



## The Impact of Nutrition Education Using the "My Plate Model with Local Food Nutrition Cards" Mikuzikal Tool on Maternal Knowledge for Stunting Prevention

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### ORIGINAL ARTICLE

#### ABSTRACT

Stunting is a serious health issue in Indonesia, with a national prevalence of 27.7% in 2022. West Sulawesi ranks as the second-highest province with a prevalence rate of 35%, while in Mamuju Regency, the prevalence reaches 27.45%. Nutritional education is one of the strategies to improve mothers' knowledge in preventing stunting. This study aims to analyze the effect of nutritional education using the MIKUZIKAL tool ("My Plate Model with Local Food Nutrition Cards") on the knowledge of mothers with children aged 2-5 years in the working area of Puskesmas Bambu, Mamuju Regency. This study employs a quasi-experimental design with a one-group pretest-posttest approach. A total of 54 mothers with young children were selected as research subjects using the total sampling method. Data were collected through questionnaires and analyzed using the Wilcoxon sign rank test. The results show that 35 respondents (64.8%) experienced an increase in post-test scores, 13 respondents (24.1%) experienced a decrease, and 7 respondents (11.1%) had unchanged scores. Statistical analysis revealed a significant difference before and after the intervention ( $p = 0.001$ ). In conclusion, nutritional education using MIKUZIKAL positively influences the improvement of mothers' knowledge in preventing stunting. Therefore, this method can be recommended as an educational strategy in healthcare facilities to address stunting issues.

**Keywords:** Stunting, Nutritional Education, MIKUZIKAL, Mothers' Knowledge, Community Health Center.

#### ABSTRAK

Stunting merupakan masalah kesehatan serius di Indonesia dengan prevalensi nasional sebesar 27,7% pada tahun 2022. Sulawesi Barat menempati peringkat kedua tertinggi dengan angka 35%, sementara di Kabupaten Mamuju, prevalensinya mencapai 27,45%. Edukasi gizi merupakan salah satu strategi untuk meningkatkan pengetahuan ibu dalam pencegahan stunting. Penelitian ini bertujuan untuk menganalisis pengaruh edukasi gizi menggunakan alat MIKUZIKAL ("Model Isi Piringku dengan Kartu Gizi Pangan Lokal") terhadap pengetahuan ibu balita usia 2-5 tahun di wilayah kerja Puskesmas Bambu, Kabupaten Mamuju. Penelitian ini menggunakan desain quasi-experiment dengan rancangan one group pretest-posttest. Sebanyak 54 ibu balita menjadi subjek penelitian yang dipilih dengan metode total sampling. Data dikumpulkan melalui kuesioner, lalu dianalisis menggunakan uji Wilcoxon sign rank test. Hasil penelitian menunjukkan bahwa 35 responden (64,8%) mengalami peningkatan nilai post-test, 13 responden (24,1%) mengalami penurunan, dan 7 responden (11,1%) memiliki nilai yang tetap. Analisis statistik menunjukkan perbedaan yang signifikan sebelum dan setelah intervensi ( $p = 0,001$ ). Kesimpulannya, edukasi gizi menggunakan MIKUZIKAL berpengaruh positif terhadap peningkatan pengetahuan ibu balita dalam pencegahan stunting. Oleh karena itu, metode ini dapat direkomendasikan sebagai strategi edukasi di fasilitas pelayanan kesehatan untuk mengatasi masalah stunting.

**Kata Kunci:** Stunting, Edukasi Gizi, MIKUZIKAL, Pengetahuan Ibu, Puskesmas

## INTRODUCTION

Stunting is a condition in which toddlers experience growth disorders due to chronic malnutrition, especially during the first 1,000 days of life. Its impacts include impaired cognitive development, reduced intellectual capacity, and an increased risk of non-communicable diseases in adulthood (Idealistiana, & Farlikhatun, (2020; Dermawan, Mahanim, & Siregar, 2022; Masyithoh, & Kuswandi, 2023). According to the National Nutrition Status Study (SSGI), the prevalence of stunting in Indonesia reached 27.7% in 2022, affecting 4,558,899 children. West Sulawesi recorded a stunting prevalence of 35%, making it the province with the second-highest stunting rate nationally, after East Nusa Tenggara. In the Mamuju Regency, the prevalence of stunting was 27.45% in the same year (Kementerian Kesehatan Republik Indonesia, 2022).

One of the main causes of stunting is inadequate dietary intake. The WHO and UNICEF recommend exclusive breastfeeding for infants aged 0–6 months, followed by nutritionally balanced complementary feeding (MP-ASI) until the age of two, based on the "Isi Piringku" (My Plate) guidelines (WHO, 2024). Mamuju Regency has abundant food resources, including marine and agricultural products. However, food availability does not always correlate with healthy consumption patterns, highlighting the need for nutrition education to raise awareness of the optimal utilization of local food ingredients. The Indonesian government has implemented various strategies to reduce stunting, including the "Isi Piringku" nutrition education program, which replaced the outdated "4 Sehat 5 Sempurna" (Four Healthy, Five Perfect) model, as it was considered less relevant to modern nutritional science (Ayu, & Surahman, 2023; St.Hasriani, Pratiwi, & Asnuddin, 2023; Al Maajid et al., 2024).

Comprehensive intervention is crucial in addressing stunting, especially as Indonesia is expected to experience a demographic bonus by 2030. High-quality human resources (HR) will determine national productivity and economic growth. Therefore, proper nutritional intervention—from adolescence and pregnancy to early childhood—is essential for preventing stunting. This study aims to analyze the impact of nutrition education using MIKUZIKAL ("My Plate Model with Local Food Nutrition Cards") on increasing mothers' knowledge about stunting prevention. The findings of this research are expected to provide recommendations for more effective nutrition education programs to help reduce stunting rates in Indonesia.

## RESEARCH METHODS

This study used a quasi-experiment design with a one-group pretest-posttest design. This design involves one group that is given a pre-test (O), given education using the MIKUZIKAL tool (X), and then measured again through a post-test (O). The study subjects consisted of 54 mothers of toddlers who fulfilled the inclusion criteria, namely: 1). Having children aged 2-5 years registered at the Bamboo Health Centre, 2). Willing to be a respondent and follow all education sessions, 3). Can read and write, 4). Do not have cognitive impairment that can hinder understanding of the material. Exclusion criteria included mothers who were not willing to be respondents and could not fully participate in the education.

The study was conducted in the working area of Puskesmas Bambu, Batupannu Village and Buadao Village, Mamuju Regency, West Sulawesi, from February to December 2024. The research procedure used a pre-test conducted before the intervention to measure the initial knowledge of respondents then nutrition education with MIKUZIKAL was given in 3 sessions for 3 months, with a duration of 90 minutes per session and a post-test conducted 1 week after the last session to measure changes in knowledge. Data were obtained primary through questionnaires and processed through editing, coding and scoring. Statistical analysis, starting with normality test with Shapiro-Wilk and continued with analysis using Wilcoxon sign rank. This study has received ethical approval from the Ethics Committee of the Faculty of Medicine, Sultan Agung Islamic University Semarang with number: 296/VIII/2024/Komisi Bioetik.

## RESULTS

**Table 1.** Frequency of respondent characteristics.

Characteristics	Frequency (n)	Percentage (%)
<b>Age</b>		
Under 20 Years	2	3,7
20-35 Years	37	68,52
Above 35 Years	15	27,78
<b>Education Level</b>		
Elementary school	10	18,52
Junior High School	18	33,34
Senior High School	22	40,74
Diploma III	1	1,85
Bachelor	3	5,55
<b>Occupation</b>		
Housewife	46	85,18
Honorar	2	3,7
Private Employee	6	11,12

Table 1 shows the characteristics of respondents with ages under 20 years as many as 2 people with a percentage of 3.7%, respondents with ages 20-30 years as many as 37 people with a percentage of 68.52%, while ages over 35 years were 35 people with a percentage of 27.78%. Furthermore, the criteria for respondents' education level, there are respondents with elementary school education level as many as 10 people with a percentage of 18.52%, junior high school education level as many as 18 people with a percentage of 33.34%, junior high school / vocational high school education level as many as 22 people with a percentage of 40.74%, then respondents with Diploma III education level as many as 1 person with a percentage of 1.85% and finally respondents with Bachelor education level as many as 3 people with a percentage of 5.55%. While the criteria for respondents in terms of employment are dominated by respondents with housewives as many as 46 people with a percentage of 85.18%, honorary as many as 2 people with a percentage of 3.7% and respondents with private employees as many as 6 people with a percentage of 11.12%.

**Table 2.** Frequency distribution of respondents' knowledge level

Level of knowledge	Pre-test		Post-test	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Good	15	27,78	33	61,11
Enough	36	66,67	19	35,19
Less	3	5,56	2	3,70
Total	54	100	54	100

Table 2 shows the respondents' knowledge before and after being given education, based on the results of the pre-test, respondents with good knowledge were 15 people with a percentage of 27.78%, respondents with a sufficient level of knowledge were 36 people with a percentage of 66.67%, respondents with a lack of knowledge were 3 people with a percentage of 5.56%, It can also be seen that there is a change in the increase in the value of the level of knowledge in the good category from the pre-test to the post-test, which was previously 15 people with a percentage of 27.78% to 33 people with a percentage of 61.11%, then the level of knowledge is sufficient from 36 people with a percentage of 66.67% to 19 people with a percentage of 35.19%, then the level of knowledge is less than 3 people with a percentage of 5.56% down to 2 people with a percentage of 3.70%.

**Table 3.** The effect of providing education using the MIKUZIKAL tool 'Model Fill My Plate with Local Food Nutrition Cards'.

Pretest-Post Test	N	Mean	Total	p-value
Negative Value	13	16,69	217	0,001
Positive Value	34	26,79	917	
Same Value	7			
Total	54			

Table 3 shows the results after the provision of nutrition education using the tool 'MIKUZIKAL 'fill my plate with local food nutrition cards" on the knowledge of mothers of toddlers in preventing stunting in the Bamboo Health Centre Working Area there is a change or there is an influence on the level of knowledge of respondents, using the Wilcoxon sign rank test. The results obtained by respondents with negative values or decreased values from Pre-test to Post-test as many as 13 people, then there were respondents experiencing an increase in value from Pre-test to Post-test as many as 35 people, then there were 7 respondents with the same value after taking the Pre-test then getting education about the effect of nutrition education using the tool 'MIKUZIKAL 'fill my plate with local food nutrition cards" on the knowledge of mothers of toddlers in preventing stunting, so that the asymp.sig value ( $p = 0.001$ ) was obtained. Because the value of  $p < 0.05$ , therefore statistically there is a significant difference in knowledge, the level of knowledge before and after education, in the form of an increase in the knowledge of respondents, which means that the education provided has an influence on changes in respondents' knowledge.

## DISCUSSION

Although the prevalence rate of stunting in West Sulawesi Province has decreased from 35% in 2022 to 30.3% in 2023, this figure remains high. West Sulawesi Province still ranks second in Indonesia for the highest number of stunting (Pitoyo et al., 2022; Evawaty et al., 2023; Suryana, & Azis, 2023; Syafrawati et al., 2023; Komarulzaman et al., 2023; Aswi et al., 2024; Sani, Hariyoko, & Basyar, 2024). Therefore, more intensive efforts from various parties are still needed to continue reducing stunting cases. This aligns with WHO's global target for 2025, where reducing stunting is one of the six global nutrition targets and a key indicator in the Sustainable Development Goals (SDGs) related to Zero Hunger (WHO, 2014).

One of the main contributing factors to the high stunting rate is low maternal knowledge about nutrition. Therefore, many countries have prioritized educational programs for mothers to enhance their capacity to provide optimal care for their children from pregnancy until the age of two. This period is a critical phase for a child's cognitive and motor development, making it essential for parents to allocate resources—both knowledge and material support—to ensure optimal child growth (Kiik & Nuwa, 2020). Mothers play a central role in shaping their child's lifestyle, including parenting patterns, food choices, and appropriate nutritional intake. Moreover, they are also responsible for improving their family's overall health (Ramadhiani, Paradilawati, & Widyasari, 2023).

This study is consistent with research conducted by Girma et al., (2019) in rural Ethiopia, which found that children whose mothers had low nutritional knowledge were five times more likely to experience stunting than those with knowledgeable mothers (Girma, Fikadu, & Abdisa, 2019). Maternal health education as a caregiver is crucial in reducing stunting rates. A study in rural Tanzania also emphasized the importance of nutrition education for the community due to the low coverage of nutrition education in the region (Bundala et al., 2020). In addition, Fadare et al., (2019) emphasised that nutrition education for mothers should cover five main aspects, namely: The importance of colostrum feeding, Exclusive breastfeeding, Diarrhoea prevention and management, Child immunisation and Family planning (Fadare et al., 2019).

These findings also align with research and community service efforts conducted by St. Hasriani, Pratiwi, and Asnuddin in the "Isi Piringku" educational program at Posyandu Cempaka, Barru Regency (2023). The study revealed that maternal knowledge about toddler nutrition increased from 56% (pre-test) to 88% (post-test) after receiving education (St.Hasriani, Pratiwi, & Asnuddin, 2023).

## CONCLUSION

In conclusion, nutritional education using MIKUZIKAL positively influences the improvement of mothers' knowledge in preventing stunting. Therefore, this method can be recommended as an educational strategy in healthcare facilities to address stunting issues.

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