essential for brain development, supporting cognitive, motor, and socio-emotional skills, while deficiencies can cause disruptions.<sup>3,4</sup>

Stunting is the most common malnutrition condition, affecting 144 million children under 5 globally in 2019. According to WHO, Indonesia had the third-highest stunting prevalence in Southeast Asia, with an average rate of 36.4% from 2005 to 2017.<sup>5,6</sup> Stunting means a child is too short for their age, wasting means too thin for their height, and underweight means low weight for their age. A z-score below two standard

deviations for height-for-age indicates stunting, for weight-for-height indicates wasting, and for weight-for-age indicates underweight.<sup>7,8</sup>

Indonesia had a high prevalence of stunting in 2022, with 21.6% of toddlers affected. The highest provincial rate was in East Nusa Tenggara at 35.3%. In DKI Jakarta, 14.8% of toddlers experienced stunting, with the highest prevalence in Kepulauan Seribu at 20.5%. South Jakarta recorded the lowest prevalence at 11.9%. In Pesanggrahan District, 20 toddlers were reported as stunted in May 2023.<sup>9</sup>

Stunting is primarily caused by poor

nutrition and infections, often linked to poverty, which limits access to nutritious food, clean water, and healthcare. Other factors include low maternal education, short maternal height, low BMI, low birth weight, and frequent diarrhea in children aged 6–24 months.<sup>10</sup> Malnutrition increases illness and death rates, delays physical and mental development, and creates economic burdens. It also impacts reproductive health, school performance, and work productivity, potentially resulting in a generation of poorly educated, unhealthy, and impoverished adults, ultimately hindering a country's economic growth.<sup>11,12</sup>

WHO and the Indonesian Association of Pediatricians (IDAI) recommend exclusive breastfeeding for the first six months, starting within one hour after birth, and continuing until 24 months. Complementary foods should be introduced at six months, or as early as four months if breast milk is insufficient and the baby is ready. These foods must meet the child's nutritional needs, be hygienically prepared, and given at the right times. From 6–8 months, solids should be given 2–3 times a day, increasing to 3–4 times daily from 9–24 months, with 1–2 snacks as needed. The food should become more solid as the child grows, starting with smooth porridge at 6 months and softer family foods by 12 months. By 12 months, children can eat the same foods as the family. A balanced diet is important to keep toddlers hydrated and prevent constipation.<sup>13,14</sup>

During early growth, children need more calories for development. Infants need about 100 kcal/kg/day, while toddlers aged 2 to 3 years need 1000 to 1400 kcal/day. Fat is essential for brain development and should not be restricted before age 1. For children aged 1 to 3, 45%–65% of energy should come from carbohydrates, 30%–40% from fats, and 5%–20% from protein. Added sugars should be avoided for children under 2 and limited for older kids.<sup>15</sup>

This study was conducted during the community service program of the Public Health Science co-assistant program at Universitas Trisakti from May to July 2023. Authors explored why the weight and height of stunted children in the

Pesanggrahan District Health Centre area remained difficult to improve despite receiving supplementary food. Interviews with stakeholders, including the nutrition program coordinator, community health cadres, and mothers of stunted children, revealed several issues. Children were not eating the supplementary food provided because parents lacked knowledge of proper feeding practices, such as avoiding snacks before meals, and prioritized fullness over nutritional quality.

Based on interview findings and reviewed references, the researchers designed the *Diari Gizi Dalam Atasi Stunting* (DIGIDAU). This program monitors and evaluates toddler food intake through the DIGIDAU book, which includes consultations via WhatsApp and weekly evaluations of anthropometric measurements and nutritional diary results. The diary contains educational materials on feeding toddlers, a food-recall sheet, and weekly nutritional status records to be completed by the mothers, with support from community health cadres and researchers.

The DIGIDAU program improves toddler nutrition by having mothers track daily food intake for five weeks, which trained health workers review alongside growth measurements to assess needs. This study evaluates DIGIDAU's impact on improving weight and height in underweight and stunted toddlers in the Pesanggrahan Health Center area. One of the studies that authors refer to is a study by Sharma et al that conducted several food recalls for infants in Baltimore and they found that formula milk was more commonly used than breast milk and that sugary and fatty foods increased with age, raising obesity risks. This result supports the Growing Leaps and Bounds program, which aims to prevent early obesity.<sup>16</sup>

## METHOD

### Research design

A quantitative experimental research using a pre-experimental design study. One group pretest-posttest design was used. The experimental group received treatment using the “DIGIDAU” innovation where respondents were assessed by their daily nutrition status before being given treatment, the toddler's

nutritional status is first checked (Pretest) and after being given treatment, the nutritional status was also checked again (posttest).

The six-week study, conducted from May 15 to June 30, 2023, had two phases: preparation (May 15–25) with stakeholder interviews and intervention setup, and implementation (May 26–June 30) of the DIGIDAU program. The DIGIDAU book, developed on May 22 with input from nutrition experts, includes a five-week food recall, stunting information, guidelines for complementary feeding, and snack recipes.

On May 26, mothers, caregivers, and health cadres were trained in feeding practices and program details. Knowledge and toddlers' nutritional status were assessed before the intervention. Daily food intake was tracked using the DIGIDAU book, monitored by the Nutrition Awareness Cadre Group, with weekly evaluations by researchers. Nutritional status and meal patterns were reviewed every Friday, with the final measurement on June 30 as a post-test.

This study was part of a community service program by the Public Health co-assistant program at Universitas Trisakti, approved and supervised by the university and Pesanggrahan Health Center. Participants gave informed consent after understanding the program's purpose, procedures, risks, and benefits. Data confidentiality was maintained through anonymization and secure storage.

### Research subject

The sampling method in this study is consecutive sampling. All stunted toddlers in Pesanggrahan District were included in the research sample with the following criteria:

1. Age has not reached 5 years (60 months) during the research period
2. Included in one of the nutritional categories: stunting, wasting, underweight
3. Included in risk of stunting
4. Willing to be given intervention for 5 weeks

After applying the inclusion criteria, a total of 20 respondents participated in the study.

### Measuring instrument

The study used the elitech baby scale for measuring weight and elitech infantometer dan stadiometer for measuring height.

### Data analysis

The Paired Sample T-Test was conducted by IBM SPSS Statistics Version 25 for Windows. This hypothesis testing analysis is to prove whether there is an influence between monitoring daily nutritional adequacy through the “DIGIDAU” innovation and improving toddler nutrition. The relationship between variables is considered meaningful (significant) if ( $\alpha$ ) is  $\leq 0.05$ .

## RESULTS

Among the 20 children under five years old as a respondents in this study, results were obtained which were grouped into sociodemographic characteristics, child history, nutritional status of toddlers, anthropometric calculations of toddlers before and after intervention, differences in nutritional status of toddlers before and after intervention, and monitoring of toddlers' daily eating.

### Sociodemographic Characteristics of Respondents

As shown in the table above, among the 20 toddlers, 45% were boys and 55% were girls. There were no toddlers aged 0-12 months, with most (40%) in the 37-48 month age range. Most parents (90%) had a secondary education, and 80% earned below the minimum wage. Additionally, 95% of parents were legally married, and 70% of families had two or fewer children.

### Child History

History taking of mother's toddler taken by anamnesis, starting from pregnancy, birth, to growth and development history. The child's history can be seen in [Table 2](#) below.

[Table 2](#) summarizes the health conditions during pregnancy for 20 respondents. 40% had anemia, 20% had comorbid diseases, 5% had infectious diseases, and 15% reported smoking or alcohol use. Additionally, 15% experienced malnutrition or chronic energy deficiency. Most respondents (85%) received at least four antenatal care visits, and all took

**Table 1. Sociodemographic Characteristics of Respondents**

Variable	Frequency (n = 20)	Percentage (%)
<b>Toddler Gender</b>		
Boy	9	45
Girl	11	55
<b>Toddler Age Group</b>		
0-12 months	0	0
13 – 24 months	3	15
25 – 36 months	4	20
37 – 48 months	8	40
49 – 60 months	5	25
<b>Parental Education</b>		
Primary	1	5
Secondary	18	90
Tertiary	1	5
<b>Family Income</b>		
< Minimum wage	16	80
≥ Minimum wage	4	20
<b>Parents' Marital Status</b>		
Marry	19	95
Divorced	1	5
<b>Number of Children in the Family</b>		
≤2 people	14	70
> 2 people	6	30

at least 90 iron supplements. Regarding births, 75% had term babies, 15% faced complications, 75% had normal deliveries, and 25% had cesarean sections. 70% were assisted by doctors and 30% by midwives. At birth, 70% of babies had normal weight, 30% had low birth weight, 45% had normal height, and 55% had short height. Finally, 80% of babies received complete immunizations.

### Anthropometric Examination of Toddlers Before and After

Each toddler in the study had their weight and height measured before and after the intervention. The comparison of their weight and height is shown in [Table 3](#). Over the 5-week DIGIDAU intervention, most toddlers showed improvements. Of the 20 toddlers, only 1 had no weight improvement, but all showed an increase in height, with the greatest growth being 2 cm.

Twenty toddlers aged 20 to 59 months were observed, showing a strong positive correlation between pre- and post-intervention measurements for both weight and height, as seen in [Table 4](#). Most toddlers, regardless of gender, gained weight and height after the intervention. On average, weight increased by 0.405

kg, ranging from 0 to 1 kg, and height increased by 0.865 cm, with increases ranging from 0.2 to 2 cm.

### Assessment of Toddler Nutritional Status Before and After Intervention

Assessment of the nutritional status of toddlers is carried out by comparing body weight/age and height/age. The nutritional status of toddlers before and after the intervention can be seen in [Table 5](#) below.

The table shows toddlers' nutritional status before and after the intervention. Before the intervention, none were in the Normal Weight and Normal Height categories, with most being either Underweight and Stunted (35%) or Severe Underweight and Severe Stunted (35%). After the intervention, improvements were seen: the Normal Weight and Stunted category rose to 20%, while the Underweight and Stunted category dropped to 20%. However, most toddlers (35%) remained in the Severe Underweight and Severe Stunted categories, which stayed the same.

### Monitoring Toddlers' Daily Food Via DIGIDAU

Each participating mother in the DIGIDAU program recorded her toddler's food

**Table 2. Child History**

Variable	Frequency (n = 20)	Percentage (%)
<b>History of anemia during pregnancy</b>		
Yes	8	40
No	12	60
<b>History of comorbid diseases during pregnancy</b>		
Yes	4	20
No	16	80
<b>History of contracting an infectious disease during pregnancy</b>		
Yes	1	5
No	19	95
<b>History of smoking and alcohol consumption during pregnancy</b>		
Yes	3	15
No	17	85
<b>History of malnutrition / CED during pregnancy</b>		
Yes	3	95
No	17	5
<b>History of ANC during pregnancy</b>		
≥ 6 times	17	85
< 6 times	3	15
<b>Mothers Take a Minimum of 90 Iron Supplements During Pregnancy</b>		
Yes	20	100
No	0	0
<b>Birth of a Full-term Child (38 – 42 Weeks)</b>		
Yes	15	75
No	5	25
<b>Complications During Childbirth</b>		
Yes	3	15
No	17	85
<b>Delivery Method</b>		
Normal	15	75
<i>Sectio Caesarea</i>	5	25
<b>Childbirth Assistant</b>		
Doctor	14	70
Midwife	6	30
<b>Birth Weight</b>		
Normal	14	70
Low Birth Weight	6	30
<b>Birth Height</b>		
Normal Stature	9	45
Short Stature	11	55
<b>Basic Immunization History</b>		
Complete	16	80
Incomplete	4	20

intake over 24 hours. Researchers checked these records weekly and calculated the toddlers' daily calorie intake, using standardized measuring tools to avoid errors. The results of monitoring toddlers' average daily calories, eating frequency and eating variety during the 5 weeks of intervention can be seen in [Table 5](#) below.

Monitoring results show variations in toddlers' daily food intake. Of the 20 toddlers who were observed, the average number of daily calories consumed ranged from 800 to 1600 calories. Most toddlers (in the 70% range) have a frequency of eating that has reached 3 times a day or more. Variety in food also varies with

around 60% of toddlers consuming a variety of foods. If we look at week-to-week trends, most toddlers consume calories according to the RDA starting in the third week and are stable until the end of the intervention in the fifth week. Figure below is the documentation of the intervention process.

**Table 3.** Comparison of Toddlers' Body Weight and Height Before and After Intervention

Toddler	Sex	Age (month)	Toddler's Weight (in kilograms)			Toddler's Height (in centimeters)						
			Before	Weight Status	After	Enhancement	Before	High Status	After	High Status	Enhancement	
1	Boy	59	12.02	Underweight	12.05	Underweight	00.03	96	Stunted	97	Stunted	1
2	Girl	56	10.04	Severe Underweight	10.08	Severe	00.04	90	Severe Stunted	91	Severe Stunted	1
3	Girl	48	10.07	Underweight	11.04	Underweight	00.07	89	Stunted	89.05.00	Stunted	00.05
4	Girl	44	10.09	Underweight	11.09	Normal Weight	1	90.05.00	Stunted	91	Stunted	00.05
5	Boy	54	11.04	Severe Underweight	11.08	Severe	00.04	92.05.00	Severe Stunted	93	Severe Stunted	00.05
6	Boy	45	10.08	Underweight	11	Normal Weight	00.02	92	Stunted	93	Stunted	1
7	Girl	44	11	Underweight	11.07	Normal Weight	00.07	91.05.00	Stunted	92.05.00	Stunted	1
8	Boy	43	11.02	Underweight	11.05	Underweight	00.03	91	Stunted	93	Stunted	2
9	Boy	16	07.07	Underweight	08.04	Normal Weight	00.07	69	Severe Stunted	71	Severe Stunted	2
10	Boy	41	11	Underweight	11.07	Underweight	00.07	87	Severe Stunted	87.02.00	Severe Stunted	00.02
11	Girl	48	10	Severe Underweight	10.03	Severe	00.03	88	Severe Stunted	90	Severe Stunted	2
12	Girl	20	07.09	Underweight	8	Underweight	00.01	75	Stunted	76	Stunted	1
13	Boy	21	09.03	Normal Weight	09.03	Normal Weight	0	78	Stunted	78.08.00	Stunted	00.08
14	Girl	25	07.05	Severe Underweight	8	Severe	00.05	77	Severe Stunted	77.05.00	Severe Stunted	00.05
15	Boy	45	09.07	Severe Underweight	10.01	Severe	00.04	85.05.00	Severe Stunted	85.09.00	Severe Stunted	00.04
16	Girl	26	08.01	Severe Underweight	08.05	Severe	00.04	77	Severe Stunted	77.09.00	Severe Stunted	00.09
17	Girl	59	11.01	Severe Underweight	11.07	Severe	00.06	95.06.00	Stunted	96.04.00	Stunted	00.08
18	Boy	38	10.05	Underweight	10.07	Underweight	00.02	85	Severe Stunted	85.05.00	Severe Stunted	00.05
19	Girl	43	09.09	Severe Underweight	09.09	Severe	00.00	87	Stunted	87.05.00	Stunted	00.05
20	Girl	32	08.06	Severe Underweight	09.03	Severe	00.07	79	Severe Stunted	79.02.00	Severe Stunted	00.02

### Improving knowledge of toddler feeding among mothers of toddlers and cadres

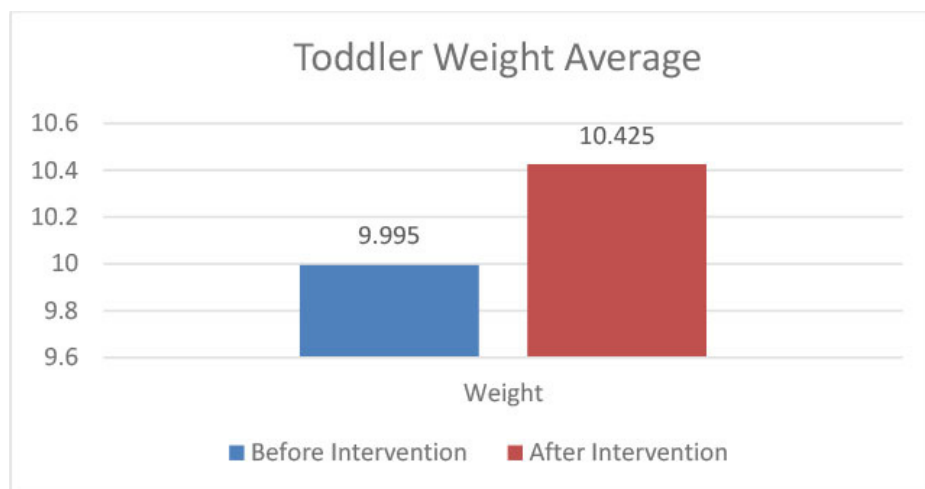
An assessment of the level of knowledge of toddler feeding was conducted before and after health promotion was carried out for 20 mothers of toddlers who underwent the DIGIDAU intervention. Based on the table above, most mothers had poor knowledge before the intervention, as many as 17 mothers (85%), and after the intervention, all mothers with stunted toddlers experienced an increase in knowledge to 20 mothers (100%). The results of the Wilcoxon test showed a P value <0.05, where there was an effect of counseling and training interventions on the knowledge of mothers with stunted toddlers. The most questions answered incorrectly were about toddler meal scheduling and feeding patterns, only 1 mother answered correctly.

### DISCUSSION

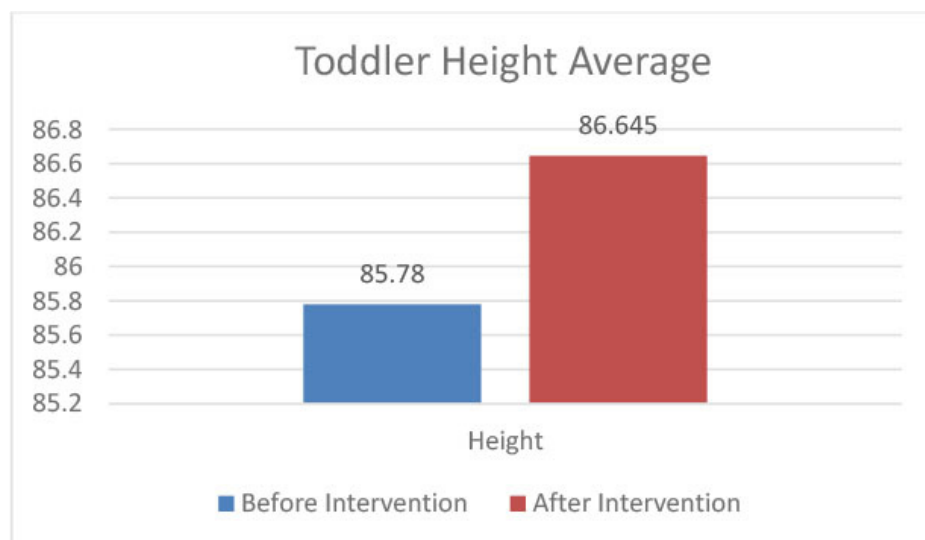
The results of this study demonstrate that the DIGIDAU program significantly improved both the nutritional status of malnourished and stunted toddlers and the knowledge of mothers regarding proper feeding practices. This aligns with previous research that emphasizes the importance of community-based interventions and education in addressing malnutrition and stunting in children. A significant improvement in mothers' knowledge was observed, where 85% of the mothers initially had poor understanding of child nutrition, but after the intervention, 100% of the mothers showed improved understanding. The use of mobile applications or technology-based approaches can effectively enhance parents' and healthcare workers' knowledge, which in turn improves child growth outcomes.<sup>17</sup>

Furthermore, the study noted a notable increase in children's weight and height after the five-week intervention period. On average, toddlers gained 0.405 kilograms in weight and 0.865 centimeters in height. These results reflect the impact of daily food monitoring through the DIGIDAU nutrition diary. Regular tracking of infant and toddler dietary intake can help identify nutritional deficiencies and support healthier feeding





**Figure 1.** Toddler weight average before and after intervention of “DIGIDAU”.



**Figure 2.** Toddler height average before and after intervention of “DIGIDAU”.

**Table 4.** Paired sample correlation test

	N	Correlation	Sig
Weight of Pre & Post	20	0.982	<.001
Height of Pre & Post	20	0.997	<.001

**Table 5.** Nutritional Status of Toddlers Before and After Intervention

Nutritional Status of Toddlers	Before Intervention	After Intervention
Normal Weight and Normal Stature	0 (0%)	0 (0%)
Normal Weight and Stunted	1 (5%)	4 (20%)
Normal Weight and Severe Stunted	1 (5%)	1 (5%)
Underweight and Normal Stature	0 (0%)	0 (0%)
Underweight and Stunted	7 (35%)	4 (20%)
Underweight and Severely Stunted	2 (10%)	2 (10%)
Severe Underweight and Normal Stature	0 (0%)	0 (0%)
Severe Underweight and Stunted	2 (10%)	2 (10%)
Severe Underweight and Severe Stunted	7 (35%)	7 (35%)

practices.<sup>16</sup>

The success of the DIGIDAU program also highlights the importance of

continuous dietary monitoring. Consistent monitoring during the critical first 1,000 days of life is essential to ensure

optimal growth and prevent stunting.<sup>5</sup> The DIGIDAU innovation allowed mothers and healthcare workers to closely track and adjust children's nutrition, leading to tangible improvements in health outcomes.

However, despite the progress made, many of the toddlers remained categorized as underweight and stunted after the intervention. Around 35% of toddlers were still in the severely underweight and severely stunted categories. This indicates that while short-term interventions can yield positive results, long-term strategies may be required to sustain and further improve child nutritional outcomes. Access to nutritious food and adequate healthcare services, particularly for low-income families (80% of the study respondents), remains a significant challenge that must be addressed.

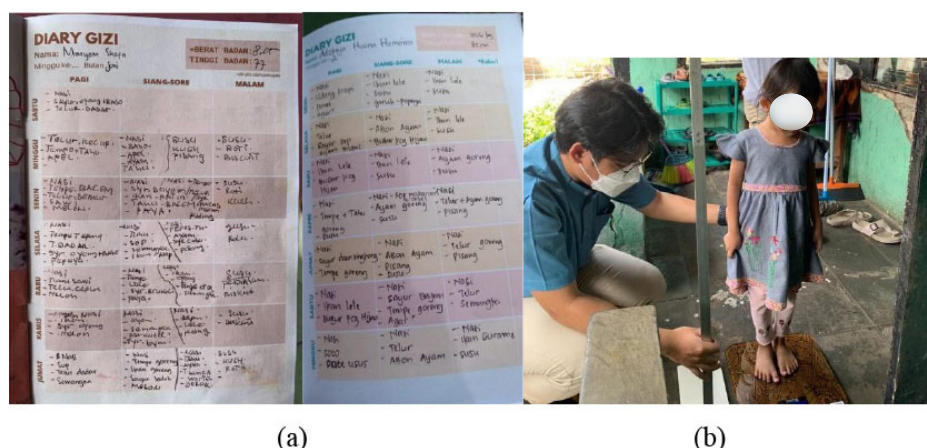
The DIGIDAU program proved effective in providing real-time solutions for monitoring and improving children's nutrition through the empowerment and education of mothers. For larger-scale implementation, however, there is a need to digitize the DIGIDAU program to enable widespread and continuous monitoring. Technology-based solutions can enhance the efficiency of nutritional interventions and allow for broader data collection and analysis.<sup>1</sup>

## CONCLUSION

The DIGIDAU program significantly improved mothers' knowledge and the nutritional status of malnourished and stunted toddlers in South Jakarta. It supports stunting eradication by daily monitoring toddlers' food intake, regularly checking their health, and providing education and support to health workers. Effective communication among mothers, health center staff, and researchers is crucial for success. While monitoring needs to be gradual in stunting-affected areas, digitizing DIGIDAU into software will enable widespread monitoring and provide valuable data for policies aimed at reducing stunting.

## ACKNOWLEDGMENT

The authors are grateful to the Pesanggrahan District Health Centre



**Figure 3.** (a) DIGIDAU Food Recall Book. (b) Anthropometric Measurement.

and children's families who participated, supported, and expressed their enthusiasm during the program.

## CONFLICT OF INTEREST

The authors declare no conflict of interest. The study was self-funded and supervised by the Department of Public Health, Universitas Trisakti. Informed consent was obtained from all participants prior to their inclusion in the study. They were provided with information about the purpose, risks, and benefits of the study.

## AUTHOR CONTRIBUTION

The first author designed the experimental study and conducted the intervention with assistance from the second author, under the supervision of the third and fifth authors for the fidelity of a trial to the protocol. The third, fourth, and remaining authors were responsible for data and statistical analysis, and manuscript writing.

## REFERENCE

- Kozioł-Kozakowska A. Adequate nutrition in early childhood. *Children* [Internet] 2023;10:1155. Available from: <https://doi.org/10.3390/children10071155>
- Fewtrell M, Bronsky J, Campoy C, Domellöf M, Embleton N, Mis NF, et al. Complementary Feeding. *Journal of Pediatric Gastroenterology and Nutrition* [Internet] 2016;64:119–32. Available from: <https://doi.org/10.1097/mpg.0000000000001454>
- Nurliyana AR, Shariff ZM, Taib MNM, Gan WY, Tan KA. Early nutrition, growth and cognitive development of infants from birth to 2 years in Malaysia: a study protocol. *BMC Pediatrics* [Internet] 2016;16. Available from: <https://doi.org/10.1186/s12887-016-0700-0>
- Cusick SE, Georgieff MK. The Role of Nutrition in Brain Development: The Golden Opportunity of the “First 1000 Days.” *The Journal of Pediatrics* [Internet] 2016;175:16–21. Available from: <https://doi.org/10.1016/j.jpeds.2016.05.013>
- Liu J, Sun J, Huang J, Huo J. Prevalence of Malnutrition and Associated Factors of Stunting among 6–23-Month-Old Infants in Central Rural China in 2019. *International Journal of Environmental Research and Public Health* [Internet] 2021;18:8165. Available from: <https://doi.org/10.3390/ijerph18158165>
- Yani DI, Rahayuwati L, Sari CWM, Komariah M, Fauziah SR. Family Household Characteristics and Stunting: An Update Scoping Review. *Nutrients* [Internet] 2023;15:233. Available from: <https://doi.org/10.3390/nu15010233>
- De Onis M, Branca F. Childhood stunting: a global perspective. *Maternal and Child Nutrition* [Internet] 2016;12:12–26. Available from: <https://doi.org/10.1111/mcn.12231>
- Suratri MAL, Putro G, Rachmat B, Nurhayati N, Ristrini N, Pracoyo NE, et al. Risk Factors for Stunting among Children under Five Years in the Province of East Nusa Tenggara (NTT), Indonesia. *International Journal of Environmental Research and Public Health* [Internet] 2023;20:1640. Available from: <https://doi.org/10.3390/ijerph20021640>
- Badan Kebijakan Pembangunan Kesehatan Kementerian Kesehatan Republik Indonesia. *Buku Saku hasil Survei Status Gizi Indonesia (SSGI) 2022*. 2022
- Berhe K, Seid O, Gebremariam Y, Berhe A, Etsay N. Risk factors of stunting (chronic undernutrition) of children aged 6 to 24 months in Mekelle City, Tigray Region, North Ethiopia: An unmatched case-control study. *PLoS ONE* [Internet] 2019;14:e0217736. Available from: <https://doi.org/10.1371/journal.pone.0217736>
- Ekhoulentale M, Barrow A, Ekhoulentale CE, Tudeme G. Impact of stunting on early childhood cognitive development in Benin: evidence from Demographic and Health Survey. *Egyptian Pediatric Association Gazette* [Internet] 2020;68. Available from: <https://doi.org/10.1186/s43054-020-00043-x>
- Sjarif, Yuliarti, Lestari, Sidiartha, Nasar, Mexitalia. *Rekomendasi praktik pemberian makan berbasis bukti pada bayi dan batita di Indonesia untuk mencegah malnutrisi*. 1st ed. Unit Kerja Koordinasi Nutrisi dan Penyakit Metabolik Ikatan Dokter Anak Indonesia; 2015
- Benelam B, Gibson-Moore H, Stanner S. Healthy eating for 1–3 year-olds: A food-based guide. *Nutrition Bulletin* [Internet] 2015;40:107–17. Available from: <https://doi.org/10.1111/mbu.12134>
- Faizan U, Rouster AS. *Nutrition and Hydration Requirements In Children and Adults* [Internet]. StatPearls - NCBI Bookshelf2023; Available from: <https://www.ncbi.nlm.nih.gov/books/NBK562207/>
- Patel JK, Rouster AS. *Infant Nutrition Requirements and Options* [Internet]. StatPearls - NCBI Bookshelf2023; Available from: <https://www.ncbi.nlm.nih.gov/books/NBK560758/>
- Sharma S, Kolahdooz F, Butler L, Budd N, Rushovich B, Mukhina GL, et al. Assessing dietary intake among infants and toddlers 0–24 months of age in Baltimore, Maryland, USA. *Nutrition Journal* [Internet] 2013;12. Available from: <https://doi.org/10.1186/1475-2891-12-52>
- Kustiawan TC, Nadhiroh SR, Ramli R, Butryee C. Use of mobile app to monitoring growth outcome of children: A systematic literature review. *Digital Health* [Internet] 2022;8:205520762211386. Available from: <https://doi.org/10.1177/20552076221138641>



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**Table 6. Monitoring Toddlers' Daily Food Using Digidau**

Toddler	Sex	Toddler Age	RDA / Day	Average Daily Calories					Meal Frequency					Eating Variations				
				M-1	M-2	M-3	M-4	M-5	M-1	M-2	M-3	M-4	M-5	M-1	M-2	M-3	M-4	M-5
1	Boy	60	1400	883	993	1430.7	1539.4	1667.2	1	1	2	2	2	1	2	1	2	1
2	Girl	56	1400	930	890	1402.6	1430.7	1527.1	1	2	1	1	3	2	2	1	1	1
3	Girl	48	1400	1243	1135	1251	1477	1654	2	2	3	2	3	1	1	1	1	1
4	Girl	44	1350	1198	958	1281	1394.3	1587.8	2	1	1	2	3	1	1	1	1	1
5	Boy	54	1400	982	1176.4	1674.1	1467.2	1549.3	2	2	2	3	2	2	2	1	1	2
6	Boy	45	1350	933	1289	1148.2	1438	1472.5	1	2	2	3	2	1	1	1	1	1
7	Girl	44	1400	1121.3	1265	1330.7	1372.8	1417.4	2	1	3	2	3	1	1	2	1	1
8	Boy	43	1400	971.5	1064	1151	1366.1	1496.3	1	2	2	3	3	2	1	1	1	1
9	Boy	16	1350	829	991.2	1243.2	1157	1352	1	1	2	2	3	2	2	1	1	2
10	Boy	41	1400	994	1091.2	1287.1	1452.4	1581.1	2	1	2	2	2	2	1	1	2	1
11	Girl	48	1400	1103.5	991	1393.1	1435	1541	1	1	1	2	2	2	2	2	2	1
12	Girl	20	1350	1240	1051	1351	1364	1437	1	1	2	2	2	2	1	1	1	1
13	Boy	21	1350	802	973	1265	1288	1301	2	1	2	2	3	2	1	1	2	2
14	Girl	25	1350	992	1021	1216	1392	1473	1	1	1	1	2	2	2	2	1	2
15	Boy	45	1400	1250	1172	1361	1472	1531	1	2	2	3	2	1	1	2	1	1
16	Girl	26	1350	920.5	1143	1255	1340	1305.2	1	1	2	3	3	2	1	1	2	1
17	Girl	59	1400	1208	1372	1493	1562	1559	1	2	3	2	2	1	1	1	1	1
18	Boy	38	1400	1037	1184	1269	1397	1352.5	1	1	1	2	2	2	2	1	2	1
19	Girl	43	1400	1273	1134	1322	1352	1421	2	1	2	1	2	2	1	1	1	1
20	Girl	32	1350	993	1129	1287	1370	1395	1	1	2	1	2	1	2	1	1	1

Table description:

Meal frequency:

1 = &lt; 3x

2 = 3 x

3 = 4 – 5 x (main meal + snack/interlude)

Meal variety:

1 = varied

2 = does not vary



**Table 7.** Mother Knowledge of Toddlers Before and After Intervention

Mother Knowledge	Before intervention		After Intervention		P Value
	Frequency	Presentation	Frequency	Presentation	
Good	3	15%	20	100%	<0.05
Improper	17	85%	0	0%	0.00



**Figure 4.** Cadres and mother of toddlers training for healthy food preparation.