

## THE EFFECTIVENESS OF GIVING MORINGA LEAVES TO INCREASE THE WEIGHT OF TODDLERS

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### ABSTRAK : EFEKTIFITAS PEMBERIAN DAUN KELOR TERHADAP PENINGKATAN BERAT BADAN BALITA

Latar Belakang: Balita merupakan usia anak yang paling sering menderita kekurangan gizi dan gizi buruk. Kebutuhan gizi untuk anak pada awal masa kehidupannya merupakan hal yang sangat penting. Gizi kurang dan gizi buruk pada balita berakibat terganggunya pertumbuhan jasmani dan kesehatan. Secara tidak langsung gizi kurang dan gizi buruk menyebabkan balita mengalami defisiensi zat gizi yang dapat berakibat panjang, yaitu berkaitan dengan kesehatan anak, pertumbuhan anak, penyakit infeksi dan kecerdasan anak seperti halnya karena serangan penyakit tertentu. Berdasarkan data terdapat 18 balita mengalami gizi kurang di Desa Mampree Kecamatan Syamtalira Aron Kabupaten Aceh.

Tujuan: Penelitian ini bertujuan untuk mengetahui efektivitas daun kelor terhadap peningkatan berat badan pada anak balita di Desa Mampree Kecamatan Syamtalira Aron Kabupaten Aceh pada September sampai Oktober 2022.

Metode: Intervensi yang dilakukan adalah dengan pemberian daun kelor pada balita selama 3 minggu berturut-turut sebanyak 1 mangkuk, kepada seluruh responden yang menjadi sampel dalam penelitian, dan akan dibandingkan dengan kelompok kontrol tanpa intervensi daun kelor. Jumlah sampel yaitu 20 orang kelompok intervensi, dan 20 orang kelompok kontrol. Data penelitian akan dianalisis dengan metode univariat dan bivariat.

Hasil: Berdasarkan hasil penelitian, dapat dilihat balita dengan intervensi daun kelor akan mengalami kenaikan berat badan yang lebih tinggi dibandingkan dengan kelompok kontrol. Pada kelompok intervensi mengalami kenaikan berat badan balita  $\geq 2$ kg sebanyak 80%, sedangkan pada kelompok kontrol hanya sebesar 15%.

Kesimpulan: Secara statistik dapat disimpulkan bahwa terdapat efektivitas pemberian daun kelor terhadap peningkatan berat badan balita di Desa Mampree Kecamatan Syamtalira Aron Kabupaten Aceh Utara.

Saran: Perlu diteliti tentang variasi pemberian olahan daun kelor yang dikombinasi dengan sayuran lain.

Kata Kunci : Daun kelor, Peningkatan berat badan, Balita

### ABSTRACT

Background: Toddlers are the age of children who most often suffer from malnutrition and malnutrition. Nutritional needs for children at the beginning of their lives are very important. Undernutrition and malnutrition in toddlers result in disruption of physical growth and health. Indirectly, malnutrition and malnutrition cause toddlers to experience nutritional deficiencies that can have long consequences, namely related to child health, child growth, infectious diseases and children's intelligence as well as due to certain diseases. Based on data, there are 18 under-five children experiencing malnutrition in Mampree Village, Syamtalira Aron District, Aceh Regency.

Purpose: This study aims to determine the effectiveness of Moringa leaves on weight gain in children under five in Mampree Village, Syamtalira Aron District, Aceh Regency from September to October 2022.

Methods: The intervention carried out was by giving Moringa leaves to toddlers for 3 consecutive weeks as much as 1 bowl, to all respondents who were sampled in the study, and would be compared with the control group without Moringa leaf intervention. The number of samples was 20 people in the intervention group, and 20 people in the control group. The research data will be analyzed by univariate and bivariate methods.

Results: Based on the results of the study, toddlers with Moringa leaf intervention will experience higher weight gain compared to the control group. In the intervention group, they experienced an increase in toddler weight of  $\geq 2$  kg as much as 80%, while in the control group only by 15%.

Conclusion: Statistically, it can be concluded that there is an effectiveness of giving Moringa leaves to increase toddler weight in Mampree Village, Syamtalira Aron District, North Aceh Regency.

Suggestions; It is necessary to study the variety of Moringa leaf preparations combined with other vegetables.

Keywords : Moringa leaves, Weight gain, Toddlers

## INTRODUCTION

Toddlers are the age of children who most often suffer from malnutrition and malnutrition. Nutritional needs for children at the beginning of their lives are very important (Fitriani, Friscila, et al. 2022; Pangaribuan, Simanullang, and Poddar 2020). Malnutrition can have inevitable adverse consequences, where the worst manifestations can lead to death. According to UNICEF, hundreds of millions of children in the world suffer from malnutrition, which means that this problem occurs in a very large population (Kemenkes RI 2020).

According to the World Health Organization (WHO) in 2020, about 45% of deaths among children under the age of 5 are related to malnutrition. This malnutrition occurs mostly in low- and middle-income countries. At the same time, in these countries, the rate of child overweight and obesity is also increasing. Malnutrition refers to the deficiency, excess or imbalance in a person's energy or nutrient intake (WHO 2020). Malnutrition is a considerable contributor to child mortality and morbidity. Child malnutrition further affects the country's economic development (Maayah et al. 2022; Mkhize and Sibanda 2020).

Based on Basic Health Research (Riskesdas) in 2018, organized by the Ministry of Health, states that the percentage of malnutrition in toddlers in Indonesia is 3.8%, while the percentage of undernutrition is 11.4%. The province with the highest percentage of malnutrition and undernutrition in children under five in 2018 is East Nusa Tenggara (Riskesdas 2018).

Based on data from the Aceh Health Profile in 2018, the number of cases of malnourished toddlers found was 640 cases, and cases of malnutrition of toddlers who received treatment were 173 people (27%). Cases of malnourished toddlers found in North Aceh Regency in 2018 were 492 people, and cases of malnutrition toddlers who received treatment were 23 people (5%) (Dinas Kesehatan Provinsi Aceh 2019).

Undernutrition and malnutrition in toddlers result in disruption of physical growth and health (Khan et al. 2022). Indirectly, malnutrition and malnutrition cause toddlers to experience nutritional deficiencies, which can have long consequences, namely related to child health, child growth, infectious diseases and children's intelligence, and

attacks of certain diseases. If this is left unchecked, of course, toddlers are very difficult to develop. Thus, it is clear that the problem of nutrition is a common problem, and all families must act or do to improve nutrition. Toddlers are included in the vulnerable group of nutrition, where at the age of 0–4 years is a time of relatively fast baby growth. And at this time is a period of great growth that will affect the further development of children (Lestari et al. 2022; Septiawati, Indriani, and Zuraida 2021).

Numerous studies have shown the important role of nutrients, not only in the physical growth of the body but also in brain growth, behavioral, motor and intelligence development. Children under five who do not get enough nutritionally balanced food have low resistance to disease, so they are susceptible to infection. Conversely, infectious diseases such as diarrhea and upper respiratory tract infections (ARI), can result in nutritional intake cannot be absorbed by the body properly, resulting in poor nutrition (Bappenas 2011).

Moringa is food that is rich in macro and micronutrients. Nutrients can be classified into macronutrients and micronutrients. Macronutrients are required in very high amounts for growth and development, including proteins, carbohydrates, and fats. Micronutrients are needed in less quantity, which contain vitamins and minerals (Patil et al. 2022). The high nutritional value content in Moringa leaves can be used to meet the nutritional needs of nursing mothers and toddlers who are in their infancy (Sokhela, Govender, and Siwela 2023). Moringa plants are easy to grow on all types of soil in tropical countries, with drought tolerance for up to 6 months. Moringa leaves have a high content of carbohydrates, protein, iron, calcium, vitamin C, vitamin A and potassium. Moringa leaves can be consumed directly as vegetables or as fortification of food ingredients (Aminah, Ramdhan, and Yanis 2018). *M. oleifera* is an underutilized vegetable that is now widely cultivated in many tropical regions of the world. Virtually every part of the plant, from the leaves to the roots, has been reported to possess potential health benefits. Different parts of the plant have also been utilized in various forms for food (Aderinola et al. 2020; Fitriani, Us, and Maayah 2022).

Moringa plants have many benefits for humans. Different parts of this plant are edible.

Moringa leaves are a part that contains many benefits. In general, it can be consumed because it contains nutrients and high protein. Traditionally, Moringa leaves are cooked and used like spinach. In addition to being used fresh instead of spinach, the leaves are usually dried and ground into powder, used in soups and sauces. All Moringa plants can be used for healing and improving the quality of human health, and especially the source of family nutritional intake. In fact, the content of moringa is known to be many times more than other food sources of nutrition (Kurniasih 2013). Lactating mothers are using moringa leaf extracts to increase their breast milk for their babies (Getachew and Admassu 2022).

Moringa leaves have the potential to be the main source of several nutrients and therapeutic elements, including antibiotics and spurring the immune system. Moringa leaves have a high protein, vitamin and mineral content that has therapeutic potential and additional food for malnourished children. The addition of Moringa leaves to children's daily diet is able to recover quickly because it contains 40 essential nutrients (Zakaria et al. 2013).

Based on data from the Syamtalira Aron Health Center in 2021, there were 1,121 toddlers who went to the children's room from January to June. Based on preliminary data obtained in Mampree Village, Syamtalira Aron District, North Aceh Regency, in 2021 from January to December, there were 215 toddlers. Of these, there are 21 toddlers who are malnourished, 12 toddlers are over nourished and 182 toddlers are under normal nutrition. Meanwhile, in 2022 from January to May, the number of toddlers in Mampree Village, Syamtalira Aron District, North Aceh Regency, is 65 children. Of these, there are 18 toddlers who are malnourished, 10 toddlers are over nourished and 37 toddlers are under normal nutrition.

The results of an initial exploration conducted on 10 mothers who have toddlers in Mampree Village, Syamtalira Aron District, North Aceh Regency, found that 7 mothers said they did not know the benefits of giving Moringa leaves to increase toddler weight, and never gave Moringa leaves to their toddlers, even by mixing them into food. 3 mothers said they knew the benefits of giving Moringa leaves to increase toddler weight, and had given their toddlers Moringa leaves by boiling Moringa leaves with other vegetables.

## RESEARCH METHOD

The type of research used is a pseudo-experiment or quasi experiment, with a design of Two-Group Post-test Only. Aims to determine the effectiveness of Moringa leaves on weight gain in children under five in Mampree Village, Syamtalira Aron District, Aceh Regency. This research has been carried out in Mampree Village, Syamtalira Aron District, North Aceh Regency. This research has been carried out from September 27 to October 24, 2022.

The population in this study was all toddlers in Mampree Village, Syamtalira Aron District, North Aceh Regency, totaling 40 people. The sample in this study is using purposive sampling techniques, namely sampling based on certain characteristics, traits or characteristics, with a minimum sample number of 40 people. 20 people each for the intervention group and 20 people for the control group.

Data collection was carried out by weighing toddlers, and observing the provision of Moringa leaves to toddlers for 3 consecutive weeks, as much as 1 bowl for all groups of respondents who were sampled in the study. Univariate and bivariate statistical data analysis is used to make conclusions.

## RESEARCH RESULT

### Univariate Analysis

Table 1  
Frequency Distribution of Toddler Age

Toddler Age	Intervention Group		Control Group	
	f	%	f	%
4	10	50	10	50
3	7	35	7	35
2	3	15	3	14
<2	0	0	0	0

**Table 2**  
**Frequency Distribution of Toddler Weight Increase**

Toddler Weight Increase	Intervention Group		Control Group	
	f	%	f	%
≥ 2 kg	16	80	3	15
<2	4	20	17	85

### Bivariate analysis

**Table 3**  
**Test Results of the Effectiveness of Moringa Leaves on Increasing Toddler Weight**

	Mean	<i>p-value</i>	Keputusan
Intervention Group	27.05	0.000	Ha accepted
Control Group	13.95		

### DISCUSSION

Based on the results of the study (Table 2), it can be seen that toddlers with Moringa leaf intervention will experience higher weight gain compared to the control group. In the intervention group, they experienced an increase in toddler weight of  $\geq 2$  kg as much as 80%, while in the control group only by 15%.

From table 3 shows that the average increase in body weight of toddlers given Moringa leaves is 27.05, and the average increase in body weight of toddlers who are not given Moringa leaves is 13.95. The results were a difference between the intervention group and the control group, where the value of the intervention group was higher than that of the control group. The result of the *p* value of 0.001 < 0.05, then a decision was made to accept  $H_a$  and reject  $H_0$ , so it can be concluded that there is an effectiveness of giving Moringa leaves on increasing toddler weight in Mampree Village, Syamtalira Aron District, North Aceh Regency.

From the results of the study, it was found that from 20 toddler body weights in the intervention group after being given an intervention in the form of moringa leaves, it was found that most toddlers experienced an increase in weight by 16 respondents (80%). In the control group that was not given Moringa leaf intervention, it was found that most toddlers experienced an increase in body weight of <2 kg as many as 17 respondents (85%). Researchers assumed that the increase in body weight in 16 respondents was due to the consumption of Moringa leaves for 3 consecutive weeks.

According to the researchers' assumptions, significant weight gain in the intervention group of 16 respondents (80%), was caused by the consumption of Moringa leaves as an additional food in addition to the staple food that had been given by the respondents' mothers. According to research results,

Moringa leaves contain vitamin A, vitamin C, vitamin B, calcium, potassium, iron, and protein, in very high quantities that are easily digested and assimilated by the human body. In fact, the amount is more than food sources that have been used as a source of nutrition for nutritional improvement. An adequate quantity and quality of dietary protein supply is an essential prerequisite for normal growth, whereas a protein intake below metabolic requirements can induce growth faltering, malnutrition and damage to the brain and other organs (Budury, Purwanti, and Fitriasari 2022; Koletzko et al. 2019).

Mean protein intake in early childhood was 58.3 g/d (Switkowski et al. 2019). Moringa leaves provide a high concentration of protein (10-50 g/100 g dried leaf) (Brar et al. 2022; Trigo et al. 2021). So with the consumption of 100 g Moringa leaves, it can meet more than 50% of toddlers' protein needs.

The growth of toddlers is influenced by gender and birth weight. Higher birthweight was also associated with greater satiety responsiveness among girls. Among boys, birthweight was unrelated to measures of appetite regulation (Boone-Heinonen et al. 2019; Friscila, Us, et al. 2022).

Moringa leaves have the potential to be the main source of several nutrients and therapeutic elements, including antibiotics and spurring the immune system. Moringa leaves have a high protein, vitamin and mineral content that has therapeutic potential and additional food for malnourished children. The addition of Moringa leaves to children's daily diet is able to recover quickly because it contains 40 essential nutrients (Rohmawati, Moelyaningrum, and Witcahyo 2019; Zakaria et al. 2013). Moringa oleifera Lam. leaves (MOLLS) are recognised as new raw food material with various nutritional factors and phytochemical components. Moringa leaves constitute a variety of bioactive compounds, such as phenolic, flavonoids, protein, polysaccharides, vitamins, minerals. These bioactive

compounds exhibit anti-inflammatory, anti-tumour, antibacterial, antioxidant, and anti-diabetic activities (Friscila, Noorhasanah, et al. 2022; Yang et al. 2023).

The results of this study are also in accordance with previous research conducted by Rahayu (2018), which examined improving the nutritional status of toddlers through the provision of Moringa leaves (*moringa oleifera*) with a type of quasi-experimental research with a one group pretest and posttest design. From the results of the study showed that the value was as large, it can be concluded that there is an influence of Moringa leaf giving on the nutritional status of toddlers based on Body Mass Index according to age (BMI / U) (Rahayu 2018).

This is in accordance with the theory of Aminah, et al. (2015), moringa is food that is rich in macro and micronutrients. The high nutritional value content in Moringa leaves can be used to meet the nutritional needs of toddlers in their growth period. Moringa leaves have a high content of carbohydrates, protein, iron, calcium, vitamin C, vitamin A and potassium. Moringa leaves can be consumed directly as vegetables or as fortification of food ingredients (Aminah et al. 2018).

## CONCLUSION

There is an effectiveness of giving Moringa leaves to increase toddler weight in Mampree Village, Syamtalira Aron District, North Aceh Regency. Giving processed Moringa leaves can increase toddler weight growth.

## SUGGESTION

It is necessary to study the variety of Moringa leaf preparations combined with other vegetables.

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