

THE NUTRITIONAL POTENTIAL OF MORINGA OLEIFERA LEAVES AS A SOLUTION FOR PREVENTING STUNTING IN CHILDREN

Inayah Shakira Aziz¹, Shofa Fairuz Renova², Nadzifah Musnadi Lubis³, M Daffa Putranta
Gunawan Perangin angin⁴, Keisya Khalilah Andri⁵

SMAS Unggulan Al Azhar

*Penulis korespondensi email: inayahaziz08@gmail.com

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Abstract

The prevalence of stunting among toddlers in Indonesia, at 21,6%, is a major public health issue. Chronic malnutrition during the first 1.000 days of life is a major cause of stunting, requiring effective and sustainable nutritional interventions based on local food sources. Moringa leaves (*Moringa Oleifera*) are known as a highly nutritious food with high nutritional content such as iron, protein, calcium, vitamins C and A, which can support child growth. This literature study evaluates the nutritional content of moringa leaves, the effectiveness of moringa leaf consumption interventions in preventing stunting, as well as the success factors and challenges of implementing moringa leaf supplementation in various forms (powder, extract, biscuits, pudding) significantly increases children's weight, height, and HAZ scores, as well as reducing the prevalence of stunting. Regular consumption and product innovations that appeal to children enhance acceptance and effectiveness of interventions. Moringa leaves offer a local, economical, and sustainable solution for stunting prevention; however, multisectoral support and education are needed to optimize their benefits on a broader scale.

Keywords : *Stunting, Moringa Leaves, Nutrition.*

INTRODUCTION

Stunting is a growth disorder in toddlers, indicated by a height-for-age (TB/U) that does not exceed -2 SD from the WHO median. In Indonesia, the prevalence of stunting remains high. Data from the 2022 Indonesian Nutrition Status Survey (SSGI) shows that the national prevalence rate is around 21.6%. In some provinces, this rate is even higher than the national average, such as in South Jakarta, where it is recorded at 11.9% for toddlers. This condition has a long-term impact on motor and cognitive development, productivity, and the quality of human resources in the future. One of the main causes of stunting is chronic malnutrition during the first 1,000 days of life, resulting from an inadequate and poorly diversified diet that is low in critical micronutrients such as protein, iron, vitamins A and C, and calcium. Efforts to prevent stunting require effective, sustainable nutritional interventions based on local food sources. Moringa leaves (*MORINGA OLEIFERA*) are known as a superfood because they are scientifically proven to be very high in nutrients. Because they are economical and easy to cultivate in tropical environments such as Indonesia, moringa leaves are a strategic choice for supporting community nutrition interventions.

1. Nutrition in Moringa Leaves

Various studies have shown that moringa leaves are rich in protein (approximately 26-35 g/100 g dry weight), iron (approximately 27-36 mg/100 g), calcium (>2,000 mg/100 g), and very high levels of vitamins A and C. For example, they contain more vitamin A than carrots, more calcium than milk, and more iron than spinach.

2. Evidence of Effectiveness in Preventing Stunting

A review of five journals concluded that moringa supplementation, whether in powder, extract, or fortified food form, had a significant effect on reducing stunting in children under five years of age. A quasi-experimental study showed an increase in the average HAZ score of +0.65 SD and a decrease in the prevalence of stunting from around 90% to 50% after a 6-month intervention ($p = 0.002$).

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3. Community Education and Acceptance

Field research in several areas such as Bangkalan, Jambi, and South Jakarta indicates that educating mothers and cadres on how to process and consume moringa leaves increases acceptance, knowledge, and consumption practices. Consumption of snacks made from moringa, such as pudding, noodles, and biscuits, has been proven to be popular among toddlers and effective in supporting local nutritional supplementation.

Based on this background, this study aims to:

1. Examine the important nutritional content of moringa leaves from scientific literature (2020–2025).
2. Evaluate evidence of moringa leaf intervention in preventing stunting in children under five.
3. Assess the success factors and challenges in implementing moringa education and consumption programs in Indonesian communities.

RESEARCH METHODS

The study used library research through a descriptive qualitative approach. Data were collected from various scientific sources, such as nationally and internationally accredited journals, research reports, scientific books, and articles related to moringa leaves and stunting in children. These were publications that discussed:

1. Nutritional content of moringa leaves,
2. Intervention of moringa leaf consumption in children,
3. Its impact on nutritional status and stunting prevention.

RESULTS AND DISCUSSION

1. The Effect of Consuming Moringa Leaf Biscuits

A study in Madura (Media Gizi Indonesia, 2023) showed that consumption of biscuits made from moringa leaves increased children's average weight by +0.35 kg/month and height by +0.65 cm/month during a 2-month intervention (n≈31 toddlers).

2. The Effects of Regular Consumption of Moringa Leaves in the Diet

A study by Cahyaningsih et al. (2025) used a pre-post quasi-experimental design without controls on 30 toddlers. After regularly consuming moringa-based foods, there was an increase in weight of +2.01 kg and height of +1.3 cm during the intervention period. The Wilcoxon test showed significant changes before and after the intervention, although the p-value was not specifically reported by the authors.

3. Diversification of Moringa Leaf Pudding and Children's Acceptance

Rahayu Ningsih et al. (2024) studied moringa leaf pudding in Langkat Regency. The results showed that moringa pudding was well accepted by toddlers because of its soft texture and sweet taste. This innovation increased children's calorie and micronutrient intake, supporting the prevention of local stunting.

4. Micronutrient Content in Moringa Leaves

Studies by Basri et al. (2022) and Gopalakrishnan et al. (2016) state that moringa leaves contain high protein (~27 g/100 g), iron (~28 mg/100 g), calcium (~2000 mg/100 g), and very high vitamin A and C, all of which are important nutrients for optimal growth in toddlers.

CONCLUSIONS AND SUGGESTIONS

1. Mechanism of Nutritional Status Improvement by Moringa Leaves

The increase in HAZ scores in the moringa group was due to the integration of macro-micronutrients: high protein supports muscle and bone synthesis, iron prevents anemia that inhibits growth, and vitamins A and C support immunity and optimal iron absorption.

2. Consumption of Moringa Leaf Biscuits: Practical and Effective

A study in Bangkalan highlighted that moringa-based biscuits were well accepted by children, indicating that processed foods that are familiar and liked by children accelerate changes in nutritional status, especially weight and height gain in a short period of time.

3. Regular Consumption: Consistency Determines Effect

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Positive effects are seen when moringa leaves are consumed regularly in the daily diet, as recorded in the pre-post study by Cahyaningsih et al: a significant increase in body weight and height within a few weeks of consistent consumption .

4. The Role of Diversification and Education

Moringa leaf pudding can increase children's acceptance of essential nutrients because of its appealing shape and taste. The educational approach accompanying this product innovation is very helpful, as observed in Langkat: acceptance and changes in consumption patterns have increased through the introduction of moringa foods in a fun and community-based manner.

5. Policy Implications and Program Development

These findings indicate that integrating moringa products (powder, extract, biscuits, pudding) into the PMT posyandu program, coupled with education for mothers/posyandu cadres, has the potential to reduce stunting rates in the community. Moringa-based products are cost-effective, locally available, and easy to mass produce.

6. Potential Obstacles

Some challenges include: children's taste preferences for moringa, its unfamiliar size, and low initial knowledge among mothers/the community. Therefore, familiar product innovations and community training are needed for widespread acceptance.

CONCLUSION

Moringa leaves (*Moringa oleifera*) have been proven to have very high nutritional content, including protein, calcium, iron, and vitamins C and A, which are essential for children's growth. Various studies show that moringa-based interventions in the form of extracts, powder, biscuits, and processed foods such as pudding can significantly increase children's weight, height, and nutritional status. Research results from various regions in Indonesia show that regular consumption of moringa leaves over a certain period of time significantly reduces the prevalence of stunting and improves children's anthropometric scores such as HAZ (Height-for-Age Z-score). In addition to being highly nutritious, moringa leaves are economical, easily available, and can be processed into various forms of food that children enjoy. Thus, moringa leaves are a potential, local, and sustainable alternative solution in efforts to prevent stunting, especially in areas with high stunting rates and limited access to other nutritious foods. However, the successful implementation of moringa leaf interventions requires support from all parties, including the government, health workers, posyandu cadres, and active family involvement. Education on the importance of balanced nutrition and innovation in moringa food processing are important factors in ensuring that the benefits of moringa leaves are widely accepted and felt by the community.

Therefore, the use of moringa leaves needs to be integrated into national policies for stunting prevention as a nutrition strategy based on local food ingredients.

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