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# INNOVATION OF TONJANGPIS ABON IN AN INTEGRATED STUNTING PREVENTION MOVEMENT IN THE HEALTHY KITCHEN ANTI-STUNTING PROGRAM

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**ABSTRACT**
Stunting is a chronic condition that describes impaired growth due to long-term malnutrition. It is one of the consequences of malnutrition experienced by toddlers (children under five years old). It causes children to fail to grow and are too short for their age due to a lack of nutritional needs, namely protein sources. Toddlers who experience stunting will have suboptimal intelligence levels, be more susceptible to disease, and be at risk of mental retardation as well as decreasing productivity levels in the future. The occurrence of stunting in Indonesia is a recurring problem, and there is a fairly high prevalence of stunting each year in North Sumatra, Medan Belawan District. This study aims to determine the effect of the innovation of Tonjangpis abon (a combination of mackerel tuna and banana blossom floss) in an integrated stunting prevention movement on weight gain in 2-3-year-old children in Belawan I District. This is a quasi-experimental study with a one-group pre-test and post-test design. The research population was undernourished toddlers aged 12-36 months in Belawan I District, with a total sampling technique of 16 undernourished toddlers aged 12-36 months. The result shows a p-value of 0.004, which means there is a significant effect of Tonjangpis abon innovation in an integrated stunting prevention movement on weight gain in 2-3-year-old children.

Keywords: banana blossom; healthy kitchen anti-stunting; mackerel tuna; tonjangpis abon

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## INTRODUCTION

Stunting is a condition where the height-for-age index is more than two standard deviations below the WHO Child Growth Standard median. It is a chronic condition that describes impaired growth caused by long-term malnutrition. Children who experience stunting will have suboptimal intelligence levels, be more vulnerable to diseases, and can be at risk of mental retardation as well as decreased productivity levels in the future (Candra, 2020) Stunting is a recurring problem in Indonesia. According to data from the Asian Development Bank, the prevalence of stunting among children under five years old in Indonesia was 31 percent (ADB Key Indicators Database, 2022). In North Sumatra, the incidence of stunting was 21.1 percent in 2023 (Tim Percepatan Penurunan Stunting Provinsi Sumatera Utara, 2024). One of the regions in North Sumatra with a high prevalence of stunting every year is Belawan District.

The problem often found in society is that although fish resources are abundant, they have not been optimally utilized by the community to meet the nutritional needs of children. It is because of a lack of knowledge and economic disadvantages. Moreover, it is not uncommon for fishermen who catch fish to sell the fish they get to meet basic needs, thus reducing the opportunity for children and families to consume fresh and high-quality fish. Additionally, some parents still have never introduced or accustomed their children to consuming fish from

a young age. As a result, these children develop a dislike for fish as they grow older, leading to stunting (growth failure) in the toddler stage (Iskandar et al., 2021).One of the solutions to the existing problem is an innovative processed food made from mackerel tuna and banana blossom floss to provide a more complex nutritional content with a combination of animal and plant-based proteins. Mackerel tuna (Euthynnus affinis) is a nutritious fish with a high protein content. As its name suggests, this fish is actually related to other types of saltwater fish, such as tuna and mackerel. Therefore, the nutritional content of mackerel tuna is not significantly different from those fishes. Mackerel tuna possesses a nutritional profile of 100 grams consisting of 69.40% water, 1.50% fat, 25.00% protein, and 0.03% carbohydrate (Afiah et al., 2020). However, unlike tuna, which is relatively expensive, mackerel tuna is probably more widely consumed due to its relatively affordable price (Love et al., 2022). The quality of protein from mackerel tuna is considered complete (complete protein) and contains all essential amino acids in sufficient quantities to meet the body's needs (Tanjung et al., 2024).

Furthermore, plant-based protein is derived from banana blossom. For the Indonesian people, banana plants are well-known because they can grow easily in Indonesia. Generally, almost all parts of the banana plant can be utilized, from the fruit, the trunk, the leaves, the roots, and the banana blossom. As the seventh largest banana producer in the world, Indonesia annually yields millions of tons of bananas, with production steadily increasing each year (Statista, 2024). So, it is certain that banana blossoms are not difficult to obtain. The banana blossom is one of the food ingredients with good nutritional content for health, such as protein, phosphorus, minerals, calcium, vitamins B1 and C, a fairly high fibre content, and also high iron content (Kumari et al., 2023). Banana blossom contains, among other things, calories (51 Kcal), protein (1.6 g), fat (0.6 g), carbohydrates (9.9 g), fibre (57 g), calcium (56 mg), phosphorus (73.3 mg), iron (56.4 mg), potassium (553.3 mg), magnesium (48.7 mg), and vitamin E (1.07 mg) (Debnath et al., 2021).

Therefore, Tonjangpis abon (a combination of mackerel tuna and banana blossom floss) is the perfect and very complex combination to meet the nutritional needs of children's growth. It has both animal and plant-based protein with a high iron and fibre content, which is very beneficial in supporting children's growth. It can easily be made at home with a delicious flavor and at an affordable price, yet it offers immense benefits in supporting children's growth (Baunsele et al., 2023; Yanti et al., 2024) In general, there are two types of interventions carried out by the government in handling stunting, namely specific nutrition interventions and sensitive nutrition interventions. Specific nutrition interventions, one of which is carried out through the Local Supplementary Food Program (Anggraini & Suryani, 2018). This program is implemented by the government for toddlers (under-five years old group), aimed at providing additional food or nutrition beyond the daily main meal to address malnutrition problems (Darmini et al., 2022).

Direct observations conducted in Belawan I District in June 2024 revealed that some children had difficulty eating fish, disliked eating fish, and had stunted growth. Based on data obtained from Belawan I District and interviews with several parents of stunted children, it was reported that their children rarely ate fish and disliked eating fish. Additionally, the parents stated that they preferred selling fresh fish to meet their daily needs. Besides, their lack of knowledge regarding food modifications for children led to the children becoming bored with the variety of food served.Based on the explanation above, the objective of this research is to determine the effect of the innovation of Tonjangpis abon in an integrated stunting prevention movement on weight gain of 2-3 years old children in the Belawan I District.

## METHOD

This research employed a quasi-experimental design using a one-group pre-test and post-test design. The research population consisted of undernourished infants aged 12-36 months in Belawan I District, with a total sample of 16 undernourished infants using a total sampling technique. In this study, the infants' weight was measured first (pre-test), followed by an intervention of Tonjangpis abon, given twice daily at 150 mg for 60 days. Afterwards, the infants' weight was measured again (post-test).This research was conducted in June 2024. The study's population comprised 16 infants aged 12-36 months with malnutrition issues from Belawan I District. The sample for this study consisted of 16 undernourished infants aged 12-36 months, using a total sampling technique. Univariate analysis used measures of central tendency to calculate the weight before and after the intervention of the innovative Tonjangpis abon. Moreover, the bivariate analysis used the Wilcoxon signed-rank test to determine the innovative Tonjangpis abon's effect on weight changes among undernourished infants aged 12-36 months.

## RESULT

Table 1.
Frequency Before (Pre-test) and After (Post-test) Giving Tonjangpis Abon

| Variable | f | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|
| Pre-Test (Before Giving Tonjangpis Abon) | 16 | 8,00 | 12,100 | 6,2162 | 4,35811 |
| Post-Test (After Giving Tonjangpis Abon) | 16 | 14,00 | 13,100 | 9,5500 | 2,67905 |
| Valid N | 16 | | | | |

Table 1 shows that the results of weight gain in undernourished toddlers aged 12-36 months before the intervention of Tonjangpis abon obtained a minimum value of 8.00, a maximum value of 12,100, a mean of 6.2162, a median of 8.500, and a standard deviation of 4.35811. Subsequently, after the intervention of Tonjangpis abon (post-test), the minimum value obtained was 14.00, the maximum was 13.100, the mean was 9.5500, the median was 9.900, and the standard deviation was 2.67905. The mean (average) value showed an increase in body weight of 3.333 kg.

Table 2.
Wilcoxon Signed-Rank Test Analysis Before (Pre-test) and After (Post-test) Giving Tonjangpis Abon

| Variable | f | Median | Standard Deviation | Value |
|---|---|---|---|---|
| Pre-Test (Before Giving Tonjangpis Abon) | 16 | 9,20000 | 4,770329 | 0,004 |
| Post-Test (After Giving Tonjangpis Abon) | 16 | 10,25000 | 2,859724 | |
| Valid N | 16 | | | |

Table 2 shows that the results of the analysis using the Wilcoxon signed-rank test indicate a change in values before and after the intervention of Tonjangpis abon. The median value in the pre-test group was 9.20000, and the median value in the post-test group was 10.25000. Based on the Wilcoxon signed-rank test, a p-value of 0.004 was obtained, meaning that providing Tonjangpis abon improved the nutritional status of undernourished toddlers aged 12-36 months as assessed by weight gain.

## DISCUSSION

The research results showed an average (mean) weight gain of 3.333 kg in undernourished toddlers aged 12-36 months. Fish has a vital role as a source of energy, protein, vitamins, and essential minerals, contributing about 20% of total animal protein. The quality of fish protein is considered complete (complete protein), containing all essential amino acids in sufficient amounts to meet the body's needs. More than 200 species of fish are caught in Indonesian tropical waters, one of which is mackerel tuna (Darmini et al., 2022). Consumption of mackerel tuna can enhance growth in toddlers due to its high content of omega-3, which plays a crucial role in growth, especially brain development. In her research, Rahmawati (2024) revealed a significant 10.08-kilogram weight gain in the group that received mackerel tuna fish nugget supplementation during the ninety-day intervention period.Ariati (2019), in her research on a 30-day intervention of mackerel tuna fish nuggets with moringa leaves in undernourished toddlers aged 12-24 months, found an average weight gain of 0.34 kg. One of the amino acids required by the body is lysine and leucine, which are abundant in mackerel tuna. Protein, a macronutrient needed to increase the weight of toddlers, is formed by amino acids, which are the building blocks of protein. Therefore, a significant increase in weight will also impact an improvement in nutritional status.

This current research shows a p-value of 0.004, where $p < 0.05$, meaning that giving Tonjangpis abon affects the weight gain of undernourished toddlers aged 12-36 months. The intervention, given at 2x150 grams per day for 60 days, was proven to significantly increase the weight of undernourished toddlers by 3.333 kg. A study by Rahayu et al. (2020) indicated a significant relationship between children's energy and protein intake in determining the occurrence of stunting among young children, with a p-value of 0.001. Despite being situated on the riverbank, the area continues to grapple with a high prevalence of stunting due to the socioeconomic challenges faced by children's parents, particularly their limited knowledge about child nutrition. Moreover, previous research has shown that saltwater fish have higher levels of calcium, zinc, and iron compared to freshwater fish (Ullah et al., 2022). These findings are supported by Windiani & Adnyana (2024), who demonstrated a significant relationship between the consumption of animal protein and stunting. Stunting in young children can occur due to a deficiency or low quality of protein that contains essential amino acids (Husnaniyah et al., 2020). The growth rate in children occurs between the ages of 1-3 years. In addition, early childhood is a critical period as children undergo rapid development and growth, so an imbalance in protein consumption during this period can impact children's height. This aligns with Aisyah and Yunianto's (2021) assertion that malnutrition in children leads to thinness and stunted growth, resulting from a lack of energy and building block nutrients obtained from their diet.

## CONCLUSION

The study shows weight changes in undernourished toddlers aged 12-36 months before and after the intervention of Tonjangpis abon. There is an increase in mean value (average) weight of 3.333 kg. This means there is a significant effect of giving Tonjangpis abon on the weight of toddlers. Moreover, it can be concluded that there is a correlation between stunting and nutritional status, especially weight gain in toddlers aged 12-36 months in Belawan I District. This is evident from the significant p-value of 0.004, which is less than the alpha level ($\alpha$) of 0.05. It is recommended that health workers provide support, such as educating mothers about the nutritional needs of toddlers for optimal child growth.

**REFERENCES**

ADB Key Indicators Database. (2022). Prevalence of Stunting among Children under 5 Years of Age. https://kidb.adb.org › sdg-2-2-1-stunting-under-5

Afiah, N., Asrianti, T., Muliyana, D., & Risva. (2020). Rendahnya Konsumsi Protein Hewani Sebagai Faktor Risiko Kejadian Stunting Pada Balita Di Kota Samarinda [Low Animal Protein Consumption as a Risk Factor for Stunting in Toddlers in Samarinda City]. Nutrire Diaita, 12(1), 23–28.

Aisyah, I. S., & Yunianto, A. E. (2021). Hubungan asupan energi dan asupan protein dengan kejadian stunting pada balita (24-59 bulan) di Kelurahan Karanganyar Kecamatan Kawalu Kota Tasikmalaya [The Relationship Between Energy and Protein Intake and the Incidence of Stunting in Toddlers (24-59 Months) in Karanganyar Village, Kawalu District, Tasikmalaya City]. Jurnal Kesehatan Komunitas Indonesia, 17(1), 240–246.

Anggraini, M., & Suryani, T. (2018). Kualitas Ikan Tongkol (Euthynnus Affinis) Dengan Pengawet Alami Ekstrak Daun Kemangi dan Variasi Lama Perendaman [The Quality of Mackerel Tuna (Euthynnus affinis) Preserved with Natural Basil Leaf Extract and Varying Soaking Duration] [Doctoral dissertation]. Universitas Muhammadiyah Surakarta.

Ariati, L. I. P. (2019). Faktor-Faktor Resiko Penyebab Terjadinya Stunting pada Balita Usia 23-59 Bulan [Risk Factors Causing Stunting in Toddlers Aged 23-59 Months]. OKSITOSIN : Jurnal Ilmiah Kebidanan, 6(1), 28–37. https://doi.org/10.35316/oksitosin.v6i1.341

Baunsele, A. B., Faofeto, A., Missa, H., Djalo, A., Ndukang, S., Nadut, A., Tukan, G. D., Taek, M. M., & Sooai, A. G. (2023). Sosialisasi Pola Hidup Bersih Dan Sehat Dalam Upaya Pencegahan Stunting Di Desa Manleten Kabupaten Belu. Aptekmas Jurnal Pengabdian Pada Masyarakat, 6(1), 31–38.

Candra, A. (2020). Pencegahan dan Penanggulangan Stunting [Prevention and Mitigation of Stunting]. In Epidemiologi Stunting.

Darmini, N. W., Fitriana, L. B., & Vidayanti, V. (2022). Hubungan tingkat pengetahuan ibu tentang gizi seimbang dengan kejadian stunting pada balita usia 2-5 Tahun [The relationship between mothers' knowledge of balanced nutrition and the prevalence of stunting in 2-5 year old children]. Coping Community Publ Nurs, 10(2), 160–165.

Debnath, B., Singh, W. S., Goswami, S., & Manna, K. (2021). Taxonomical, phytochemical, traditional explanation, nutritional values, and biological activities of certain edible medicinal plants of Tripura, India.

Husnaniyah, D., Yulyanti, D., & Rudiansyah. (2020). Hubungan Tingkat Pendidikan Ibu dengan Kejadian Stunting [The Relationship Between Maternal Education Level and Stunting]. The Indonesian Journal of Health Science, 12(1), 57–64.

Iskandar, S. M. P. W., Muhsin, S. W., Elida, S., & Ayunda, H. M. (2021). The Relationship between Parenting Patterns and Fish Consumption in Elementary School-Age Children in West Aceh District. Journal of Nutrition Science, 2(1), 31. https://doi.org/10.35308/jns.v2i2.3626

Kemenkes. (2022). Survei Konsumsi Pangan Indonesia [Indonesia Food Consumption Survey]. Kementerian Kesehatan RI.

Kumari, P., Gaur, S. S., & Tiwari, R. K. (2023). Banana and its by-products: A comprehensive review on its nutritional composition and pharmacological benefits. EFood, 4(5), e110.

Love, D. C., Thorne-Lyman, A. L., Conrad, Z., Gephart, J. A., Asche, F., Godo-Solo, D., McDowell, A., Nussbaumer, E. M., & Bloem, M. W. (2022). Affordability influences nutritional quality of seafood consumption among income and race/ethnicity groups in the United States. The American Journal of Clinical Nutrition, 116(2), 415–425. https://doi.org/10.1093/ajcn/nqac099

Rahayu, A., Yulidasari, F., Anggraini, L., Rahman, F., Laily, N., Sari, A. R., Noor, M. S., Puteri, A. O., Rosadi, D., & Anhar, V. Y. (2020). Energy and Protein Intake-Related Risks Affected the Occurrence of Stunting Among Young Children. Proceedings of the 4th International Symposium on Health Research (ISHR 2019). https://doi.org/10.2991/ahsr.k.200215.063

Statista. (2024). Production of banana in Indonesia 2014-2023. Statista. https://www.statista.com/statistics/706727/production-of-banana-in-indonesia/

Tanjung, T. N. P., Eliska, E., & Tanjung, N. U. (2024). The utilization of mackarel tuna as Nutrient-Dense Complementary Food (MPASI). Science Midwifery, 12(3), 1056–1061.

Tim Percepatan Penurunan Stunting Provinsi Sumatera Utara. (2024). Laporan Semester I: Percepatan Penurunan Stunting Provinsi Sumatera Utara .

Ullah, Md. R., Rahman, Md. A., Haque, Md. N., Sharker, Md. R., Islam, M. M., & Alam, Md. A. (2022). Nutritional profiling of some selected commercially important freshwater and marine water fishes of Bangladesh. Heliyon, 8(10), e10825. https://doi.org/10.1016/j.heliyon.2022.e10825

Windiani, I. G. A. T., & Adnyana, I. G. A. N. S. (2024). The relationship between animal protein consumption and stunting in children in Gianyar, Bali, Indonesia. Bali Medical Journal, 13(3), 1413–1417.

Yanti, S. D., Oktafiani, V., Yunita, K. S., Putra, H. F. T. S., Darmawan, I., Alam, P. F., & Octaviany, V. (2024). Pemberdayaan Kader Posyandu Desa Barangka untuk Penanggulangan Stunting melalui Pelatihan Pengolahan Makanan Bergizi Tinggi: Cookies Singkong, Candy Kelor, dan Abon Ikan Tongkol. Community Development Journal: Jurnal Pengabdian Masyarakat, 5(1), 2244–2248.

United Nations Statistics Division. (2022). The Sustainable Development Goals Report 2022. United Nations Publications. Retrieved from https://unstats.un.org/sdgs/report/2022/