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Utilization Of Moringa Leaves As A Nutrient to Prevent Stunting In Children In Gantiang Village, Padang Panjang City

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ABSTRACT

Stunting is a critical public health issue in Indonesia. Despite various nutrition programs, the utilization of nutritious local foods, such as Moringa oleifera leaves, has not been maximized due to limited public awareness and inadequate education. This activity aims to increase public knowledge of the nutritional content and benefits of Moringa leaves for preventing stunting, and to provide training in processing Moringa into healthy foods. Methods: The activity was conducted on October 4, 2025, in Gantiang Village, Padang Panjang City. The target group comprised housewives, health care workers, and caregivers of toddlers. Data were collected through pre- and post-tests, as well as surveys of participant satisfaction and interest. Results: Following the educational and processing demonstration, participants' knowledge increased significantly; the program was deemed highly beneficial, and most expressed interest in incorporating Moringa leaf preparations into their family menus. Conclusion: Education and training in Moringa leaf processing have been effective in increasing public knowledge and interest in using Moringa as a nutritious food, thereby potentially supporting efforts to prevent stunting. For sustainability, it is recommended that this program be integrated into integrated health posts (Posyandu) and that further training be conducted to ensure that Moringa leaf consumption becomes a regular part of family eating habits.

Keywords: knowledge, moringa_leaf, stunting, satisfaction

INTRODUCTION

Stunting remains a national public health issue. Stunting is a condition of stunted growth due to chronic malnutrition, particularly during the first 1,000 days of life (Fitria, Amalia, et al., 2025). Stunting has long-term impacts on a child's physical development, intelligence, and future productivity. Despite various interventions, the utilization of nutritious local foods, including Moringa oleifera leaves, which are rich in vitamins, minerals, and protein and have the potential to serve as a community-based nutrition intervention, remains suboptimal (Anggraini et al., 2018; Diana & Fitria, 2022).

Although scientific evidence demonstrates the benefits of Moringa leaves in improving nutritional status, their use at the household level remains minimal. Mothers' limited knowledge of Moringa's nutritional content, a lack of processing innovation, and the misperception that Moringa leaves are used solely for traditional medicine are major obstacles (Dhakad et al., 2019; Hassan et al., 2021). They are unaware of the vital

nutritional value of Moringa leaves (Sun et al., 2020). Structured nutrition education on the benefits of moringa is scarce, creating a research gap due to the absence of educational programs with measurable effects on public knowledge of moringa's role in preventing stunting (Loa et al., 2021). The conceptual framework of this activity rests on the assumption that increased public knowledge will lead to changes in attitudes and behaviors regarding moringa consumption, thereby improving family nutritional status and supporting efforts to prevent stunting. Appropriate education, accompanied by demonstrations of moringa processing, is believed to increase the acceptance and utilization of highly nutritious local foods (Bernard et al., 2017; Diana et al., 2022).

This activity's contribution is crucial because it highlights the potential of readily available, affordable, and nutritious local foods to prevent stunting. Furthermore, this activity provides evidence-based instruction and generates measurable data through pre- and post-tests to assess its effectiveness. Specifically, this activity aims to increase public knowledge of the nutritional benefits of moringa leaves for preventing stunting, train participants in processing moringa into healthy foods, and evaluate changes in knowledge before and after the activity through statistical analysis.

METHOD

The Population and setting

The target population for this activity was housewives, community health post (Posyandu) health care workers, and caregivers of toddlers living in Gantiang Village, Padang Panjang City, West Sumatra. This group was selected because they are the primary decision-makers for family food and play a crucial role in stunting prevention. The activity took place in a community-based setting within the village, with support from village officials, health health care workers, and local Posyandu facilities. The location, in the center of community activities, facilitated broad participation and a more interactive, educational atmosphere. There are 22 participants in this activity.

Time and location

The activity took place on Saturday, October 4, 2025, in Gantiang Village, Padang Panjang City, West Sumatra. This location was chosen due to the high demand for nutrition education and the high potential for moringa utilization in the surrounding area.

Activity sequence and stages

The activity began with a preparatory phase that included coordination with village officials and integrated health post (Posyandu) health care workers, as well as the development of educational materials and pre- and post-test instruments. The implementation phase began with an opening and outreach session on the importance of stunting prevention, followed by a pre-test to assess respondents' initial knowledge (Johar et al., 2025). Next, participants received counseling on the nutritional content and benefits of moringa as a highly nutritious local food. The counseling session continued with a demonstration of moringa processing, including the preparation of moringa porridge, moringa tea, and other simple preparations. Following the educational session and interactive discussion, participants completed a post-test to assess their knowledge.

Materials, tools, and implementation techniques

The materials and tools used in the activity included fresh moringa leaves and moringa powder, educational posters and leaflets, simple cooking utensils such as a stove and a pan, and pre- and post-test sheets. The implementation method employed a

participatory approach through outreach, demonstrations, question-and-answer sessions, and hands-on practice using booklet.

Data Collection and Analysis Methods

Data were collected from respondents via a pre-test administered before the outreach program and a post-test administered after the outreach program to measure changes that occur as a result of the counseling provided. Knowledge scores were analyzed using a paired t-test because the normality test indicated a normal distribution. The analysis was conducted to determine whether pre- and post-activity scores differed significantly, thereby assessing the effectiveness of the education program (Fitria, Putra, et al., 2025). Participants' knowledge was measured using five true-false questions regarding the benefits, safety, and uses of moringa leaves. Each correct answer was awarded 1 point, for a maximum total score of 5. This instrument was administered twice: before the counseling (pre-test) and after all educational sessions and the moringa processing demonstration were completed (post-test). The difference between pre- and post-test scores was used to assess the intervention's effect on participants' knowledge. Questions covered moringa's nutritional content, safety for consumption, its role in stunting prevention, its potential for processing into supplement products, its use in food, and interest in trying moringa-based products.

RESULTS AND DISCUSSION

This section presents the results of the community service activities, including findings from pre- and post-tests, statistical analyses, and an assessment of participant satisfaction and interest in using moringa leaves as a nutrient to prevent stunting. These results are interpreted by comparing them with previous research and literature to strengthen the activity's relevance and validity.

Sociodemographic Characteristics of Respondents

The age distribution of respondents is shown in Table 1. The 36–45 age group was the largest, comprising nine respondents (40.9%). The 26–35 and 46–55 age groups each comprised five respondents (22.7%), while three respondents (13.6%) were missing data. The mean age for category 2 (SD = 0.745, median = 2) indicates that most participants were of productive age and actively involved in childcare. This age group is highly relevant as a target for nutrition education, as they are the primary decision-makers regarding family food consumption (Fitria, Amalia, et al., 2025; Khandelwal et al., 2020).

Table 1. Sociodemographic characteristics by age

Age (year)	n	%	mean	SD	median
26-35	5	22.7	2	0.745	2
36-45	9	40.9			
46-55	5	22.7			
Not answer	3	13.6			

Knowledge Improvement Based on Pre-test and Post-test

The results of this knowledge improvement are presented in Table 2. The pre-test mean score was 2.95 (SD 1.588), whereas the post-test mean score increased to 4.77 (SD 0.752). The decrease in the post-test standard deviation indicates that participants' understanding was more evenly distributed following the intervention. A paired t-test

analysis showed that the difference between pre-test and post-test scores was statistically significant (mean difference = -1.818; $t = -5.354$; $p = 0.000$; 95% CI: -2.524 to -1.112), indicating that the education on the use of moringa leaves was effective in improving knowledge. The correlation between pre- and post-test scores was 0.23 ($p = 0.302$), indicating that the increase in knowledge was not attributable to participants' initial knowledge level but was a direct effect of the educational intervention. The pre- and post-test work is shown in Figure 1.

Table 2. Knowledge improvement result

Data (N)	Mean	SD	CI 95%		t	df	p value
			Lower	Upper			
Pre-test	2.95	1.588					
Post-test	4.77	0.752					
Pre & Post	-1.818	1.593	-2.524	-1.112	-5.354	21	0.000

Analyzed using paired t-test

Satisfaction and Interest in Moringa Leaf-Based Products

Participant satisfaction ratings are shown in Table 3. The score was 94.54%, indicating that the delivery method, educational materials, and moringa processing demonstration were well-received. Furthermore, participants' interest in trying product innovations, such as moringa leaf meatballs, was 88.64%, indicating significant potential for adoption as part of the family's daily menu.

Table 3. Satisfaction score of the moringa leaf-based product

Item satisfaction	Percentage (%)
Satisfaction with the event	94.54%
Interest in trying moringa leaf meatballs if they were available in the market	88.64%

The results of this activity indicate that education about the benefits of moringa leaves had a significant positive effect on participants' knowledge. This increase in knowledge aligns with previous research, which found that a combination of educational methods and practical demonstrations is more effective in improving public understanding of nutrition (da Silva Lopes et al., 2021; Putri et al., 2020). Significant changes in pre- and post-test scores indicate that the material presented was relevant, easy to understand, and effective in correcting misperceptions about moringa leaves, which were previously considered only as a traditional medicine. This improvement can be explained through health education and behavior change theory, in which providing structured information can enhance the cognitive domain (knowledge), the initial stage in changing health attitudes and practices. According to the Knowledge-Attitude-Practice (KAP) model, increased knowledge is a crucial foundation for sustainable behavior change.

The predominance of participants aged 36–45 years indicates the program's success in reaching its strategic target group: most were housewives, who play a crucial role in ensuring family nutrition. This is supported by literature indicating that nutrition education is most effective when targeted at household food managers (Putri et al., 2020).

The high level of satisfaction and interest in moringa leaf meatballs indicates that local food innovations are well-received (Anjana et al., 2020). This presents a significant opportunity for further program development, such as regular training, the use of moringa in integrated health posts (Posyandu), Pemberian makanan Tambahan (Food and Nutrition

Program), or the establishment of small business groups based on moringa products (Novianti et al., 2021; Rimawati et al., 2018). Documentation of this activity can be seen in Figure 2 and Figure 3.

Limitations and Recommendations

Some limitations of this activity include the relatively small number of respondents, missing age data, and time constraints that reduced the effectiveness of the mentoring process. For future programs, it is recommended that this program include ongoing mentoring, training in a wider variety of moringa product processing, and integration of this activity with integrated health post (Posyandu) or Family Welfare Movement (PKK) programs to expand its sustainable impact.



Figure 1. Pre-test and post-test documentation



Figure 2. Educational activities on the use of moringa leaves in food to prevent stunting



Figure 3. Community service team members and participants

CONCLUSION

The community service activity on the use of moringa leaves as a nutrient to prevent stunting in Gantiang Village successfully provided participants with increased knowledge and a better understanding of the benefits of moringa and how to process it into family menus. The education provided successfully met the activity's objectives, namely, to increase public awareness of moringa's potential as a nutritious local food and to encourage its use in daily life. The participants' enthusiasm for moringa processing also suggests that this program could be further developed into a community-based nutrition intervention. To sustain the program, continued mentoring through integrated health post (Posyandu) activities, routine training in moringa processing, and active involvement of village officials and health care workers are recommended, so that moringa use becomes part of family nutritional habits and supports sustainable stunting-prevention efforts.

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REFERENCES

- Anggraini, L., Marlida, Y., Wizna, W., Jamsari, J., Mirzah, M., Adzitey, F., & Huda, N. (2018). Molecular identification and phylogenetic analysis of GABA-producing lactic acid bacteria isolated from indigenous dadih of West Sumatera, Indonesia. *F1000Research*, 7, 1663. <https://doi.org/10.12688/f1000research.16224.1>
- Anjana, R. M., Pradeepa, R., Deepa, M., Jebarani, S., Venkatesan, U., Parvathi, S. J., Balasubramanyam, M., Radha, V., Poongothai, S., Sudha, V., Shanthi Rani, C. S., Ranjani, H., Amutha, A., Manickam, N., Unnikrishnan, R., & Mohan, V. (2020). Acceptability and Utilization of Newer Technologies and Effects on Glycemic Control in Type 2 Diabetes: Lessons Learned from Lockdown. *Diabetes Technology & Therapeutics*, 22(7), 527–534. <https://doi.org/10.1089/dia.2020.0240>
- Bernard, J. Y., Armand, M., Peyre, H., Garcia, C., Forhan, A., De Agostini, M., Charles, M.-A., & Heude, B. (2017). Breastfeeding, Polyunsaturated Fatty Acid Levels in Colostrum and Child Intelligence Quotient at Age 5-6 Years. *The Journal of Pediatrics*, 183, 43-50.e3. <https://doi.org/https://doi.org/10.1016/j.jpeds.2016.12.039>
- da Silva Lopes, K., Yamaji, N., Rahman, M. O., Suto, M., Takemoto, Y., Garcia-Casal, M. N., & Ota, E. (2021). Nutrition-specific interventions for preventing and controlling anaemia throughout the life cycle: an overview of systematic reviews. *The Cochrane Database of Systematic Reviews*, 9(9), CD013092. <https://doi.org/10.1002/14651858.CD013092.pub2>
- Dhakad, A. K., Ikram, M., Sharma, S., Khan, S., Pandey, V. V., & Singh, A. (2019). Biological, nutritional, and therapeutic significance of *Moringa oleifera* Lam. *Phytotherapy Research : PTR*, 33(11), 2870–2903. <https://doi.org/10.1002/ptr.6475>

- Diana, F. M., & Fitria, N. (2022). Association of Omega 3 and Omega 6 and Child Development: A Systematic Review. *Nutricion Clinica y Dietetica Hospitalaria*, 42(2), 98–104. <https://doi.org/10.12873/422fivi>
- Diana, F. M., Ramadani, M., & Fitria, N. (2022). Pengaruh asam lemak pada penduduk terkait indeks massa tubuh. 46–50. <http://jurnal.fkm.unand.ac.id/index.php/jkma/article/view/1045>
- Fitria, N., Amalia, S. P., Machlaurin, A., & Nasif, H. (2025). The Role Of Iron Folic Acid And Multiple Micronutrients In Type Of Childbirth Delivery: Economic And Health Implication. *Asian Journal of Pharmaceutical and Clinical Research*, 18(2).
- Fitria, N., Putra, P. P., & Sari, Y. O. (2025). Long-term impact of pillbox use on medication adherence in patients with type 2 diabetes mellitus. *Pharmacy Practice*, 23(3), 1–9. <https://doi.org/https://doi.org/10.18549/PharmPract.2025.3.3236>
- Hassan, M. A., Xu, T., Tian, Y., Zhong, Y., Ali, F. A. Z., Yang, X., & Lu, B. (2021). Health benefits and phenolic compounds of Moringa oleifera leaves: A comprehensive review. *Phytomedicine: International Journal of Phytotherapy and Phytopharmacology*, 93, 153771. <https://doi.org/10.1016/j.phymed.2021.153771>
- Johar, H. F., Nasif, H., Fitria, N., & Aldi, Y. (2025). Validation of questionnaire on knowledge, attitude, practice of peptic ulcer patients to design pharmacist consultation model. *Journal of Advanced Pharmacy Education and Research*, 15(1), 8–15. <https://doi.org/10.51847/ZWIeGrYynF>
- Khandelwal, S., Kondal, D., Chaudhry, M., Patil, K., Swamy, M. K., Metgud, D., Jogalekar, S., Kamate, M., Divan, G., Gupta, R., Prabhakaran, D., Tandon, N., Ramakrishnan, U., & Stein, A. D. (2020). Effect of Maternal Docosahexaenoic Acid (DHA) Supplementation on Offspring Neurodevelopment at 12 Months in India: A Randomized Controlled Trial. *Nutrients*, 12(10). <https://doi.org/10.3390/nu12103041>
- Loa, M., Hidayanty, H., Arifuddin, S., Ahmad, M., & Hadju, V. (2021). Moringa oleifera leaf flour biscuits increase the index of erythrocytes in pregnant women with anemia. *Gaceta Sanitaria*, 35 Suppl 2, S206–S210. <https://doi.org/10.1016/j.gaceta.2021.10.022>
- Novianti, A., Mustika, A. B., & Mulyani¹, E. Y. (2021). Pengetahuan Gizi , Asupan Natrium , Kalium , Vitamin D. *Darussalam Nutrition Journal*, 5(2), 90–100.
- Putri, A. M. N., Chandra, D. N., Werdhani, R. A., & Bardosono, S. (2020). Relevant topics for education modules on healthy eating during pregnancy in the context of Indonesia. *International Journal of Applied Pharmaceutics*, 12(Special Issue 3), 58–62. <https://doi.org/10.22159/ijap.2020.v12s3.39475>
- Rimawati, E., Kusumawati, E., Gamelia, E., Sumarah, S., & Nugraheni, S. A. (2018). Intervensi Suplemen Makanan Untuk Meningkatkan Kadar Hemoglobin Pada Ibu Hamil. *Jurnal Ilmu Kesehatan Masyarakat*, 9(3), 161–170. <https://doi.org/10.26553/jikm.v9i3.307>
- Sun, J.-J., Wang, P., Chen, G.-P., Luo, J.-Y., Xi, Q.-Y., Cai, G.-Y., Wu, J.-H., Zeng, B., Xie, Y.-Q., Jiang, Q.-Y., Chen, T., & Zhang, Y.-L. (2020). Effect of Moringa oleifera supplementation on productive performance, colostrum composition and serum biochemical indexes of sow. *Journal of Animal Physiology and Animal Nutrition*, 104(1), 291–299. <https://doi.org/10.1111/jpn.13224>