JCEMTY Journal of Community Empowerment for Multidisciplinary (JCEMTY)
Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

Empowering Mothers Through Megamor Innovation (Mega Programme with Moringa Nuggets) to Prevent and Help Overcome Stunting

Pemberdayaan Ibu Melalui Inovasi Megamor (Mega Program dengan Nugget Kelor) untuk Mencegah dan membantu mengatasi Stunting

Finta Isti Kundarti[1], Ira Titisari[1], Dwi Estuning Rahayu[1], Alvi Nur Puspita Putri[1], Rysma Dhella Khammidah[1]

[1] Department of Midwifery, Poltekkes Kemenkes Malang, Indonesia

Correspondence:
Finta Isti Kundarti
fintaistikundarti@gmail.com

Abstract:

Stunting is a severe form of malnutrition and causes a person's weight to drop significantly quickly. In Keniten Village, RT/RW 001/004, cases of stunting among toddlers were found. This community service aims to increase the knowledge of mothers of toddlers about toddler nutrition and innovations in how to process food sourced from local wisdom, namely moringa leaves, which have high nutritional value. This community service activity was carried out in 1 meeting. This activity begins with counseling about toddler nutrition to mothers of toddlers, lasting 30 minutes. Then, the activity will continue with a Moringa Nugget cooking demonstration, which will last 30 minutes. This activity was attended by 17 mothers of toddlers and their toddlers. The cooking demonstration activity starts with preparing the tools and ingredients needed and then practicing how to process moringa leaves into Moringa nuggets. The results of the interviews and post-tests showed an increase in the understanding and skills of mothers of toddlers regarding understanding of children's nutrition, as well as innovations in processing additional food from local moringa leaves into Moringa nuggets. Suggestions for further community service activities include developing additional food processing innovations that are more diverse based on local ingredients often found in the surrounding area.

Keywords: stunting, moringa leaves, nutrition

Abstrak:

Stunting merupakan salah satu bentuk kekurangan gizi yang serius dan menyebabkan berat badan seseorang turun secara signifikan dalam waktu yang relatif singkat. Di Desa Keniten RT/RW 001/004 ditemukan kasus stunting pada balita. Tujuan dari pengabdian masyarakat ini adalah untuk meningkatkan pengetahuan ibu balita tentang gizi balita dan inovasi cara mengolah makanan yang bersumber dari bahan kearifan lokal yaitu daun kelor yang mempunyai nilai gizi yang tinggi. Kegiatan pengabdian masyarakat ini dilaksanakan dalam 1 kali pertemuan. Kegiatan ini diawali dengan penyuluhan tentang gizi balita kepada ibu balita, penyuluhan ini berlangsung selama 30 menit. Kemudian, kegiatan akan dilanjutkan dengan demo masak Nugget Kelor yang berlangsung selama 30 menit. Kegiatan ini diikuti oleh 17 orang ibu balita beserta balitanya. Kegiatan demo masak diawali dengan menyiapkan alat dan bahan yang dibutuhkan, kemudian mempraktikkan cara mengolah daun kelor menjadi nugget kelor. Hasil wawancara dan post test menunjukkan adanya peningkatan pemahaman dan keterampilan ibu balita mengenai pemahaman gizi anak dan juga inovasi dalam mengolah makanan tambahan dari daun kelor lokal menjadi nugget kelor. Saran untuk kegiatan pengabdian kepada masyarakat selanjutnya adalah mengembangkan inovasi pengolahan pangan tambahan yang lebih beragam sesuai dengan bahan lokal yang banyak terdapat di daerah sekitar.

Kata Kunci: *stunting, daun kelor, nutrisi*

Submitted: 07-03-2025 Revised: 29-03-2025 Accepted: 24-04-2025

DOI: https://doi.org/10.53713/jcemty.v3i1.340

Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

INTRODUCTION

Stunting is a condition of failure to grow in toddlers, which results in the child's height being inappropriate for their age (Picauly et al., 2024; Vaivada et al., 2020). Chronic malnutrition is the main factor causing stunting, especially in the first 1,000 days of a toddler's life (De Sanctis et al., 2021; Shofa et al., 2024). Childhood stunting impacts many children around the world. Both are important risk factors for disease and death. However, although both conditions have similar risk factors and often occur in the same children, they are generally described as relatively different manifestations of malnutrition (Sadler et al., 2023). Several studies on stunting in Indonesia show that factors related to stunting include the birth length of toddlers, family income or economic level, mother's education, history of exclusive breastfeeding, history of illness/infection, health services, and immunization history.(Kusumajaya et al., 2023; Thahir et al., 2023)

The impact of stunting on health is severe, especially in children who experience growth and development disorders, which can lead to serious complications and even death (Ariskawati et al., 2024). Children who experience stunting will generally experience obstacles in their cognitive and motor development, affecting their adult productivity (Alam et al., 2020; Ritanti & Aprilia, 2024). The relationship between child nutrition and health risks is clear and unmistakable. Stunted children suffer from inadequate nutrition and have a higher risk of death, often due to a lack of income or resources (Wand et al., 2024).

Activities pursued by the government to improve nutrition to prevent stunting or short toddlers are interventions in the health sector through activities such as immunization, providing additional food (PMT) for pregnant women, PMT for toddlers, and monitoring the growth and development of toddlers at Posyandu. Apart from providing PMT from the government, additional food or drinks high in macronutrients and micronutrients can be provided to meet nutritional needs. The development of additional food recovery is prioritized based on local food ingredients or foods (Octavia et al., 2025; Mahayaty et al., 2024)

It doesn't have to cost a lot of money so that mothers of toddlers can provide nutrition for their children because Keniten Village has abundant natural resources. Almost every resident's yard is covered with Moringa plants with excellent nutritional content for toddlers. Various moringa products have been developed, such as cakes, bread, yogurt, soup, weaning food, and biscuits. Complementary foods are defined as specially formulated foods, in ready-to-eat or ground form, that are modified in their energy density, protein, fat, or micronutrient composition to help meet nutritional requirements (Walia et al., 2019). Moringa leaves have the nickname Mother's Best Friend and Miracle Tree because Moringa is believed to have the potential to overcome malnutrition and hunger and prevent and treat various diseases throughout the world (Aldakheel et al., 2020)

Moringa leaves are a plant that is widely and easily cultivated in Indonesia and has the potential to be an ergonomic and cheap but still nutritious additional food (Katmawanti et al., 2021). Several

Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

experts have researched whether Moringa leaves are good for meeting the needs of children growing up; for children aged 1-3 years, 100 grams of fresh Moringa leaves will meet all their daily calcium needs, around 75% of iron and half their protein needs, as well as important supply potassium, Vitamin B complex, copper and essential amino acids. At least 20 grams of fresh leaves will provide children's vitamins A and C (Afriza et al., 2023; Nastiti et al., 2025).

However, in Keniten Village, most people, including mothers of toddlers, do not yet have optimal knowledge regarding providing balanced nutrition for children. Many mothers still complain that it is difficult for their children to eat, and mothers' creativity in preparing toddler menus is minimal, so the menu served is less attractive, and children refuse to eat.

Analysis of the situation in Keniten Village RT/RW 001/004 for our community service in 2024, the results of the knowledge of mothers of toddlers before and after the MEGAMOR (Mega Moringa) program: Megah Program with Moringa Leaves, which involved 17 mothers of toddlers and assessed their level of knowledge at post-test and after the post-test. When carrying out the pre-test, the distribution of knowledge levels of mothers of toddlers was as follows: very high 1 (5.8%), high 2 (11.8%), medium 3 (17.7%), low 6 (35.2%), and very low 5 (29.5%). After the post-test was carried out, the level of knowledge changed significantly, with a significant increase in the very high category to 58.9%, while the very low category fell to 0%. This community service aims to increase the understanding and skills of mothers of toddlers regarding child nutrition and innovation in processing additional food made from local moringa leaves into Moringa nuggets, especially in Keniten Village.

Community-based approaches to addressing stunting have been proven effective through various studies highlighting the role of maternal empowerment in improving children's nutritional status. Nutritional interventions based on local resources significantly reduce malnutrition rates (Sokhela et al., 2022). community-based strategies that include maternal education and utilization of local foods can significantly improve child growth. The MEGAMOR program that educates mothers in Keniten Village about Moringa leaves aligns with this approach, where increasing nutritional understanding contributes to behavioral changes in providing healthy food to children (Hamed, 2022).

In addition, using moringa leaves as an additional source of nutrition supports the food-based intervention, which is more effective than pharmaceutical-based nutritional supplementation in sustainably improving children's nutritional status (Brar et al., 2022). Moringa contains essential micronutrients that play a role in children's growth and development; consuming moringa can increase iron and protein levels in children's diets (Rotella & Soriano, 2022). Thus, intervention using local resources such as moringa increases food security and provides an economical and sustainable solution to overcoming stunting.

Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

IMPLEMENTATION METHOD

Implementing activities in this community service is with a team of 3 lecturers and 10 undergraduate applied midwifery students. This activity was carried out on Wednesday, 08 May 2024, at 14.00 – 16.00 WIB and took place at the Keniten Village Hall, with the target activity being mothers with toddlers from RT.001/RW.004 Keniten Village, totaling 17 people. Community service activities are carried out to overcome health problems using various methods: implementation preparation, lectures/counseling, cooking demonstrations, and questions and answers. The flow of community service activities includes:

1. Preparation for implementation

In preparation for this implementation, students initially collected data from all RT/RW 01/04 Keniten Village residents to find problems that were being experienced and needed to be resolved. Then, after finding a problem, students collaborate with lecturers, village midwives, coordinating midwives, and Keniten Village officials to conduct FGDs (Focus Group Discussions), which are used to plan programs to solve existing problems.

2. Lectures/counseling

Before the activity began, mothers of toddlers were asked to fill out a form expressing their willingness to participate in this community service activity voluntarily. This implementation is delivered using a lecture method, which contains material about the importance of preventing stunting and introducing locally processed ingredients to be used as additional food for toddlers to increase body weight. It also includes innovations by managing attractive foods.

3. Cooking demonstration

Before the cooking demonstration to create innovative processed foods from local wisdom, namely Moringa leaves, which have high nutritional value, the community service team consulted with a nutritionist from the Mojo Health Center about the food ingredients used, how to process them, nutritional value, and food safety. This cooking demonstration method implements a program created using local ingredients in Keniten Village, namely Moringa leaves. Moringa leaves are used as an innovative snack for toddlers, namely processed moringa nuggets, which have many benefits.

4. Question and answer

This activity's success indicators are increasing mothers' knowledge about toddler nutrition and innovation in processing toddler food from local wisdom and moringa leaves. A questionnaire will be used to determine the knowledge of mothers of toddlers.

A questionnaire for this activity uses the pre-test (initial test) and post-test (final test) orally. This pre-test aims to determine the target level of knowledge gained before presenting the material. Meanwhile, this post-test aims to find out the target of understanding and understanding the material that has been presented previously so that you can get an idea of the abilities achieved after the end of the delivery of the material that has been given. At the end of the event, an oral post-test was

carried out to find out how well the community accepted the material for the pre-test question, which contained questions about how to cook Moringa nuggets before the cooking demonstration.

The results will be analyzed by differentiating the knowledge of mothers of toddlers before and after being given material on toddler nutrition and demonstrating how to process food from moringa leaves.

Figure 1. Flow of implementation of community service activities

RESULT AND DISCUSSION

The result of this community service activity is an increase in the knowledge of mothers of toddlers regarding innovations in providing additional food to toddlers who are stunted. Univariate analysis was carried out through the frequency distribution of knowledge of mothers of toddlers, namely 17 people before and after counseling and cooking demonstrations using local ingredients, effectively preventing stunting. The frequency distribution of knowledge of mothers of toddlers before and after counseling on preventing stunting using local materials (moringa leaves) can be seen in the following table.

Table 1. Frequency distribution of knowledge of mothers of toddlers before and after the MEGAMOR (Mega Moringa) program: Megah Program with Moringa Leaves (n=17)

Knowledge	Frequency	Percentage (%)
Pre-test		
Very high	1	5.8
Tall	2	11.8
Enough	3	17.7
Low	6	35.2
Very low	5	29.5
Post-test		
Very high	10	58.8
Tall	5	29.5
Enough	1	5.8
Low	1	5.8
Very low	0	0

Based on Table 1 regarding the frequency distribution of knowledge of mothers of toddlers before and after the MEGAMOR (Mega Moringa) program: Megah Program with Moringa Leaves, the pre-test results showed that the distribution of knowledge levels of mothers of toddlers was as follows: very high 1 (5.8%), high 2 (11.8%), medium 3 (17.7%), low 6 (35.2%), and very low 5

(29.5%). After the post-test was carried out, the level of knowledge changed significantly, with a significant increase in the very high category to 58.9%, while the very low category fell to 0%.

1. Implementation of FGD (Focus Group Discussion)

Figure 2. Implementation of FGD

2. Implementation of outreach activities and cooking demonstrations

Figure 3. Extension materials

Figure 4. MEGAMOR (Mega Moringa) Leaflet: Megah Program with Moringa Leaves

Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

Figure 5. MEGAMOR (Mega Moringa) product: Megah Program with Moringa Leaves

Figure 6. Implementation of counseling about nutrition for toddlers

Figure 7. Implementation of Moringa Nugget Cooking Demo

Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

Figure 8. Implementation of Counseling and Demonstrations

Malnutrition counseling for mothers of toddlers to prevent malnutrition or malnutrition or conditions of failure to grow in children under five caused by malnutrition (Stunting). Before the counseling was carried out, the presenters carried out a pre-test in the form of questions on the use of local ingredients that are usually processed in Keniten Village. This extension received good enthusiasm from the community, and many people used local moringa leaves to make food menus, such as vegetable soup and stir-fried moringa or additional vegetables. Moringa leaves (moringa oleifera) are a food source with high nutritional value (Azlan et al., 2022). Nutrition counseling for toddlers to mothers according to the portions on my plate. The program to prevent stunting is the "MEGAMOR" program (Mega Moringa: Megah Program with Moringa Nuggets). This program is by the use of local materials that are often found in the Keniten Village area.

After the counseling activities, a cooking demonstration was continued. This cooking demonstration was carried out to provide ideas for variations in food menus for mothers of toddlers using local ingredients found around Keniten village, namely Moringa leaves. Moringa leaf processed products are very diverse, ranging from vegetables, Moringa leaf tea, Moringa leaf flour, and nuggets. Moringa leaves contain phytosterol compounds, compounds that are insoluble in water. Therefore, when processing Moringa leaf nuggets, you must use fresh Moringa leaves and all parts of the leaf (Abdalla et al., 2022). Moringa leaves are efficacious in helping toddlers suffering from stunting to get additional vitamins, which are important for children's growth and development (Katmawanti et al., 2021; Hanifiyah et al., 2024). This cooking demonstration activity began with the group showing a video about processing Moringa nuggets. Chicken nuggets with Moringa leaves can be used as additional food for toddlers with high crude protein and fiber content needed by

Volume 03, Number 01 (May 2025)
p-ISSN: 2987-5072 e-ISSN: 2987-5080

stunting toddlers (Yasin et al., 2024). After showing the video, the presenter in charge does a cooking demonstration. This cooking demonstration activity was lively and interactive. Mothers of toddlers and several guests also had the opportunity to taste Moringa nuggets.

This food innovation in the form of Moringa nuggets was welcomed by mothers of toddlers because, apart from its delicious taste, the ingredients are also easy to obtain and cheap. This cooking demonstration activity was accompanied by a leaflet containing a recipe for moringa nuggets, the benefits of moringa nuggets, and a barcode that could be accessed at any time containing a video on how to process moringa nuggets. At the end of the event, an oral post-test was carried out to find out how well the community accepted the material for the pre-test question, which contained questions about how to cook Moringa nuggets.

In its implementation, this program may face several obstacles and require solutions. During implementation, obstacles were that the counseling program did not start on time because several mothers of toddlers did not show up on time, and the counseling was not conducive because there was one fussy toddler. The solution to overcome these obstacles is to start the event immediately, even though some of the target mothers of toddlers who were invited have not yet arrived, and provide a place to play, snacks, and educational shows for the children as well as a committee tasked with helping to calm them down.

Suggestions for implementing future activities include discussing with all mothers of toddlers how to find the right time to implement community service activities so that mothers of toddlers can come to community service activities on time. To anticipate toddlers who become fussy during activities, bring a caregiver (grandmother, father, sibling) when participating in community service activities so that the toddler's mother can focus on participating in the activities and someone can look after/look after her child while the activity is taking place. By recognizing and overcoming the obstacles above, the community service activities program can run more smoothly and effectively and provide better nutritional benefits for the community.

The "MEGAMOR" program integrates nutrition education and cooking demonstrations using local ingredients such as moringa leaves, which has shown a practical approach to preventing stunting in toddlers. The research emphasized that stunting and malnutrition in children have similar risk factors and often occur together, making community-based nutrition interventions crucial (Mathews et al., 2023). Nutrition education and agricultural interventions have improved children's dietary diversity and nutritional status (Pareek et al., 2023). In addition, providing Moringa leaf supplements during pregnancy can prevent stunting in children aged 36 to 42 months (Basri et al., 2021).

Utilizing moringa leaves as a local food source in community nutrition education programs can effectively improve nutritional status and prevent stunting in children. Moringa leaves are rich in important micronutrients such as vitamin A, iron, and calcium, essential for child growth and development (Escher et al., 2024). A study showed that food-based interventions utilizing local

resources can improve nutrient intake and nutritional status in children at risk of stunting (Mulu et al., 2022). Thus, an approach combining nutritional education and using local food ingredients such as moringa leaves can provide a sustainable solution to prevent toddler stunting.

The success of the MEGAMOR program can also be associated with the Behavior Change Theory, which states that education accompanied by real practice and visual stimulation will be more easily accepted and adopted in daily habits. In this context, cooking demonstrations and providing recipes through leaflets and video barcodes are effective strategies in increasing understanding and encouraging the adoption of nutritious food consumption habits based on moringa leaves. Practice-based education programs like this can increase children's nutritional intake in the long term, helping significantly reduce stunting rates.

CONCLUSION AND SUGGESTIONS

This community service activity concludes that there is an increasing number of mothers' knowledge about toddler nutrition and innovation in processing toddler food from local wisdom sources, namely, moringa leaves, which have high nutritional value. What distinguishes this community service program from other programs is that it uses local wisdom materials, namely moringa leaves, which have high nutritional value. Moringa leaves grow abundantly and is found in the Keniten village area.

The next suggestion for community service providers is to continue developing skills in teaching additional food processing methods to mothers of toddlers and providing the support and understanding needed to increase awareness of the importance of toddler nutrition.

Suggestions for community service partners, such as village officials or local government, can facilitate and help cadre mothers and mothers of toddlers in Keniten Village reduce the high risk of stunting and provide sustainability of additional feeding programs with other variations. Hopefully, this program can strengthen cross-sector collaboration among related parties such as nutritionists or other health experts concerned with improving the quality and availability of additional nutritious food.

REFERENCES

Abdalla, H. A., Ali, M., Amar, M. H., Chen, L., & Wang, Q. (2022). Characterization of Phytochemical and Nutrient Compounds from the Leaves and Seeds of Moringa oleifera and Moringa peregrina. *Horticulturae*, *8*(11), 1081. https://doi.org/10.3390/horticulturae8111081

Alam, M. A., Richard, S. A., Fahim, S. M., Mahfuz, M., Nahar, B., Das, S., Shrestha, B., Koshy, B., Mduma, E., Seidman, J. C., Murray-Kolb, L. E., Caulfield, L. E., & Ahmed, T. (2020). Impact of early-onset persistent stunting on cognitive development at 5 years of age: Results from a multi-country cohort study. *PloS One*, *15*(1), e0227839. https://doi.org/10.1371/journal.pone.0227839

Aldakheel, R. K., Gondal, M. A., Nasr, M. M., Almessiere, M. A., & Idris, N. (2020). Spectral analysis of

Miracle Moringa tree leaves using X-ray photoelectron, laser induced breakdown and inductively coupled plasma -optical emission spectroscopic techniques. *Talanta*, *217*, 121062. https://doi.org/10.1016/j.talanta.2020.121062

Ariskawati, D., Prihayati, & Ismarina. (2024). Determinants Analysis of Increasing Incidents of Stunting among Toddlers Aged 6-59 Months. *Nursing and Health Sciences Journal (NHSJ)*, *4*(3), 323–331. https://doi.org/10.53713/nhsj.v4i3.406

Azlan, U. K., Mediani, A., Rohani, E. R., Tong, X., Han, R., Misnan, N. M., Jam, F. A., Bunawan, H., Sarian, M. N., & Hamezah, H. S. (2022). A Comprehensive Review with Updated Future Perspectives on the Ethnomedicinal and Pharmacological Aspects of Moringa oleifera. *Molecules (Basel, Switzerland)*, *27*(18). https://doi.org/10.3390/molecules27185765

Basri, H., Hadju, V., Zulkifli, A., Syam, A., & Indriasari, R. (2021). Effect of Moringa Oleifera Supplementation during Pregnancy on the Prevention of Stunted Growth in Children between the Ages of 36 to 42 Months. *Journal of Public Health Research*. https://doi.org/10.4081/jphr.2021.2207

Brar, S., Haugh, C., Robertson, N., Owuor, P. M., Waterman, C., Fuchs, G. J., & Attia, S. L. (2022). The impact of Moringa oleifera leaf supplementation on human and animal nutrition, growth, and milk production: A systematic review. *Phytotherapy Research*, *36*(4), 1600-1615. https://doi.org/10.1002/ptr.7415

De Sanctis, V., Soliman, A., Alaaraj, N., Ahmed, S., Alyafei, F., & Hamed, N. (2021). Early and Long-term Consequences of Nutritional Stunting: From Childhood to Adulthood. *Acta Bio-Medica : Atenei Parmensis*, *92*(1), e2021168. https://doi.org/10.23750/abm.v92i1.11346

Escher, N. A., Andrade, G. C., Ghosh-Jerath, S., Millett, C., & Seferidi, P. (2024). The effect of nutrition-specific and nutrition-sensitive interventions on the double burden of malnutrition in low-income and middle-income countries: a systematic review. *The Lancet. Global Health*, *12*(3), e419–e432. https://doi.org/10.1016/S2214-109X(23)00562-4

Hamed Kandil, S. (2022). The role of food culture in developing the nutritional awareness and healthy behavior of students. *International Journal of Humanities and Language Research*, *5*(1), 49-60. https://doi.org/10.21608/ijhlr.2023.215929.1012

Hanifiyah, F., Cristi Crismono, P., Agustin Reni Pitasari, M., & Dwi Febriyanti, B. (2024). Efforts to Prevent Stunting by Conducting Socialization and Demonstration of Moringa Leaf Pudding Making in Glagahwero Village, Kalisat District, Jember Regency: Upaya Pencegahan Stunting dengan Melakukan Sosialisasi serta Demonstrasi Pembuatan Puding Daun Kelor di desa Glagahwero, kecamatan Kalisat, Kabupaten Jember. *Journal of Community Empowerment for Multidisciplinary (JCEMTY)*, *2*(2), 122–128. https://doi.org/10.53713/jcemty.v2i2.257

Katmawanti, S., Supriyadi, S., & Mariroh, F. (2021). Is instant porridge with a high calcium content based on Moringa oleifera as an alternative baby food to prevent stunting in Indonesia? *Journal of Public Health Research*, *10*(2). https://doi.org/10.4081/jphr.2021.2233

Kusumajaya, A. A. N., Mubasyiroh, R., Sudikno, S., Nainggolan, O., Nursanyoto, H., Sutiari, N. K., Adhi, K. T., Suarjana, I. M., & Januraga, P. P. (2023). Sociodemographic and Healthcare Factors Associated with Stunting in Children Aged 6-59 Months in the Urban Area of Bali Province, Indonesia 2018. *Nutrients*, *15*(2). https://doi.org/10.3390/nu15020389

Mahayaty, Citra Darmawan, T., Nirmala Santiasari, R., & Wahyu Prasetyo, N. (2024). Understanding Parenteral Behavior Changes Through Supplementary Feeding: A Small Group Discussion. *Nursing and Health Sciences Journal (NHSJ)*, *4*(2), 238–243. https://doi.org/10.53713/nhsj.v4i2.360

Mathews, T., Hayer, S. S., Dinkel, D., Hanish, A., Poppert Cordts, K. M., Rasmussen, H., & Moore, T. (2023). Maternal-Child Microbiome and Impact on Growth and Neurodevelopment in Infants and Children: A Scoping Review. *Biological Research For Nursing*, *25*(3), 454–468. https://doi.org/10.1177/10998004221151179

Mulu, N., Mohammed, B., Woldie, H., & Shitu, K. (2022). Determinants of stunting and wasting in street children in Northwest Ethiopia: A community-based study. *Nutrition (Burbank, Los Angeles County,*

Calif.), *94*, 111532. https://doi.org/10.1016/j.nut.2021.111532

Nastiti, A. D., Puspitasari, R. H., Handayani, D., & Rahmad Irwansyah, F. (2025). The Effect of Moringa Leaf Fortification on Improving the Nutritional Status of Stunting Toddlers in Coastal Areas. *Health and Technology Journal (HTechJ)*, *3*(2), 180–188. https://doi.org/10.53713/htechj.v3i2.338

Octavia, L., Wirawan, N. N., Nirmala, I. R., Sudarma, V., Liman, P. B., Fitrianingsih, Rahardjo, W., Nurdiani, R., & Wiralis. (2025). Utilizing Local Food Sources in a Sustainable Healthy Diet System and Psychosocial Care to Reduce Malnutrition. *Pediatric Gastroenterology, Hepatology & Nutrition*, *28*(2), 135–140. https://doi.org/10.5223/pghn.2025.28.2.135

Pareek, A., Pant, M., Gupta, M. M., Kashania, P., Ratan, Y., Jain, V., Pareek, A., & Chuturgoon, A. A. (2023). Moringa oleifera: An Updated Comprehensive Review of Its Pharmacological Activities, Ethnomedicinal, Phytopharmaceutical Formulation, Clinical, Phytochemical, and Toxicological Aspects. *International Journal of Molecular Sciences*, *24*(3). https://doi.org/10.3390/ijms24032098

Picauly, I., Adi, A. A. A. M., Meiyetriani, E., Mading, M., Weraman, P., Nashriyah, S. F., Boeky, D. L. A., Lobo, V., Saleh, A., Peni, J. A., Hidayat, A. T., & Marni, M. (2024). Determinants of child stunting in the dryland area of East Nusa Tenggara Province, Indonesia: insights from a national-level survey. *Journal of Medicine and Life*, *17*(2), 147–156. https://doi.org/10.25122/jml-2023-0313

Ritanti, & Aprilia, F. . (2024). The Relationship between Maternal Characteristics and Family Health Tasks with the Incident of Stunting in Toddlers in Depok City. *Nursing and Health Sciences Journal (NHSJ)*, *4*(4), 472–481. https://doi.org/10.53713/nhsj.v4i4.431

Rotella, R., & Soriano, J. M. (2022). The Impact of Moringa oleifera Supplementation on Anemia and other Variables during Pregnancy and Breastfeeding: A Narrative Review. *Nutrients*, *15*(12), 2674. https://doi.org/10.3390/nu15122674

Sadler, K., James, P. T., Bhutta, Z. A., Briend, A., Isanaka, S., Mertens, A., Myatt, M., O'Brien, K. S., Webb, P., Khara, T., & Wells, J. C. (2023). How Can Nutrition Research Better Reflect the Relationship Between Wasting and Stunting in Children? Learnings from the Wasting and Stunting Project. *The Journal of Nutrition*, *152*(12), 2645–2651. https://doi.org/10.1093/jn/nxac091

Shofa, Nisak Berliana Ahmad, Dzakia Raisa, Hadi Kurniyawan, E., Tri Afandi, A., Endrian Kurniawan, D., & Rosyidi Muhammad Nur, K. (2024). Food Security on The Incidence of Stunting in Agricultural Areas. *Nursing and Health Sciences Journal (NHSJ)*, *4*(4), 451–458. https://doi.org/10.53713/nhsj.v4i4.432

Sokhela, H., Govender, L., & Siwela, M. (2022). Complementary Feeding Practices and Childhood Malnutrition in South Africa: The Potential of Moringa Oleifera Leaf Powder as a Fortificant: A Narrative Review. *Nutrients*, *15*(8), 2011. https://doi.org/10.3390/nu15082011

Thahir, A. I. A., Li, M., Holmes, A., & Gordon, A. (2023). Exploring Factors Associated with Stunting in 6-Month-Old Children: A Population-Based Cohort Study in Sulawesi, Indonesia. *Nutrients*, *15*(15). https://doi.org/10.3390/nu15153420

Vaivada, T., Akseer, N., Akseer, S., Somaskandan, A., Stefopulos, M., & Bhutta, Z. A. (2020). Stunting in childhood: an overview of global burden, trends, determinants, and drivers of decline. *The American Journal of Clinical Nutrition*, *112*, 777S-791S. https://doi.org/10.1093/ajcn/nqaa159

Walia, K., Kapoor, A., & Farber, J. M. (2019). Qualitative Microbiological Risk Assessment of Moringa oleifera Leaf Powder To Be Used To Treat Undernutrition in Infants and Children in Cambodia and India: A Review. *Journal of Food Protection*, *82*(3), 513–521. https://doi.org/10.4315/0362-028X.JFP-18-252

Wand, H., Moodley, J., Reddy, T., & Naidoo, S. (2024). Geospatial correlations and variations in child mortality and stunting in South Africa: Evaluating distal vs structural determinants. *Spatial and Spatio-Temporal Epidemiology*, *50*, 100653. https://doi.org/10.1016/j.sste.2024.100653

Yasin, Z., Nawawi, A., Wibowo, A., Nadhiroh, S. R., & Devy, S. R. (2024). Effects of Moringa oleifera on increasing breast milk in breastfeeding mothers with stunting toddlers in rural Batang-Batang District, Indonesia. *African Journal of Reproductive Health*, *28*(10s), 34–4. https://doi.org/10.29063/ajrh2024/v28i10s.4