

GEMATI Program: Reducing the Incidence of Stunting

Anisa Oktiawati^{1*}, Arif Rakhman², Khodijah³, Ita Nur Itsna⁴

^{1,2,3,4}Faculty of Health Sciences, Bhamada University Slawi

*Correspondence: anisaoktiawati1586@gmail.com

Abstract: Chronic malnutrition can cause growth and development disorders in children. This case is named stunting. Stunting is often experienced by toddlers in Indonesia. One of the main concerns of Tegal Regency Government is the high incidence of stunting. Efforts to decrease the incidence of stunting with structured interventions involving the community, especially parents who have children below two years of age. The study aimed to assess the efficacy of the Gemati program, namely the community assistance movement in Tegal Regency. The study took a quantitative approach and used a pre-experimental design with a single-group pretest-posttest design. All of the respondents were mothers of toddlers who were small in height. The sampling method was a total sampling. The study's findings revealed an improvement in toddler mothers' knowledge and skills in detecting and preparing a balanced nutritional menu. The government and the community must collaborate to ensure that the stunting prevention program is carried out effectively in order to reduce stunting. The government determines the policies to control stunting and protect the rights of mothers and children, increasing food security and environmental sanitation, and giving health education about stunting continually. The Gemati program has to be implemented sustainably and applied to all villages that have a high incidence of stunting so that the acceleration of handling stunting in Tegal Regency can achieve the results optimally.

Keywords: Baduta (Bawah Dua tahun), Gemati, Stunting, Village's program

Submitted: 15 May 2025, revised: 7 June 2025, accepted: 9 June 2025, published: 23 July 2025

INTRODUCTION

Children grow and develop in accordance with their chronological age. They may face challenges at this stage due to chronic malnutrition, psychosocial stimulation, and exposure to infectious diseases, particularly during the First 1000 Days of Life (HPK), which lasts from fetus to two years old ([Vice President Republic of Indonesia, 2018](#)). This condition can result in stunting. Children are deemed stunted if their height falls below the negative two standard deviations (-2SD) of other children their age ([Ministry of Health of the Republic of Indonesia, 2018](#)).

According to [the World Health Organization or WHO \(2021\)](#), the incidence of stunting in 2020 was 22%, or 149.2 million people. The data from the Indonesian Toddler Nutritional Status Survey (SSGBI) show that the current incidence of stunting in Indonesia was 24.4%, or 5.33 million toddlers, in 2021, a drop from 2020, when the prevalence was 26.92%, or roughly 7 million stunted toddlers. However, the target of reducing stunting by 21.1% in 2021 has not been achieved because the prevalence of stunting is still 24.4%. The target for reducing stunting in 2024 was 14%, so to achieve it, a target reduction of 3.13% per year is set until 2024.

The incidence of stunting in Central Java Province based on SGGBI data in 2019 was 27.7%, or 156,549 stunted toddlers, while according to SSGBI in 2021, there was a decrease of around 6.8% to 20.9%, or 2,046,602 children under five years old (toddlers). Stunting or growth disorders were experienced by approximately 1 in 5 toddlers in Central Java in 2021. Cases of stunting in Tegal Regency: According to the data from [Ministry of Health of The Republic of Indonesia \(2021\)](#) and Susenas (National Socio-Economic Survey) data, Tegal Regency has the second-highest stunting

prevalence rate in Central Java after Wonosobo Regency. Based on SSGI data in 2021, the stunting incidence in Tegal Regency was 28.0%. This data had dropped from 30.6% in 2018 to 24.2% in 2019. but rose again in 2019 and in 2021 to 28.0%. This position is still above the average prevalence of stunting in Central Java Province of 20.9%. Data obtained from the Tegal Regency Health Office stated that there were 10,793 toddlers who experienced stunting in 2021.

Stunting must be avoided for toddlers because the negative impacts of stunting will not only be experienced by children today but also have an impact when they grow up. Nutritional problems, especially stunting in under three years of age, can affect their growth and development. The negative consequences that will be experienced in the future include impaired intellectual ability, sensitivity to noncommunicable diseases, reduced productivity leading to poverty, and the high chance of giving birth to babies with low birth weight ([Nutrition Landscape Information System, 2019](#)).

The current situation will be difficult for families because it will increase health costs. While the long-term impacts are below standard body proportions, increased risk of non-communicable disease infections, less than ideal learning skills, and lack of work efficiency ([Ministry of Health of the Republic of Indonesia, 2018](#)).

Child stunting must be prevented by several efforts, including maintaining health and adequate health care in the first thousand days of life, immunization, clean living habits, and examining baby development at the integrated health center. The main step to make changes is to educate the people about better eating patterns, starting from before becoming a mother (adolescent) and during pregnancy, and babies up to 2 years of age. After the child is born, give colostrum and continue with exclusive breastfeeding for 6 months. After the child is half a year old, the child is given a type of complementary food with balanced nutrition and continues with the arrangement of nutritious food that is adjusted, especially until the second year of the child's age ([Ministry of Health of the Republic of Indonesia, 2018](#)).

Yamansari Village is one of the villages in Tegal Regency and also has a high incidence of stunting. The data from the Public Health Office in Tegal Regency, obtained from the results of measuring children's height during February to March 2024 in Yamansari Village, showed that there were 101 children having very short height, while 254 children were in the short category. Based on the measurement of children's weight in Yamansari Village, it was found that 13 children were very underweight and 69 children were underweight. It was also recorded that 1 child was severely malnourished and 21 children were malnourished. It showed that Yamansari Village still had child health problems, especially related to nutrition and stunting. It is necessary to conduct an effective and efficient program to reduce the stunting incidence in Tegal Regency, especially Yamansari Village. Stunting is a problem that is rooted in the pre-conception age group or adolescents as prospective couples who will have children, pregnant and breastfeeding mothers, and the behavior of the children themselves. The roles of health workers who assist the community are also important, such as village officials and health cadres. Therefore, the program that will be implemented to accelerate the decrease in the incidence of stunting with targets including toddlers is the Community Assistance Movement program to reduce stunting rates in Tegal Regency, abbreviated as the GEMATI program.

METHODS

This study used a quantitative approach with a pre-experimental design: one group pretest-posttest. The aim was to evaluate the effectiveness of the GEMATI Program in increasing maternal knowledge and practices related to balanced nutrition to prevent stunting in toddlers. The intervention consisted of structured health education and training sessions targeting mothers of toddlers, focusing on knowledge of stunting prevention and preparation of balanced nutritional menus. The GEMATI Program was initiated to address the high prevalence of stunting in Yamansari Village, Tegal Regency, by empowering mothers as key caregivers through capacity-building activities. The participants were mothers of toddlers aged 6–59 months with short or very short height based on WHO anthropometric standards. A total sampling technique was used. The study was conducted at Posyandu Mawar 1–9 in Yamansari

Village, Lebaksiu District, Tegal Regency. Data collection and intervention implementation took place between February and March 2024.

The intervention included (1) health education using small-group discussions and interactive lectures; (2) demonstration of healthy menu planning using local food ingredients and food scales; (3) Provision of illustrated booklets containing material on stunting, nutritional needs by age, and examples of child feeding practices; and (4) accompaniment by posyandu cadres during routine growth monitoring. Mothers completed a pretest questionnaire before the intervention and a posttest afterward. Nutritional status was measured using the height-for-age index (Z-score) assessed by microtoise, child growth charts, and anthropometric tables.

The GEMATI Program is different from general stunting education because it combines structured education with hands-on menu planning using local food ingredients, ongoing mentoring by trained posyandu cadres, and the distribution of culturally appropriate educational materials (booklets). This comprehensive approach ensures that knowledge is translated into practical daily feeding behavior, which is often lacking in standard education efforts.

Inclusion Criteria: (1) Mothers with children aged 6–59 months. (2) Willing to participate in all educational sessions. (3) Able to read and write. (4) Children measured for nutritional status at the posyandu. Exclusion Criteria: (1) Mothers who did not complete the educational sessions. (2) Children with congenital or chronic conditions affecting growth. (3) Mothers who did not complete either the pretest or posttest.

Instruments and Validity: Instruments included a maternal knowledge questionnaire about stunting and nutrition and a nutritional status observation sheet. The questionnaire was developed based on WHO and Indonesian Ministry of Health guidelines and underwent content validation by three experts. Empirical validity was tested using item-total correlation with $r \geq 0.3$ as the threshold, using 20 respondents with similar characteristics.

RESULTS

The characteristics of mothers according to their age, occupation, and education are presented in [Table 1](#).

Table 1. Characteristics of mothers according to their age, occupation, and education in Yamansari Village (n = 73)

Category	Frequency (f)	Percentage (%)
Mother's Age		
Teenager (12-25 years)	11	15.1
Adult (26-45 years)	62	84.9
Mother's Occupation		
Factory Employee	1	1.4
Trader	2	2.8
Housewife	70	95.8
Mother's Education		
Elementary School	20	27.4
Junior High School	24	32.9
Senior High School	28	38.3
Company	1	1.4
Total	73	100

Table 1 shows that of the 73 mothers from whom data was collected, the majority were adults (26-45 years old), with 70 mothers (95.8%) working as housewives and 28 mothers (38.3%) having a high school/vocational school education.

a. Stunting Incidence (nutritional status based on weight/age of children)

The data collection was conducted on 73 mothers with 74 children, so there was 1 mother who had twins. Research results can be shown in Table 2.

Table 2. Stunting Incidence in Toddlers in Yamansari Village (n=74)

Category	Frequency (f)	Percentage (%)
No Stunting	40	54.1
Stunting	34	45.9
Total	74	100

From Table 2, it shows that 74 children were measured from Posyandu Mawar 1 to Mawar 9 in Yamansari Village. Most of the children are in the normal category, namely 40 children (54.1%), with a division of 3 children in the high category with a Z-score > +3 and 37 children in the normal category with a Z-score of -2 to +3. While there are 34 children (45.9%) who are stunted with a Z-score assessment result category of short (-3 to -2), there are 12 children (35.3%) and 22 children (64.7%) with a Z-score assessment result of very short (<-3).

b. The mother's level of knowledge before and after stunting education

Table 3. Level of Mother's Knowledge before and after Stunting Education

Level of Mother's Knowledge	Before Stunting Education		After Stunting Educaiton	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Good	25	34.3	63	87.3
Fair	43	58.9	10	13.7
Poor	5	6.8	0	0.0
Total	73	100	73	100

According to Table 3, the majority of mothers' knowledge before receiving nature education falls into the "fair" category, with 43 mothers (58.9%), and 5 mothers (6.8%) having insufficient knowledge. The table reveals that the majority of mothers' knowledge after their education is in the good category (63 mothers, 87.3%), the rest are in the fair category (10 mothers, 13.7%), and no mothers have insufficient knowledge after being educated.

c. The effect of education on mothers' knowledge about balanced nutrition and feeding children

Table 4. The effect of education on mothers' knowledge about balanced nutrition and feeding children

	Mean	Z	P value
Pretest	7.15	-3.572	0.000
Posttest	14.25		

Based on Table 4, it is clear that there is a considerable difference between the pretest and posttest results. The mean pre-test value is 7.15, while the post-test result is 14.25, indicating a 7.10 rise. The Wilcoxon sign yielded a p-value of 0.000, indicating that education has an impact on maternal understanding and child feeding in Yamansari Village (p-value < 0.05).

DISCUSSIONS

Characteristics of mothers based on age, occupation, and education

According to the study's findings, the majority of mothers (62 out of 73) were of adult age. The research conducted by [Nursa'iidah & Rokhaidah \(2022\)](#) explained that all mothers evaluated were of adult age, with up to 25 in early adulthood (26-35 years) and 40 in late adulthood (36-45 years). Age is the length of a person's life calculated from birth to the present. The older a person is, the more experience they will gain so that their knowledge will also increase ([Siregar, 2015](#)). The results showed that most mothers were housewives, namely 70 people (95.8%). The mother's employment status is a mother who does part-time work and earns income by raising and caring for her children at home. As a result of the mother's work, changes in family life also cause the care and attention of children to shift to caregivers or their own families. Currently, there are many women who work outside the home or only at home to meet their needs, one of which is the nutritional needs of children. Mothers who only stay at home or do not have jobs (IRT) are mothers who only do various housework. Various reasons have been found for this event, one of which is to realize their nature as a good wife or mother. Although the stay-at-home mothers have spent time for their children to become better emotionally and academically. On the other hand, the non-worker mothers have a lot of time to take care of their children ([Nursa'iidah & Rokhaidah, 2022](#)).

The other research from [Sari et al. \(2022\)](#) also stated that of the 92 mothers studied, the majority were housewives, 64 people (69.6%), and the rest were self-employed and private employees. This is also in accordance with a study from [Mutingah & Rokhaidah \(2021\)](#), which stated that most of them did not work (as housewives), as many as 55 people (74.35%), and the remaining 19 people had working status (25.7%). Housewife mothers have a lot of time, so they pay attention to the condition of their children and have a lot of time to care for their children, especially in preparing nutritional needs that have balanced nutrition.

The results of data collection showed that the level of education of mothers in Yamansari Village, Lebaksu District, is mostly in the secondary education category, as many as 52 people, divided into junior high school/MTs education 24 people and high school/vocational high school education (28 people). In line with research conducted by [Sari et al. \(2022\)](#), the level of education of mothers with toddlers is mostly high school/vocational high school, namely 31 people (33.7%) out of 92 people. This is also reinforced by the results of research from [Nursa'iidah & Rokhaidah \(2022\)](#), that the education of mothers with toddlers in Segara Raya Village, Bekasi Regency is also mostly secondary education, namely 43 people out of 65 samples studied. The education level is an activity of a person in improving their abilities, attitudes, and forms of behavior, both for present life and at the same time preparation for future life.

Education is a major factor in stunting in children. Long-term stunting can have a negative impact on children's health, including increased morbidity and disability ([Trihono et al., 2015](#)). [Aryati et al. \(2023\)](#) discovered a correlation between maternal education level and the incidence of stunting in

toddlers in Lampung Regency, with a p-value of 0.000, indicating that the higher the mother's education level, the less stunting her child experiences, and vice versa. [Husnaniyah et al. \(2020\)](#) discovered a p-value of 0.005 relationship between maternal education level and the frequency of stunting in toddlers, with the lower the mother's education level, the greater the risk of her child being stunted. Education is one of the characteristics that influences a person's comprehension; therefore, someone with higher education is more likely to accept the information offered ([Wawan & Dewi, 2011](#)). This is reinforced by [Ar-Rasily & Dewi \(2016\)](#) statement, which claims that education is a learning activity carried out by a person with the objective of increasing and developing knowledge and abilities, and it decides whether or not a person is easily able to receive or absorb information. So the higher the education level, the easier it is for someone to take knowledge or insight, and the lower the education level, the more inhibited they are in receiving information ([Bongga, 2019](#)).

Stunting incidents in toddlers

The research data showed that anthropometric measurements of TB/U were taken at Posyandu Mawar 1 to Mawar 9 in Yamansari Village. Most of the children were in the normal category, namely 40 children (54.1%), with a division of 3 children in the high category with a Z-score $> +3$ and 37 children in the normal category with a Z-score of -2 to $+3$. While there were 34 children (45.9%) who were stunted with a Z-score assessment result category of short (-3 to -2), there were 12 children (35.3%) and 22 children (64.7%) with a Z-score assessment result of very short (< -3).

Stunting refers to the situation in which a toddler's length or height is shorter than their age. A child is considered stunted if their length or height is less than the minus two standard deviations (-2 SD) of children of the same age, according to the WHO child growth criteria. Toddler stunting is a chronic nutritional condition caused by a variety of factors, including socioeconomic status, maternal nutrition during pregnancy, infant sickness, and lack of nutritional intake in infants ([Sartika et al., 2021](#); [Zurhayati & Hidayah, 2022](#)). This is consistent with research undertaken by ([Kusumawati et al., 2021](#)), which found that the majority of children, 95 (61.7%), did not experience stunting, whereas the remaining 59 (38.3%) did. This is because the mother's education level falls between moderate and high. The higher the mother's educational level, the greater her awareness of satisfying nutritional demands, resulting in better nourishment for the child. In addition to maternal education, many factors influence stunting in children, including early initiation of breastfeeding that is not carried out, exclusive breastfeeding that is not carried out, early giving of complementary foods before the age of 6 months, and poor food quality related to energy, protein, calcium, iron, and zinc intake, which have been linked to an increased risk of stunting. Additionally, children who have a history of low birth weight (LBW) or premature birth, are male, have a history of neonatal disease, have a history of infectious diseases, have frequent and recurring diarrhea, or have not received vaccinations may have their growth and development disrupted and stunted ([Nirmalasari, 2020](#)).

Level of mother's knowledge before and after being given education

The level of mothers' knowledge about balanced nutrition for children before being given education showed that most mothers during the pre-test had sufficient knowledge, namely 43 mothers (58.9%). On average, mothers of toddlers in Yamansari village know about stunting and balanced nutrition for children and their types, but do not yet know the frequency of feeding and the number of calories needed by children at each age, and the practice of feeding children. Several mothers of toddlers said they had received counseling about stunting from the Lebaksiu Health Center.

Previous researchers in their study stated that mothers' knowledge about toddler nutrition before being given education was in the sufficient category, with an average value of 69.43 ([Yanti & Agustin, 2022](#)). This was because most mothers had just had children, so they were not experienced in caring for children, and their knowledge was also minimal. Conversely, mothers who have more than one child will have good knowledge because they have experience caring for children before and more often get information about nutritional needs through health education from the health center or access information in the mass media. The similarity research was conducted by [Rohmah et al. \(2022\)](#), which

showed the results of the majority of mothers' knowledge in the sufficient category, as many as 66 (93%) of the 71 mothers studied. It was because the majority of mothers' education is in the basic education category (elementary and junior high school)—as many as 39 people, compared to those who have further education (high school and college)—so that mothers have difficulty in receiving and absorbing the information obtained.

Mothers were asked to fill out a pre-test questionnaire containing knowledge about stunting, nutrients, and examples of food, frequency of feeding, numbers of calories needed by children according to their age, and feeding practices for children before being given education about balanced nutrition for children. Mothers were asked to fill out the questions according to their understanding and knowledge. This aims for researchers to obtain data on the extent of knowledge possessed by mothers related to balanced nutrition and feeding practices for children. Mothers filled out the questions without the help of the media or anyone else. So that the scores and correct answer items between respondents differ even though many respondents fall into the same knowledge category.

The results of the research were that most respondents had sufficient knowledge with varying values. The researcher argued that the lack of knowledge about balanced nutrition and child feeding practices at the integrated health post is due to the lack of information provided. Only a few mothers received counseling on stunting and its prevention (balanced nutrition). In addition, most of the mothers' education levels are in the basic education category (elementary and junior high schools/MTs), which can cause differences in the ability to absorb information and remember and understand the information provided.

The results of the study on mothers of toddlers in Yamansari Village after being given education showed that the majority of mothers had knowledge levels in the good category, as many as 63 people (87.3%). This can be seen in that there was an increase in the knowledge of respondents who initially mostly had sufficient knowledge; after being given education about balanced nutrition for toddlers, the majority of respondents had good knowledge, and there was a change from having knowledge of respondents in the poor category to none. Most respondents had known about stunting, balanced nutrition for children and its types, but did not yet know the frequency of feeding and the number of calories needed by children at each age, and the practice of feeding children. From these results, it can be concluded that providing information about balanced nutrition and feeding children can increase the level of mothers' knowledge.

The respondents filled out the post-test questions after receiving the health education. These questions were the same as the questions used when respondents took the pretest. Respondents worked on the questions with increased knowledge after previously being given education. The results obtained in this post-test showed satisfactory results where there was a change in the category from the majority in the sufficient category to good. The higher knowledge and quality of the mothers in preparing nutrition for the children through good feeding practices can reduce the incidence of stunting.

[Rehena et al. \(2021\)](#) in their study on the impact of nutrition education on the knowledge of mothers about stunting in Kamal Village, West Seram Regency. After being given education, mothers' knowledge increased from the poor category to good, with an average value of 88.8. These results indicate that there was an increase in mothers' knowledge after receiving counseling on the stunting definition, factors that cause stunting, and how to prevent and overcome stunting in toddlers. The mothers' knowledge about food and nutrition can affect mothers' behavior in choosing a variety of foods.

Based on the results of the study, the researcher assumed that the increase in knowledge that most respondents fall into the sufficient category becomes a good category because respondents have received information through the right method. The researcher argued that providing material using lectures, discussions, and booklets is an effective way that can be done as an effort to increase maternal knowledge. The researcher argued that the success of this study is due to the strong willingness of the *posyandu* (Integrated Health Center) cadres to obtain information. This discussion method makes mothers more focused on receiving information, and counseling is carried out in small groups at each *posyandu* so that the environment is more conducive when providing information. In addition, it is

necessary to prepare the information continuously and sustainably by cadres and health workers from the health center to further increase maternal knowledge.

The influence of education on mothers' knowledge about balanced nutrition and feeding their children.

The results of the study showed that there was an influence of education on mothers' knowledge of balanced nutrition in children with a p-value of 0.000 (<0.05). This proves that providing education about balanced nutrition to children with demonstration methods and booklet media are both effective in increasing mothers' knowledge in preparing healthy food for children with stunting. This study showed that health education using the demonstration method was also effective in increasing mothers' knowledge in preparing food with balanced nutrition. According to [Husnaniyah, et.al \(2020\)](#) stated that respondents will find it easier to learn concrete things than abstract ones. This is in accordance with the opinion of [\(Smale-Jacobse et al., 2019\)](#) namely that the more five senses are used, the clearer the understanding or understanding obtained so that respondents are able to understand certain information.

In addition, the results showed that education using booklets is also effective in improving respondents' knowledge, according to the results of research from [\(Yulianti, 2014\)](#) about booklets that improve skills in disease prevention because respondents are interested in the appearance of the booklet media and easily understand the contents of the material. Booklet media is a thin book with complete information, which makes it easy for the media to be carried [\(Rehusisma et.al, 2017\)](#). It contains clear, firm, and easy-to-understand information besides also containing writing and pictures [\(Suiraka & Supariasa, 2012\)](#). This is similar to research conducted by [Wibowo & Suryani \(2013\)](#) that found there was an influence on respondents' knowledge after health education using the pocketbook method.

This study was limited to a single village with a relatively small sample size and without a control group, which may limit the generalizability of the findings. Future studies should consider using a quasi-experimental or randomized control design across multiple locations.

The GEMATI Program offers a replicable model for integrated nutrition education at the community level. Health practitioners, especially nurses and cadres, can adopt the program's framework to improve maternal knowledge and practices in stunting prevention. Integration with posyandu activities can enhance sustainability and community ownership.

The use of demonstration methods can be done if there are teaching aids. The use of teaching aids is intended to mobilize as many senses as possible on an object so as to facilitate understanding. In this balanced food preparation education for children, teaching aids are used in the form of food ingredients and food scales, and booklets are also provided containing pictures and sentences about the material presented. The use of teaching aids in demonstrations and the provision of booklet media enable mothers to see the suitability of theory with reality and to be able to do it themselves.

CONCLUSION

Mothers who have toddlers have received training on stunting and also skills in preparing balanced nutrition to prevent children from experiencing stunting. There was an increase in knowledge of mothers who have toddlers about stunting, characteristics of stunting, causes of stunting, and skills in choosing a food menu to prevent stunting. Mothers who have toddlers need to be accompanied by posyandu cadres and supported by local health services in order to optimize supervision of children in terms of growth and development until children avoid stunting. Provision of additional food for toddlers must be supported by the local government so that children's nutrition is sufficient for good growth and development. The distinctive feature of GEMATI lies in its combination of education, practical skill-building in menu planning, and continuous community mentoring by trained cadres, which strengthens the sustainability and practical impact of stunting prevention efforts.

ACKNOWLEDGEMENTS

We would like to convey our appreciation to all participants, the rectors and managerial staff at Bhamada University, and also the Regional Planning and Development Agency of Tegal for funding of this research project

AUTHOR CONTRIBUTION

Anisa Oktiawati1 (AO), Arif Rakhman (AR), Khodijah (K), Ita Nur Itsna (INI)
AO and AR contributed to the proposal preparation, research permit, ethical testing, data collection, data presentation, and discussion. K and INI contributed to data collection discussion, and writing references. Author 3 contributed to data processing

FUNDING

This research was funded by the Regional Planning and Development Agency of Tegal Regency. Proven by the existence of the Self-Management Implementation Decree on the Procurement of Stunting Handling in the Tegal Regency Area "GEMATI Stunting" with Number: 130/Univ-Bhamada/LPPM/IX/2024

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Bhamada Slawi University Ethics Committee granted ethical permission (No. 030/Univ.Bhamada/KEP.EC/III/2025). Every technique was used in compliance with the applicable rules and regulations. Every participant gave their informed consent to take part.

COMPETING INTERESTS

The authors declare that there was no conflict of interest.

REFERENCES

- Ar-Rasily, O. K., & Dewi, P. K. (2016). Factors that Influence Parental Knowledge Regarding Genetic Disorders that Cause Intellectual Disabilities di Semarang City. *Jurnal Kedokteran Diponegoro*, 5(4). <https://doi.org/10.33221/jiki.v9i03.353>
- Aryati, D., Irianto, S. E., & Karyus, A. (2023). Analysis of Factors Influencing The Incidence of Stunting for Toddlers di Lampung Utara Regency. *JPKM: Jurnal Profesi Kesehatan Masyarakat*, 4(2), 155–163. <https://doi.org/10.47575/jpkm.v4i2.492>
- Bongga, S. (2019). Factors That Influence Primigravida Mother's Knowledge About Early Breastfeeding Initiation (IMD) at the Sa'dan District Health Center North Toraja in 2018. *MPPKI (Media Publikasi Promosi Kesehatan Indonesia): The Indonesian Journal of Health Promotion*, 2(2), 93–98. <https://doi.org/10.31934/mppki.v2i2.563>
- Husnaniyah, D., Yulyanti, D., & Rudiansyah, R. (2020). The Relationship of The Knowledge Level and Incidence of Stunting. *The Indonesian Journal of Health Science*, 12(1), 57–64. <https://doi.org/10.32528/ijhs.v12i1.4857>
- Kusumawati, D. D., Budiarti, T., & Susilawati. (2021). The Relationship between Education Level and the Incidence of Stunting in Toddlers. *Stiker Al Irsyad Al Islamiyyah Cilacap*, 6(1), 2598–3857.
- Ministry of Health of the Republic of Indonesia. (2018). *Bulletin of Stunting*.
- Ministry of Health of the Republic of Indonesia. (2021). Pocket Book of Indonesian Nutritional Status Study Results (SSGI) at National, Provincial, Regency/City Levels in 2021. Ministry of Health of the Republic of Indonesia, Jakarta. <https://repository.badankebijakan.kemkes.go.id/id/eprint/4899>
- Mutingah, Z., & Rokhaidah, R. (2021). The Relationship Between Maternal Knowledge, Attitude and Stunting Prevention Behavior in Toddlers. *Jurnal Keperawatan Widya Gantari Indonesia*, 5(2), 49. <https://doi.org/10.52020/jkwgi.v5i2.3172>
- Nirmalasari, N. O. (2020). Stunting in Children: Causes and Risk Factors of Stunting in Indonesia . *Qawwam: Journal For Gender Mainstreaming*, 14(1), 19–28. <https://doi.org/10.20414/Qawwam.v14i1.2372>

- Nursa'iidah, S., & Rokhaidah. (2022). Education, Occupation and Age with Knowledge of Mothers of Toddlers About Stunting. *Indonesian Journal of Health Development*, 4(1), 9–18.
- Nutrition Landscape Information System. (2019). Country Profile Indicators Interpretation Guide. In *Nutrition landscape information system (NLIS) Country Profile* (2nd ed.). World Health Organization. www.who.int/nutrition
- Rehena, Z., Hukubun, M., & Nendissa, A. R. (2021). The Influence of Nutrition Education on Mothers' Knowledge about Stunting in Kamal Village, West Seram Regency. *Moluccas Health Journal*, 2(2), 62–69. <https://doi.org/10.54639/mhj.v2i2.523>
- Rehusisma, L. A, Indriwati, S. E , and Suarsini, E. (2017). Development of Booklet and Video Learning Media to Strengthen the Character of Clean and Healthy Living. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, Volume: 2 Nomor: 9 Halaman: 1238–1243. <https://scispace.com/pdf/pengembangan-media-pembelajaran-booklet-dan-video-sebagai-3bvvj8aoat.pdf>
- Rohmah, M., Mufida, R. T., & Agustina, R. (2022). Education on PMBA (Infant and Child Feeding) Practices to Increase Mother's Knowledge and Skills in Feeding as an Effort to Prevent Stunting. *Jurnal Kebidanan*, 11(2).
- Sari, N. A. M. E., Mirayanti, N. A. K., & Andriana, K. R. F. (2022). The relationship between maternal knowledge and attitudes in providing balanced nutrition with efforts to prevent stunting in toddlers. *Jurnal Keperawatan*, 14(S1), 27–38.
- Sartika, A. N., Khoirunnisa, M., Meiyetriani, E., Ermayani, E., Pramesthi, I. L., & Nur Ananda, A. J. (2021). Prenatal and postnatal determinants of stunting at age 0–11 months: A cross-sectional study in Indonesia. *PLoS ONE*, 16(7 July), 1–14. <https://doi.org/10.1371/journal.pone.0254662> PubMed: [34260622](https://pubmed.ncbi.nlm.nih.gov/34260622/)
- Siregar, Y. (2015). The Factors that Influence Mothers' Knowledge about Malnutrition for Toddlers Aged 2-5 Years in Siswo Mulyo Timur Hamlet, Kwala Begumit Village, Stabat District, Langkat Regency. *Jurnal Ilmiah Keperawatan IMELDA*, 1(1), 42–47.
- Smale-Jacobse, A. E., Meijer, A., Helms-Lorenz, M., & Maulana, R. (2019). Differentiated Instruction in Secondary Education: A Systematic Review of Research Evidence. *Frontiers in Psychology*, 10(November). <https://doi.org/10.3389/fpsyg.2019.02366> PubMed: [31824362](https://pubmed.ncbi.nlm.nih.gov/31824362/)
- Suiraoaka, I. P., & Supariasa, I. D. N. (2012). *Health Education Media*. Yogyakarta: Graha Ilmu.
- Trihono, Atmarita, Tjandrarini, D. H., Irawati, A., Utami, N. H., Tejayanti, T., & Nurlinawati, I. (2015). Stunted (Stunting) di Indonesia, Problem and Its Solutions. In *Badan Penelitian dan Pengembangan Kesehatan* (1st ed.). Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan. <http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484> <https://www.researchgate.net/publication/305320484> [SISTEM PEMBETUNGAN TERPUSAT STRATEGI MELESTARI](https://www.researchgate.net/publication/305320484)
- Vice President Republic of Indonesia. (2018). National Strategy to Accelerate Stunting Prevention 2018-2024. In *Vice President Republic of Indonesia*. https://www.globalfinancingfacility.org/sites/gff_new/files/Indonesia-GFF-Investment-Case-ENG.pdf
- Wawan, A., & Dewi, M. (2011). *Theories & Measurement of Knowledge, Attitude, and Human Behavior*. Yogyakarta: Nuha Medika.
- Wibowo, S., & Suryani, D. (2013). Effect of Health Promotion Audio Visual Method and Pocket Book Method on Increasing Knowledge of the Use of Monosodium Glutamate (MSG) in Housewives. *Jurnal Kesehatan Masyarakat (Journal of Public Health)*, 7(2), 67–74. <https://doi.org/10.12928/kesmas.v7i2.1040>
- World Health Organization. (2021). Child Malnutrition: Stunting Among Children Under 5 Years of Age. <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/72>
- Yanti, D. A. M., & Agustin, E. (2022). The Effect of Health Education on Toddler Nutrition on Mother's Knowledge. *Holistik Jurnal Kesehatan*, 16(6), 552–560. <https://doi.org/10.33024/hjk.v16i6.8287>

- Yulianti, I. (2014). Booklet to increase knowledge of eradicating mosquito nests (PSN) for dengue hemorrhagic fever (DBD) in Plumbungan Village, Karang Malang District, Sragen Regency. *Unnes Journal of Public Health*, 2(2). <https://journal.unnes.ac.id/sju/ujph/article/view/2993>
- Zurhayati, & Hidayah, N. (2022). Factors Associated with Stunting in Toddlers. *Journal of Midwifery Science*, 6(1), 1–10. <https://doi.org/10.36341/jomis.v6i1.1730>