



## ***Moringa Leaves as an Alternative Food in Efforts to Prevent Stunting: A Literature Review***

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### **ABSTRACT**

*Stunting is a growth and development disorder where the condition of the child is shorter than his age. Indonesia is still one of the countries with a high prevalence of stunting under five in Southeast Asia. Prevention of stunting requires efforts to fulfill nutrition in the First 1000 Days of Life (HPK) from pregnant women to babies aged 2 years. One of the foodstuffs rich in micro and macro nutrients is Moringa leaves. This literature study aims to review the results of research on Moringa leaves as a food ingredient in an effort to prevent stunting during pregnancy and lactation. This research is a type of literature study research by searching on Google Scholar in the last five years (2017-2021). The results of the study obtained that 5 literatures used stated a significant effect of Moringa leaves in preventing stunting. Moringa leaves can be processed as food that is rich in nutrients in the form of carbohydrates, proteins, fats, vitamins, minerals as an alternative to stunting prevention. Moringa leaves can be processed by extraction, made into flour, ice cream, or made into vegetables. Therefore, it is recommended for pregnant and lactating women to use Moringa leaves as food with high nutritional value.*

**Keywords: Moringa Leaf, Nutrition, Stunting**

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## **INTRODUCTION**

*Stunting is a growth and development disorder in which children are shorter than their age. Stunting is still an important problem faced by the world related to nutrition (Sulistyaningsih et al., 2021). Stunting is at risk of increasing child morbidity and mortality (Nugrawati et al., 2021).*

*Data in 2017 shows that around 150.8 million or 22.2% of children under five in the world are stunted. However, this figure has decreased compared to the stunting rate in 2000, which was 32.6%. In 2017, more than half of the world's stunted children came from Asia (55%), while more than a third (39%) lived in Africa. Based on data compiled by the World Health Organization (WHO), Indonesia is the third country with the highest prevalence of stunting under five in the Southeast Asia/South-East Asia Regional (SEAR) region (Komalasari et al., 2020). The Ministry of Health of the Republic of Indonesia reported an increase in stunting cases from 28.9% in 2014 to 30.8% in 2018. Although there was a decline in stunting cases in 2019 to 27.7%, this figure is still relatively high because WHO has determined the stunting rate in Indonesia. below 20% (Sulistyaningsih et al., 2021).*

*In order to strengthen commitments and action plans to accelerate nutrition*

*improvement, especially nutrition management since the First 1000 Days of Life (HPK) from pregnancy to children aged two years, various countries have made global efforts, namely the SUN (Scaling Up Nutrition). This movement is a response from countries globally to the condition of nutritional status in most developing countries and due to uneven progress in achieving the Millennium Development Goals (Kusumawati et al., 2021).*

*Nutrition in 1000 HPK provides an opportunity for efforts to increase human resources to become a priority for all cross-sectors related to malnutrition (Husnah, 2017). If this period is not used properly, there will be permanent damage (window of opportunity). The impact is not only on physical growth but also on mental and intelligence development as adults will be seen from the physical size that is not optimal and the quality of work that is not competitive, resulting in low productivity and the economy (Al Rahmad, 2019).*

*Growth and development was very rapid in the golden age. Efforts to improve nutritional status to build quality human resources must be started as early as possible, from the beginning of the life of the fetus in the womb. Adequate nutrition, macronutrients and micronutrients are needed to avoid or minimize the risk of stunting (Nurlaela et al., 2018).*

*Risk factors for stunting include the nutritional status of pregnant women. Pregnant women with anemia and KEK are at risk of causing Inhibited Fetal Growth (IPM), Low Birth Weight (LBW), small, short, thin, low immune system and the risk of death (Alfarisi et al., 2019). Based on the results of the 2018 Basic Health Research (Riskesdas), the incidence of anemia increased from 37.1% in 2013 to 48.9% in 2018. This increase was due to poor nutrition and maternal health during pregnancy. Likewise, in 2018 the prevalence of CED risk in pregnant women (15-49 years) was still relatively high at 17.3% compared to most SEZs during the last two years, namely 16.2% in 2016 and 14.8% in 2017. (Astiani et al., 2021).*

*One of the important efforts in preventing stunting is to meet the nutritional needs of 1000 HPK. One alternative food that is rich in nutrients is Moringa leaves.*

*However, there are still many Indonesian people who have not taken advantage of it. The purpose of writing this article is so that the Indonesian people can use Moringa leaves to prevent stunting.*

#### **METHOD**

*This research is a type of literature study research. The database used in conducting the search is Google Scholar in the last five years (2017-2021). The keywords used in conducting the search were “stunting prevention”, “moringa leaf”, and “Indonesia”. The criteria for articles are limited to the last 5 years, written in Indonesian or English, are original research, and full text is available.*

**RESULTS**

Based on the search conducted, 6 articles were obtained as follows:

Table 1. Article Summary

Author	Title	Method	Results
(Rohmawati et al., 2019)	Moringa Ice Cream: Innovation Products as an Effort to Prevent Stunting in the First 1000 Days of Life (HPK)	Product innovation of Moringa ice cream processing made from Moringa leaf flour. Implementation of activities through several stages, namely: (1) production training; (2) assistance in the management of P-IRT/SP; (3) business financing and marketing management training; (4) production to marketing assistance.	Based on the activities carried out, the Moringa ice cream product has obtained a distribution permit. Moringa leaf flour which is processed into Moringa ice cream contains high nutrients, especially protein and calcium. Moringa ice cream is one of the local food product innovations to overcome stunting.
(Rahayu et al., 2018)	Improving the Nutritional Status of Toddlers Through Giving Moringa Leaves (Moringa Oleifera)	The design of this study was a quasi-experimental with one group pre-posttest design. The sample in this study were toddlers with a Z-Score at BB/U <-2SD as many as 30 respondents. Data analysis using Wilcoxon Signed Rank Test.	The results showed that there was an effect of giving Moringa leaves on the nutritional status of toddlers based on Body Mass Index by Age (BMI/U). Moringa leaf consumption can increase BMI in toddlers
(Sukanti et al., 2020)	Moringa Ice Cream Innovation Products (Moringa oleifera Lam.) as an Effort to Prevent Stunting Jatisela Village, Gunung Sari District, West Lombok	Processing of Moringa ice cream innovation products is carried out through several methods, namely: (1) production training; (2) production and marketing assistance.	Moringa leaf ice cream making activities are quite good in helping the problems faced by partners, namely meeting nutritional intake to avoid stunting problems. as a plant resource that is relatively easy to find in this area, it can be used as raw material for innovative products in preventing stunting and fulfilling nutrition for pregnant women and children.
(Ulmy et al., 2020)	Effect of moringa leaves during pregnancy on growth and morbidity in 0-5 months	An intervention was given to pregnant women who were divided into 3 groups (the group given Moringa leaf powder, the group given Moringa leaf extract, and the group given Moringa leaf extract). who received Fe + folic acid tablets) for 12 weeks.	All groups obtained the same measurement results from all indicators. Pregnant women who consume Moringa leaf flour every day for 12 weeks can avoid being underweight in their babies. Moringa flour and leaf extract can reduce pain in infants aged 0-5 months.

(Yunus et al., 2021)	Pasi Health Center Communication Strategy to the Samberpasi Village Community in Preventing Stunting in Early Childhood through the 1 Rumah 1 Moringa Program.	This study uses an exploratory qualitative descriptive approach with observation and interview methods to obtain information from informants.	Education about the benefits and nutritional content of Moringa leaves can be conveyed and well received by the community.
(Yuliani et al., 2021)	Utilization of Moringa Leaves as MP – ASI in Efforts to Improve the Nutritional Status of Toddlers.	Training was given to mothers about MP-ASI and processing local food ingredients made from Moringa leaves for MP-ASI.	Participants who have received education are able to understand the types of complementary food menus that can be made from Moringa leaves

## DISCUSSION

*Pregnant women need proper nutrition for the health of the mother and fetus. If the nutritional needs of the mother are not met, it has the potential to cause nutritional problems. Pregnant women need more nutrients than non-pregnant women. Malnutrition in pregnant women has a negative effect on the baby's birth weight. Maternal nutritional status during pregnancy also affects the incidence of stunting. The worst impact of malnutrition that occurs during pregnancy will cause initial damage to health, brain development, intelligence, schooling ability, and productive power that is permanent, irreversible. Thus the growth and development of the fetus can be determined by the condition of the nutritional status of pregnant women (Kasim et al., 2021).*

*Stunting is influenced by nutrition obtained from the fetus and infant during*

*the early stages of life after birth, but only appears after the child is born) around the age of two years. Stunting is caused by chronic malnutrition that occurs within 1000 days of life. So that the nutritional intake of pregnant women needs to be maintained so that the formation of optimal fetal growth and development (Sukenti et al., 2020).*

*Stunting is an indicator of the success of people's welfare, education and income. The impact is very broad ranging from the economic dimension, intelligence, quality, and the nation's dimensions that have an effect on the future of children. Children aged 3 years who were severely stunted ( $-3 < z < -2$ ) in boys had 15 points lower reading ability and 11 points for girls compared to those with mild stunting ( $z < -2$ ). This results in a decrease in intelligence (IQ), so that learning achievement becomes low and can not continue school. When looking for a job,*

*the chances of failing a job interview test are great and not getting a good job, which results in low income (economic productivity hypothesis) and unable to meet food needs. Therefore, children who suffer from stunting have an impact not only on being physically shorter, but also on their intelligence, productivity and achievements later in life, so that they will become a burden on the state (Supariasa & Purwaningsih, 2019).*

*One way to meet nutritional adequacy and prevent the increase in stunting cases is by providing nutritious food to early childhood and pregnant women. Moringa leaves are classified as food ingredients with a high level of nutritional adequacy such as protein, fat, carbohydrates, minerals, vitamins and amino acids which are secondary metabolites as alternative food in cases of malnutrition (Yunus et al., 2021). Moringa is a food that is rich in macro and micro nutrients. The content of high nutritional value in Moringa leaves can be used to meet the nutritional needs of breastfeeding mothers and toddlers during their growth period (Rahayu et al., 2018).*

*One strategy to improve the community's ability in terms of knowledge, attitudes and practices to be able to behave in a healthy way is by promoting health through learning with the community. The main purpose of this health promotion after*

*being given a promotion, the community can help themselves and can develop existing resources in the community according to local conditions and must also be supported by applicable and health-oriented public policies (Astuti & Sari, 2020).*

*Moringa leaf (*Moringa oleifera*) is a local plant and part of a type of Indian herbal medicine that is familiar in tropical and subtropical countries. Moringa leaves are one of 13 species belonging to the genus *Moringa*, and *Moringa* can grow in tropical and subtropical locations with temperatures around 25-35°C. Moringa leaves can be consumed directly by pregnant women as vegetables or processed into snacks or supplements; Moringa leaves contain high iron and vitamin C so they can help increase heme as an addition to hemoglobin in the blood (Rohmawati et al., 2019).*

*Moringa leaves have been widely used as an alternative food to overcome malnutrition, especially for children and infants. Some countries in Africa such as Ghana, Nigeria, Senegal, Ethiopia, East Africa, Malawi, and Benin provide Moringa leaf powder as a mixture of children's food. Malnutrition cases in several countries in Africa encourage the use of Moringa leaves as food because Moringa leaves are known to contain important nutrients for the growth of*

children. *Moringa* leaves are reported to contain vitamins A, C, and E. *Moringa* leaves are also known to contain total phenols, protein, calcium, potassium, magnesium, iron, manganese, and copper. *Moringa* leaves are also a source of phytonutrients such as carotenoids, tocopherols, and ascorbic acid. These nutrients can function as free radical scavengers when combined with a balanced diet. The results showed that *Moringa* leaves are rich in phytosterols such as stigmasterol, sitosterol, and campesterol. These phytosterol compounds are precursors for the production of the hormone estrogen. Increased production of the hormone estrogen can stimulate the proliferation of mammary glands for milk production. The use of *Moringa* leaves in nursing mothers can be one solution to overcome malnutrition in children under the age of 3 years. About 6 tablespoons of *Moringa* leaf powder can meet the needs of iron and calcium during pregnancy and lactation. In addition to *Moringa* leaves, other plant parts such as flowers and fruit also contain carotenoids that are beneficial for health (Rani et al., 2019). *Moringa* leaves can be used as an alternative source of protein and calcium that can meet the nutritional needs of pregnant women because they contain three times higher protein than whole cream milk powder or nine times yogurt

protein and calcium, 17 times higher than calcium in milk. Thus, *Moringa* leaves can be used as an ingredient to provide adequate nutrition for stunting sufferers (Sukenti et al., 2020).

One of the benefits that can be taken from the *Moringa* tree is in the leaves. *Moringa* leaves contain a variety of beneficial nutrients. The most superior content in this plant is protein, vitamin A ( $\beta$ -carotene), and high iron so it is good for consumption and can meet nutritional needs, especially in vulnerable groups. Not only that, *Moringa* leaves also contain various kinds of amino acids which are rarely found in vegetables. Another benefit of *Moringa* leaves is that it can improve the nutritional status of malnourished children. *Moringa* leaves can overcome the problem of malnutrition in various countries by adding it to the daily diet of children. Currently, many tropical countries are using *Moringa* leaves to overcome the problem of malnutrition in children and pregnant women. *Moringa* leaves can be consumed by humans, but not many Indonesian people consume them because the characteristics of *Moringa* leaves have a distinctive odor and are not liked. In rural areas, consumption of *Moringa* leaves is only limited to processed vegetables such as clear vegetables and fresh vegetables. *Moringa* leaves are not widely processed as

*functional food. Therefore, there is a need for innovation in processing Moringa leaves into a product that can be accepted by the community so that the nutritional content in Moringa leaves can be utilized by the body (Rahmawati & Adi, 2016).*

*Differences in nutrient content based on the type of drying applied to Moringa leaves are generally statistically significant. The difference is Fe between the blanching and withering, withering and drying methods. The Zn content which shows the difference is the blanching and drying methods. Other nutrients (Ca, Protein and Phosphorus) did not show any difference in either drying using the blanching drying method, withering or drying in the sun (Irwan, 2020).*

### **CONCLUSION**

*Moringa leaves have sufficient levels of nutrients to prevent stunting. The nutritional content in Moringa leaves includes protein, fat, carbohydrates, minerals, vitamins and amino acids which are secondary metabolites as alternative food ingredients. Moringa leaves can be processed by extraction, made into flour, ice cream, or made into vegetables. Therefore, it is recommended for pregnant and lactating women to use Moringa leaves as food with high nutritional value.*

### **RECOMMENDATIONS**

*Further studies are needed on the acceptance of Moringa leaves as a pagan ingredient in the wider community.*

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