



Balanced Nutritious Staple Foods as Spesific Interventions for Stunting Children

Muhammad Ridho Nugroho¹, Erwin Armeidi², Fergus Humsi³

^{1,2,3}Dinas Kesehatan Kota Lubuklinggau

Lubuklinggau, Indonesia

^{1*}muhammad.ridho74@ui.ac.id

²erwinllg@gmail.com

³firgushumsi76@gmail.com

Abstract

Efforts to reduce stunting require nutrition interventions that are carried out in an integrated and integrated manner, including specific and sensitive nutrition interventions. Specific interventions include providing balanced nutritional staple food to stunting toddlers. The sample in this study were 30 stunted toddlers in the Simpang Periuk Health Center working area with the type of intervention, namely providing balanced nutritional staple food for 90 days. The method used in this study uses an experimental design with a pre and post-test approach without control. The statistical test used was the paired sample test by comparing the nutritional status of toddlers before and after intervention. This research was completed in December 2022. The results showed a p-value of 0.000 (<.05), indicating that there was a significant difference in toddler height before and after the intervention was given, so it can also be concluded that the provision of balanced nutritious staple food interventions for 90 days can increase the height of toddlers thereby reducing the stunting rate in the target toddlers.

Keywords: *Balanced Nutritious Staple Foods, Spesific Intervention, Stunting Children*

A. Introduction

Presidential Regulation Number 72 of 2021 concerning the Acceleration of Stunting Reduction that is holistic, integrative and of good quality through coordination, synergy and synchronization among stakeholders. This Presidential Regulation is a substitute for Presidential Regulation Number 42 of 2013 concerning the National Movement to Accelerate Nutrition Improvement. The Presidential Decree contains reference that must be achieved by related parties in implementing the accelerated reduction of stunting. Therefore, to be able to properly carry out the mandate of this Presidential Decree, the relevant Ministries/Institutions must seriously carry out their duties according to their respective authorities.

Stunting can be a predictor of low quality human resources that affect the productivity and economic growth of a nation, so that prevention and control of stunting is very important. Stunting is a condition where children fail to thrive (body and brain growth) due to prolonged malnutrition. Thus, children are shorter or have short stature than normal children of their age and have delays in thinking. Generally caused by food intake that is not in accordance with nutritional needs [1]. Stunting in toddlers needs special attention because it can cause delays in physical growth, mental development and health status in children [2]. When children consume enough energy, they will grow and develop in accordance with their age, but when it does the nutritional state of the child would be affected by insufficient energy intake during childhood. Rapid growth in early childhood is a characteristic (growth spurt). It's crucial that children get the necessary amount of energy. Carbohydrates, lipids, and proteins are examples of macronutrients from which the energy is derived. The most significant source of energy for the body is carbohydrate. All body tissues, especially the brain, which typically employs glucose as an energy source for cell activity, rely on carbohydrates for energy [3].

Stunting is associated with an increased risk of morbidity and mortality, decreasing physical capacity, developmental and functional disorders of children's motor and mental conditions. Effort has been carried out by the Government through the Integrated Health Center, however not optimal because it does not involve all aspects of society. Cadres and traditional birth attendants is an important part of society that is strategic enough to be involved in this activity, because it is very close to the mother and the community

[4]. Stunting in children is also related to increased susceptibility of children to diseases, both infectious diseases and diseases non-communicable diseases (NCD) and an increased risk of overweight and obesity. overweight state and long-term obesity can increase the risk of degenerative diseases. Stunting case in children can be used as a predictor of the low quality of a country's human resources. The state of stunting causes poor cognitive abilities, low productivity, and the increased risk of disease results in long-term losses to the economy Indonesia [5].

Specific nutrition interventions are activities aimed directly at the target group namely toddlers, pregnant women, young women and other [6]. The Lancet series Mother and Child states that specific nutrition interventions have been shown to work reduce stunting by one third of the prevalence in the world, namely intervention through supplementation and fortification, support exclusive breastfeeding, Counseling about children's diet, medication for acute malnutrition and treatment of infections [7].

In the research of Setiawan et al., it is known that the variable level of energy intake has a significant value of $p = 0.001$ ($OR = 7.5$), which means that the level of energy intake is related to the incidence of stunting in children aged 24-59 months [8]. In the study of Aini et al., it is also known that the energy intake level variable is related to the incidence of stunting in children aged 24-59 months with a value of $p = 0.001$ ($OR = 1.288$) [9].

Based on the findings of the research mentioned above, this study carried out an intervention by giving stunting toddlers 90 days' worth of balanced nutritional staple food to see how their nutritional status was affected by their dietary intake.

B. Research Methods

The method used in this research is experimental research with the one group pretest and posttest design method. The number of samples was 30 stunting toddlers in the working area of the Simpang Periuk Lubuklinggau Health Center. In this case the variable that was carried out by the initial test was the nutritional status of stunting toddlers before being given the intervention, then the intervention was given in the form of a balanced nutritional staple food containing predetermined nutritional values for 90 days. After 90 days, a final test was carried out by measuring the nutritional status of the toddler at the end of the intervention. Then a Paired Sample T Test statistical test was carried out to see the level of effectiveness of the intervention program that had been given. The implementation time starts from September 26 to December 24, 2022.

C. Result and Discussion

1. Result

The form of intervention given to 30 targeted under-five samples was in the form of balanced nutritious staple food dishes which had been carried out by analyzing the nutritional value of servings using the Nutrisurvey application by the Indonesian Nutritionists Professional Organization (PERSAGI) DPC Lubuklinggau City with the nutritional content values as follows:

Table 1. Nutritional Value of Intervention Products

Nutritional Value	
Calorie	350 Cal
Fat	15 gr
Protein	7 gr
Carbohydrate	45 gr

The physical form of the intervention product is a composition consisting of rice (staple food), side dishes (animal and vegetable protein), vegetables and fruit (vitamins and minerals) and milk as a complement to the nutritional needs of infants, as can be seen in the following figure:

ABDIGERMAS

Jurnal Ilmiah Pengabdian Kepada Masyarakat Bidang Kesehatan



Figure 1. Balanced Nutritious Staple Foods

a. The Results of Measuring Nutritional Status Before and After The Intervention Are Given

Before giving the toddler intervention, first look at the nutritional status of height/age using primary data taken from the e-PPGBM application data on weighing data in September, while the results are as follows:

Table 2. Results of Measurement of Nutritional Status Before Intervention

Sample	Height	Weight	Z Score	Nutritional Status
1	73	6	-4,01	Severely Stunting
2	79	8,2	-5,08	Severely Stunting
3	83	10,1	-2,37	Stunting
4	76	9	-3,08	Severely Stunting
5	77.5	9,2	-3,02	Severely Stunting
6	74	9	-4,23	Severely Stunting
7	78	8,3	-3,48	Severely Stunting
8	82	10,2	-2,44	Stunting
9	80.5	10,5	-2,21	Stunting
10	76	8,6	-3,08	Severely Stunting
11	76	8	-3,72	Severely Stunting
12	83	10,5	-2,34	Stunting
13	82	11	-2,07	Stunting
14	82	9	-3,3	Severely Stunting
15	80	9	-2,08	Pendek
16	80	9,3	-3,07	Severely Stunting
17	82	10,3	-2,73	Stunting
18	85	13	-2,01	Stunting
19	89	12,5	-2,46	Stunting
20	80	12	-2,41	Stunting
21	78.5	11	-3,98	Severely Stunting
22	80	8,3	-3,63	Severely Stunting
23	77	9	-2,53	Stunting
24	82	9,4	-2,94	Stunting
25	67	6,5	-5,84	Severely Stunting
26	84	11	-2,18	Stunting
27	81	9,7	-2,4	Stunting
28	79	9,2	-2,86	Stunting
29	84	12	-3,5	Severely Stunting
30	88	12,1	-2,05	Stunting

The measurement of the nutritional status of toddlers was carried out before the intervention was given, namely in September 2022, the data was obtained from the weighing results of the posyandu which had been entered into the e-PPGBM application. From the results of the table above it is known that the number

ABDIGERMAS

Jurnal Ilmiah Pengabdian Kepada Masyarakat Bidang Kesehatan

of toddlers who have severely stunting nutritional status is 14 toddlers (46.7%) and those who have stunting nutritional status are 16 toddlers (53.3%).

Table 3. Results of Measurement of Nutritional Status After Intervention

Sample	Height	Weight	Z Score	Nutritional Status
1	82	9.5	-4.81	Severely Stunting
2	77.5	7.3	-3.4	Severely Stunting
3	83.5	10.3	-2.91	Stunting
4	81.5	10	-2.44	Stunting
5	84	10.5	-2.05	Stunting
6	81	11	-3.12	Severely Stunting
7	78	9.5	-4.21	Severely Stunting
8	84.5	10.5	-2.46	Stunting
9	87	11	-1.17	Normal
10	85	10.2	-1.88	Normal
11	84	10	-2.79	Stunting
12	90	12.5	-1.58	Normal
13	89	14	-1.57	Normal
14	87	11	-3.02	Severely Stunting
15	85.5	11	-1.91	Normal
16	82	10	-2.61	Stunting
17	86	11.6	-0.89	Normal
18	86	12.5	-2.42	Stunting
19	95	12.4	-1.47	Normal
20	88.5	12.5	-0.78	Normal
21	84	10.5	-3.1	Severely Stunting
22	83	9	-3.42	Severely Stunting
23	84	9.8	-1.98	Normal
24	87	10	-2.52	Stunting
25	75	8.5	-4.8	Severely Stunting
26	92	12.5	-1.48	Normal
27	82.5	10.5	-2.56	Stunting
28	83	10	-2.82	Stunting
29	89.5	13	-2.59	Stunting
30	94	13.2	-1.51	Normal

After being given an intervention in the form of balanced nutritious staple food for 90 days, then anthropometric measurements were taken in the form of toddler's weight and height. From the results of the table above it is known that the number of toddlers who have severely stunting nutritional status is 8 toddlers (26.6%), stunting nutritional status is 11 toddlers (36.6%) and those who have normal nutritional status are 11 toddlers (36.6%).

b. Statistical Test Results

After data on nutritional status before and after the intervention was collected, data analysis was then carried out using the SPSS Version 22 application with the Paired Sample T Test with the following results:

Table 4. Data Distribution

	Mean	N	Std Deviation	Std Error Mean
Before	79.950	30	4.4205	.8071
After	85.033	30	4.5104	.8235

From the table above it is known that the number of samples before and after the intervention was N = 30 each with a median height (average height) before the intervention of 79.95 cm and after the intervention of 85.03 cm. The standard deviation before the intervention was 4.4205 and after the intervention was 4.5104. The mean standard error before the intervention was 0.807 and after the intervention was 0.8235.

ABDIGERMAS

Jurnal Ilmiah Pengabdian Kepada Masyarakat Bidang Kesehatan

Table 5. Product Moment Correlation Test

	N	Correlation	Sg
Before & After	30	.847	.000

From the results of the product moment correlation test, it is known that a significance value of $0.00 \leq 0.05$ means that there is a relationship between height before the intervention and after the intervention in toddlers after being given an intervention in the form of a balanced nutritious staple food.

Table 6. Paired Sample T Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std Deviation	Std Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Before - After	-5.0833	2.4743	.4517	-6.0072	-4.1594	-11.253	29	.000

From the results of the statistical test table above, it can be interpreted as follows:

- It is known that the significance value = $0.000 \leq 0.05$, so there is a significant difference in toddlers' height before and after the intervention is given, so it can also be concluded that the provision of balanced nutritional staple food interventions can increase toddlers' height thereby reducing stunting rates in toddlers target.
- The value of t count = $-11.253 < t$ table 2.045, so statistically there is a difference in height between before and after being given a balanced nutritional staple food intervention for 90 days in the target toddlers.

2. Discussion

The study's location was chosen based on the health center in the area with the highest incidence of stunting, and 30 stunted toddlers were chosen from that group to get intervention based on how conveniently they could receive balanced nutrition staple foods at their homes.

Based on the results of this study, it was found that there was an increase in the nutritional status of stunting toddlers after being given specific interventions in the form of balanced nutritional staple food for 90 days. This shows that the most effective effort to reduce the prevalence of stunting is by providing nutritional intake to stunted toddlers. This is in accordance with previous research conducted by Jati and Nindya, who stated that the mother of toddler should to increase intake of energy, protein and zinc to prevent stunting and achieve appropriate development. Besides causing malnutrition status, energy intake is also related to the level development of stunted children. Toddlers with stunting have levels low development compared to children who have nutritional status which is normal [10].

In Indonesia, animal protein intake in children is low and can contribute to the high prevalence of stunting [11]. Child feeding practices are the only predictor of child stunting status and intervention programs for child feeding practices should be provided [12]. Protein has a major role in growth in toddlers. Protein intake is associated with an effect on plasma insulin growth levels [13]. Intake less protein associated with the risk of stunting 5,160 times compared with adequate protein intake in children under five. This is appropriate research which states that stunting children have high protein intake lower than normal children [14].

Stunting is a process cumulative caused by one of them is a lack of nutrients [15]. Intake of macronutrients is a contributing factor related to the incidence of toddler stunting. Based on research results previously by Tangkudung, showed that the intake of nutrients Macroeconomics is closely related to the incidence of stunting in toddlers [16].

D. Conclusion

Statistical test results with a significance value of $0.00 \leq 0.05$ indicate that there is a significant difference in toddlers' height before and after the intervention is given, so it can also be concluded that providing

ABDIGERMAS

Jurnal Ilmiah Pengabdian Kepada Masyarakat Bidang Kesehatan

balanced nutritional staple food interventions for 90 days can increase toddlers' height thus reducing the stunting rate in the target toddlers.

From the conclusions above, it is known that one of the effective intervention programs to reduce stunting rates is to provide balanced nutritional staple food to toddlers for at least 90 days. provide interventions in the form of balanced nutritional staple food for stunted toddlers in their respective work areas so that interventions for stunted toddlers can be given comprehensively to all stunted toddlers in Lubuklinggau City.

E. Acknowledgement

We would like thanks to Head of The Health Center and a Nutritionist at the Simpang Periuik Health Center and The Indonesian Nutrition Association (PERSAGI) DPC Lubuklinggau.

References

- [1] Kementerian Kesehatan RI, *Petunjuk Teknis Pemberian Makanan Tambahan Berbasis Pangan Lokal Bagi Ibu Hamil Kurang Energi Kronis (KEK) dan Balita Gizi Kurang*. Jakarta, 2022.
- [2] M. R. Nugroho, R. N. Sasongko, and M. Kristiawan, "Faktor-faktor yang Mempengaruhi Kejadian Stunting pada Anak Usia Dini di Indonesia," *J. Obs. J. Pendidik. Anak Usia Dini*, vol. 5, no. 2, pp. 2269–2276, 2021, doi: 10.31004/obsesi.v5i2.1169.
- [3] Parma, "Healthy growth and nutrition in children," *Barilla Cent. Food Nutr.*, pp. 8–9, 2009.
- [4] E. Martha *et al.*, "The Empowerment of Cadres and Medicastrs in the Early Detection and Prevention Of Stunting," *Indones. J. Public Heal.*, vol. 15, no. 2, pp. 153–161, 2020, doi: 10.20473/ijph.v15i2.2020.153-161.
- [5] Trihono *et al.*, *Pendek (Stunting) di Indonesia, Masalah dan Solusi*. 2015.
- [6] U. Rosa BCh, Sari K, Yunita SP, Amaliah N and NH., "Peran Intervensi Gizi Spesifik dan Sensitif dalam Perbaikan Masalah Gizi Balita di Kota Bogor," *Bul. Penelit. Kesehat.*, vol. 44, no. 2, pp. 127–38, 206AD.
- [7] T. Lancet, "Executive Summary of The Lancet Maternal and Child Nutrition Series," 2013.
- [8] E. Setiawan and R. Machmud, "Artikel Penelitian Faktor-Faktor yang Berhubungan dengan Kejadian Stunting pada Anak Usia 24-59 Bulan di Wilayah Kerja Puskesmas Andalas Kecamatan Padang Timur Kota Padang Tahun 2018," *J. Kesehat. Andalas*, vol. 7, no. 2, pp. 275–284, 2018.
- [9] S. F. P. Elsa Nur Aini, Sri Achadi Nugraheni, "Faktor Yang Mempengaruhi Stunting Pada Balita Usia 24- 59 Bulan Di Puskesmas Cepu Kabupaten Blora," *J. Kesehat. Masy. (e- Journal)*, vol. 6, no. 5, pp. 454–461, 2018.
- [10] T. S. Adani, F. Y. and Nindya, "Perbedaan Asupan Energi , Protein , Zink , dan Perkembangan pada Balita Stunting dan non Stunting," *Amerta Nutr.*, pp. 46–51, 2017, doi: doi: 10.20473/amnt.v1.i2.2017.46-51.
- [11] D. R. Sjarif, K. Yulianti, and W. J. Iskandar, "Daily consumption of growing-up milk is associated with less stunting among Indonesian toddlers," vol. 28, no. 1, pp. 70–76, 2019.
- [12] K. Phu, K. Phu, J. Wittayasoporn, and C. Kongsaktrakul, "Influence of child feeding practices and selected basic conditioning factors on stunting in children between 6 and 24 months of age in Myanmar Influence of child feeding practices and selected basic conditioning factors on stunting in children between 6 a," *Makara J. Heal. Res.*, vol. 23, no. 2, 2019, doi: 10.7454/msk.v23i2.10397.
- [13] E. M. et al. Sari, "Asupan protein, kalsium dan fosfor pada anak stunting dan tidak stunting usia 24-59 bulan," *J. Gizi Klin. Indones.*, vol. 12, no. 4, p. 152, 2016, doi: 10.22146/ijcn.23111.
- [14] A. Cahyati, W. H. and Yuniastuti, "Disparity of Risk Factors Stunting on Toddlers in the Coast and the Mountain Areas of Sinjai, South Sulawesi," *Public Heal. Perspect. J.*, vol. 4, no. 3, pp. 196–205, 2019.
- [15] A. Ayuningtyas, A., Simbolon, D. and Rizal, "Asupan Zat Gizi Makro dan Mikro terhadap Kejadian Stunting pada Balita," *J. Kesehat.*, vol. 9, no. 3, p. 445, 2018, doi: 10.26630/jk.v9i3.960.
- [16] G. Tangkudung, "Hubungan Antara Asupan Energi dengan Kejadian Stunting pada Anak Usia 13-36 Bulan di Wilayah Kerja Puskesmas Tuminting Kota Manado," *Kesmas*, vol. 00, p. 5, 2014.

Copyright Holder

© Nugroho, M. R., Armeidi, E., & Humsi, F.

First publication right :

Abdigermas: Jurnal Ilmiah Pengabdian Kepada Masyarakat Bidang Kesehatan

This article is licensed under:

