



The Effect of Interactive Education Program in Preventing Stunting for Mothers with Children under 5 Years of Age in Indonesia: A Randomized Controlled Trial

Siti Maryati¹, Pritta Yunitasari¹, Budi Punjastuti*¹

Department of Nursing, Diploma III Nursing Program, Politeknik Kesehatan Karya Husada Yogyakarta, Yogyakarta, Indonesia

Abstract

Edited by: Ana Vucurevic
Citation: Maryati S, Yunitasari P, Punjastuti B. The Effect of Interactive Education Program in Preventing Stunting for Mothers with Children under 5 Years of Age in Indonesia: A Randomized Controlled Trial. Open Access Maced J Med Sci. 2022 Feb 14; 10(G):260-264. https://doi.org/10.3889/oamjms.2022.7944
Keywords: Parenting program; Breastfeeding; Complementary feeding; Stunting; Intervention study
***Correspondence:** Budi Punjastuti, Prodi D III Keperawatan Politeknik Kesehatan Karya Husada Yogyakarta, Jl. Tentara Rakyat Mataram 11 B, Yogyakarta - 55231, Indonesia.
E-mail: budipunjastuti123@gmail.com
Received: 13-Nov-2021
Revised: 29-Jan-2022
Accepted: 04-Feb-2022
Copyright: © 2022 Siti Maryati, Pritta Yunitasari, Budi Punjastuti
Funding: This research did not receive any financial support
Competing Interests: The authors have declared that no competing interests exist
Open Access: This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)

BACKGROUND: Stunting is still a major public health issue that has had a direct impact on the country's growth and development. Parents play a significant role in tackling the nutritional intake of children, considering their impact on the selection and quantities of food products obtainable to children. However, there is currently no specific parenting education program targeted at stunting prevention in Indonesia.

AIM: This study aimed to assess the effect of interactive education programs on preventing stunting for mothers with children under 5 years of age in Indonesia.

METHODS: This study was conducted using a randomized controlled trial single-blinded at the Public Health Center Bantul, Yogyakarta, Indonesia, from January to November 2019. The participants included the mothers of children under 5 years of age and reported the main role of feeding the child at home. The parenting program comprises 12 session workshops, biweekly within 6 months. Regression models were used to evaluate the effect of the intervention on the outcome by intervention group over time (from baseline to follow-up).

RESULTS: This study enrolled 64 people, 32 in the intervention group and 32 in the control group. There were substantial main effects or interactions for sickness in the past week and an increase in age; children across all categories grew less stunted. Dietary diversity showed improvement for intervention caregivers compared to control. This was evidenced by improved ratings in the practice of more varied diets. The magnitudes of the effects on dietary diversity ranged from 0.30 to 0.53.

CONCLUSION: This study highlighted the effectiveness of educational programs on preventing stunting among children under 5 years of age. This study provides a new approach to stunting prevention, which can provide basic evidence of healthcare policy improvements in prevention programs in the local community.

Introduction

Stunting is still a major public health issue that had a direct impact on the country's growth and development. The World Health Organization has begun calling for global action to eliminate child stunting by 40% by 2025 [1]. Stunting accounted for 45% of child mortality in 2011 [2], and dietary deficiencies caused 405,700 deaths in 2015 [3]. Even though stunting is declining in low- and middle-income countries and many countries have met their Millennium Development Goals, there are still about 160 million stunted children globally. Indonesia is considered being among the countries with the highest number of stunted children. Stunting reached 35.6% in 2010, 37.2% in 2013, 29.0% in 2015, and 29.6% in 2017. Three out of ten children born in Indonesia are stunted children [4]. There is a consensus on the significance of proper nutrition, hygiene, and stimulation throughout the first 5 years of life, but few researchers are focusing on establishing specific age milestones [5], [6].

Parents, generally, play a significant role in addressing children's nutritional intake due to their influence on food choices and quantity, societal standards of eating behavior, and parent-child approach to socializing dietary patterns [7]. To deal with the problem, parenting programs were considered a successful strategy [8], [9]. Parenting programs can address the issues of stunting and stimulation by modifying caregiver habits [10]. A key component of caregiver behavior is proactive parenting [11], which means that even while following meal recommendations, parents arrange their intake according to kid indicators [12]. Previous studies have developed a parenting education program promoting age-appropriate diets which showed a positive impact on caregivers' behaviors, and weight and height of children [13], [14]. Another parenting program offered information on foods to serve, quantities, frequency, and responsiveness to child appetite and know what types exposed to high rates of stunting and inadequate nutritional variety among Indonesian children [15]. Another study also suggested incorporating hand wash before preparing food or feeding their children into

their parenting program [16], [17], [18]. However, there is currently no specific parenting education program targeted to stunting prevention in Indonesia that has a score of 707 for human development, country ranks within a medium-sized development group in 111 of 189 states and territories [19]. Thus, this study aimed to assess the effect of interactive education program in preventing stunting for mother with children under 5 years of age in Indonesia.

Methods

Study design

This study was conducted using a randomized controlled trial single-blinded at the Public Health Center Bantul, Yogyakarta, Indonesia, from January to November 2019. A randomized subset block was used to randomly assign mothers into either intervention or control group. The research assistant generated and concealed the allocation order for each block using sequentially numbered. The research team was blind to pre-randomization group allocation.

Intervention

This program was developed based on guidelines for additional nutrition [15] and previous parenting programs in Bangladesh [20]. The interactive education program included parenting practices related to the family's wellbeing, dietary (included responsive self-alimentation, a varied food intake with an animal-derived food, washes before eating and after defecation, and urination), communications skills, and stimulation play. Mothers also were provided training skills to demonstrate positive affection and to minimize harsh authority. The parenting program consists of 12 session workshops (four sessions about nutritional education, four session about parenting issues, and four sessions about children growth and development), biweekly within 6 months.

In the control groups, mothers were received routine care. This usually entailed getting home visits from government-paid family welfare aides who were taught to follow the government model, which included food and cleanliness themes (one appeared to have received training in child development). Because contraception was their main job, these aides normally did not come to the house until the child was 2 years old.

Sample

The sample in this study was mothers who have children under 5 years of age and reported the main role for feeding the child at home. The exclusion criteria

were children with particular dietary restrictions, chronic health illnesses (e.g., diabetes), or a developmental issue (e.g., autism) that affected eating and/or height.

G-Power Analysis Software version 3.1.2 was used to estimate sample sizes for detecting differences in outcome measures between the intervention and control groups, using an alpha of 0.05, a power of 0.80, and an effect size of 0.30. The minimum sample size of 278 individuals was collected for each of the two groups (139 intervention groups and 139 participants for the control group).

Instrument

Demographic data of mothers include age, gender, education, ethnicity, religion, current work or employment status, and monthly average income. Children's characteristics include age, sex, body weight, and height.

Mothers were questioned about their prior and current breastfeeding experiences, as well as the foods consumed the previous day. Mothers were asked to recollect what their children had eaten during the day, from the time the family got up until they went to bed. Only data regarding frequencies were gathered, but not amounts. The following food groups were evaluated [21]: Cereals, beans, fish/meat, egg, veggies, fruits, and milk. Biscuits, salt, and sugar were not included in the calculation.

Children's health and dietary patterns were assessed using questions about recent illness (e.g., diarrhea, fever, and cough), as well as assessments of the child's length. Short Seca mat measuring kits were utilized. For analysis, the measurements were taken twice, and then, the average was used. The Z-scores for the child's age and gender were calculated by international guidelines. The ages of the children were determined using immunization cards, which most families still had.

Procedure

The Institutional Review Board of the affiliated university approved this study. Participants who met the inclusion criteria were recruited through the community leader. During the recruitment process, researchers explained the goal of the study, the data collection process, as well as how their rights will be protected, such as maintaining their autonomy and privacy. They were required to sign a written consent form. Mothers in the intervention group attended 12 biweekly group interventions, whereas mothers in the control group received the intervention after post-test measurements were completed. A pre-test was conducted before data collection (baseline), post-test 1 (T1) immediately after the intervention, and post-test 2 conducted 3-months after T1 (T2).

Data analysis

Univariate analysis using mean and standard deviation (for continuous data) and frequency (for categorical data) was used to describe social demographic data. Differences between intervention and control group sample characteristics were evaluated using an independent t-test (in continuous variables) or Chi-square test (for categorical variables). Regression models were used to evaluate the effect of the intervention on the outcome by intervention group over time (from baseline to follow-up). The data were evaluated using a modified intention-to-treat approach with at least one post-baseline evaluation of both the interventions and the participants. SPSS Version 22 for windows was used to analyze the data.

Results

There were no research clusters lost to follow-up across time measurement from baseline to follow-up (Figure 1), and cluster size varied slightly between intervention groups and over time.

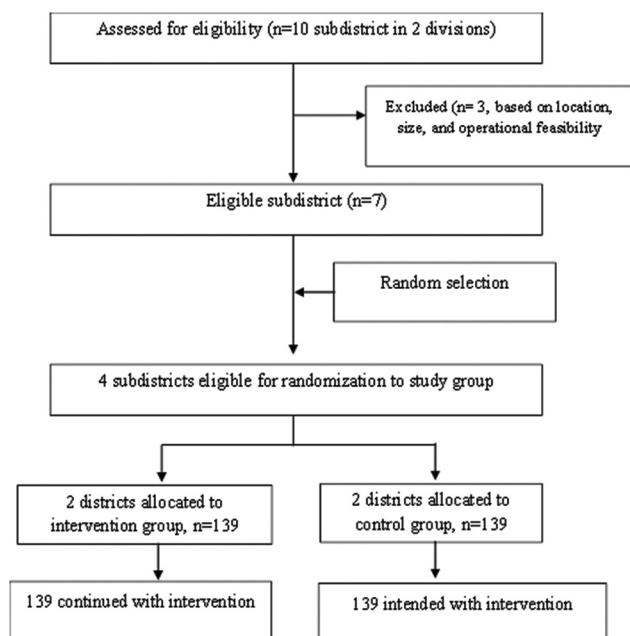


Figure 1: CONSORT (Trial flow and intervention timeline)

There were 278 participants in this study, 139 in the intervention group and 139 in the control group. Most respondents (75.5%) were married and housewives (75.5%). The average age of the intervention group is 32.45 years (SD = 10.37). Participants in the control group were 31.16 years old (SD = 9.04). Over 48% of participants in both the intervention and control groups had monthly salaries that were above the national average. The mean age of the children in the

intervention group was 12.51 months, while the control group had a mean age of 12.26 months. The majority of children were female. There was no significant difference between the groups in the demographic characteristics (Table 1).

Table 1: Characteristics of studied participants (n = 278)

Characteristics	Intervention group (n = 139)	Control group (n = 139)	p
Household factors			
Children aged <5 year, mean ± SD	2.17 ± 0.23	2.08 ± 0.32	0.654
Ownership of house, %	56.8	61.15	0.105
Ownership of garden, %	53.3	47.5	0.232
Ownership of agriculture land, %	49.6	46.0	0.731
Maternal factors			
Age (year), mean ± SD	32.45 ± 10.37	31.16 ± 9.04	0.107
Married, %	75.5	72.7	
Working status, %			
No	75.5	79.8	0.674
Yes	24.5	20.2	
Education level, %			
Primary education level	23.0	25.2	0.516
Secondary education level	56.1	53.2	
Tertiary education level	20.9	21.6	
Child factors			
Age (months), mean ± SD	12.51 ± 4.76	12.26 ± 5.04	0.372
Female, %	54.6	56.1	0.145

SD: Standard deviation.

In the past week, there were substantial main effects or interactions for sickness. Similarly, there was an increase in length for age; children across all categories grew less stunted. Dietary diversity showed improvement for intervention caregivers compared to control. This was evidenced by improved ratings in the practice of more varied diets. The magnitudes of the effects ranged from 0.30 to 0.53 (Table 2).

Table 2: Pre- and post-parenting program comparing control and intervention group

Characteristics	Intervention group (n = 139)	Control group (n = 139)	p
Sick past week, n (%)			
Baseline	52 (37.4)	44 (31.7)	0.036
T1	39 (28.1)	35 (25.1)	
T2	48 (34.5)	60 (43.2)	
Length-for-age (z), mean ± SD			
Baseline	-0.71 (1.7)	-0.69 (1.5)	0.003
T1	-0.85 (1.6)	-0.74 (0.98)	
T2	-1.05 (1.3)	-0.76 (1.01)	
Diet diversity (out of 7), mean ± SD			
Baseline	1.66 (1.03)	1.78 (0.82)	0.001
T1	2.03 (1.14)	1.90 (1.01)	
T2	3.08 (1.76)	2.21 (1.35)	
4 or more food categories, n (%)			
Baseline	26 (18.7)	39 (28.1)	0.045
T1	44 (31.6)	40 (28.8)	
T2	69 (49.7)	60 (43.1)	

SD: Standard deviation.

Discussion

The main results show that the parenting program prevents stunting among mothers in rural Indonesia. The intervention group is responsible for the generally successful mother understanding of diet diversity and children's health and nutritional status. In this region, the importance of promoting the advice for food diversity for the children must be highlighted. Thus, health-care providers need to highlight all such recommendations throughout regularly scheduled food and nutrition meetings of growth monitoring promotion at treatment facilities.

The majority of children's health and nutrition status indicators increased in the intervention group at follow-up compared to baseline. The previous research found that a parenting program can improve a major nutritional outcome for prevention in a high-risk population [22]. These findings corroborate preliminary research indicating that it is better to alter feeding practices thru educational interventions delivered by trained health professionals as part of regular preventative care [23], [24]. Expanding the parental program to include family planning and early pregnancy can increase women's exposure and care for stunting prevention.

The majority of the previous study relied on community-based healthcare practitioners to deliver parenting education, whereas this program was delivered by facility-based healthcare professionals [23], [24]. Lay health-care providers are typically located in the communities, where they provide care, and as a result, community programs should have cost information on the current procedure available. Counseling was provided to women who came to the health centers on their own, and interventions were monitored in the health centers. Because the number of women at intervention centers receiving nutrition counseling is higher than that at control centers, it may be concluded that nutritional assistance is now more accessible. We noted that the number of caregivers who were exposed to consultation in the intervention group was lower than anticipated. Insufficient counseling exposure was linked to low health center attendance. Follow-up visits were planned for each mother/child pair included in the intervention, however, only 35% of the caregivers from the interventions group showed up for the planned growth surveillance and promotional session the prior month. Inadequate child-centered counseling implementation in intervention centers could also have played a key role in this lower counseling exposure.

This study has some limitations such as the dietary measurement that was based on maternal records, which can lead to social desirability differences in reporting. Then, the intervention may then have reached only a limited group of highly educated women who were more aware of the importance of health center services, thereby decreasing the study's external validity.

Conclusion

This study found that the interactive education program was effective in preventing stunting for mother with children under 5 years of age in Indonesia. This study helps to bridge a knowledge gap in methodologically rigorous empirical investigations

of program sustainability. This study provides a new approach to stunting prevention in Indonesia, which can provide basic evidence of health care policy improvements in prevention programs in the local community and generally provide training programs for all communities through first-line healthcare services. Future studies could be carried out in different locations/regions in Indonesia with the same protocol with larger sample size and long-term follow-up.

References

1. de Onis M, Dewey KG, Borghi E, Onyango AW, Blössner M, Daelmans B, *et al.* The World Health Organization's global target for reducing childhood stunting by 2025: Rationale and proposed actions. *Matern Child Nutr.* 2013;9(Suppl 2):6-26. <https://doi.org/10.1111/mcn.12075>
PMid:24074315
2. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, *et al.* Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet (London, England).* 2013;382:427-51.
3. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015: A systematic analysis for the global burden of disease study 2015. *Lancet (London, England).* 2016;388:1459-544.
4. Indonesia NI of HR and D of M of H of the R of. The 2018 Indonesia Basic Health Survey (Riskesdas); 2018.
5. Crookston BT, Dearden KA, Alder SC, Porucznik CA, Stanford JB, Merrill RM, *et al.* Impact of early and concurrent stunting on cognition. *Matern Child Nutr.* 2011;7(4):397-409. <https://doi.org/10.1111/j.1740-8709.2010.00255.x>
PMid:21902807
6. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, *et al.* Maternal and child undernutrition: Global and regional exposures and health consequences. *Lancet (London, England).* 2008;371(9608):243-60. [https://doi.org/10.1016/S0140-6736\(07\)61690-0](https://doi.org/10.1016/S0140-6736(07)61690-0)
PMid:18207566
7. Golan M. Parents as agents of change in childhood obesity--from research to practice. *Int J Pediatr Obes.* 2006;1(2):66-76. <https://doi.org/10.1080/17477160600644272>
PMid:17907317
8. Engle PL, Black MM, Behrman JR, de Mello MC, Gertler PJ, Kapiriri L, *et al.* Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. *Lancet (London, England).* 2007;369:229-42.
9. Engle PL, Fernald LCH, Alderman H, Behrman J, O'Gara C, Yousafzai A, *et al.* Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet (London, England).* 2011;378(9799):1339-53. [https://doi.org/10.1016/S0140-6736\(11\)60889-1](https://doi.org/10.1016/S0140-6736(11)60889-1)
PMid:21944378
10. Walker SP, Wachs TD, Gardner JM, Lozoff B, Wasserman GA, Pollitt E, *et al.* Child development: Risk factors for adverse outcomes in developing countries. *Lancet (London, England).* 2007;369(9556):145-57.
11. Eshel N, Daelmans B, de Mello MC, Martines J. Responsive parenting: interventions and outcomes. *Bull World Health Organ.* 2006;84(12):991-8. <https://doi.org/10.2471/blt.06.030163>

- PMid:17242836
12. Black MM, Aboud FE. Responsive feeding is embedded in a theoretical framework of responsive parenting. *J Nutr.* 2011;141(3):490-4. <https://doi.org/10.3945/jn.110.129973>
PMid:21270366
 13. Bentley ME, Wasser HM, Creed-Kanashiro HM. Responsive feeding and child undernutrition in low-and middle-income countries. *J Nutr.* 2011;141(3):502-7. <https://doi.org/10.3945/jn.110.130005>
PMid:21270354
 14. Dewey KG, Adu-Afarwuah S. Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. *Matern Child Nutr.* 2008;4(Suppl 1):24-85. <https://doi.org/10.1111/j.1740-8709.2007.00124.x>
PMid:18289157
 15. World Health Organization. WHO/PAHO. Guiding Principles for Complementary Feeding of the Breastfed Child. Geneva: World Health Organization; 2000.
 16. Roy SK, Fuchs GJ, Mahmud Z, Ara G, Islam S, Shafique S, *et al.* Intensive nutrition education with or without supplementary feeding improves the nutritional status of moderately-malnourished children in Bangladesh. *J Health Popul Nutr.* 2005;23(4):320-30.
PMid:16599102
 17. Vazir S, Engle P, Balakrishna N, Griffiths PL, Johnson SL, Creed-Kanashiro H, *et al.* Cluster-randomized trial on complementary and responsive feeding education to caregivers found improved dietary intake, growth and development among rural Indian toddlers. *Matern Child Nutr.* 2013;9(1):99-117. <https://doi.org/10.1111/j.1740-8709.2012.00413.x>
PMid:22625182
 18. Aboud FE, Moore AC, Akhter S. Effectiveness of a community-based responsive feeding programme in rural Bangladesh: A cluster randomized field trial. *Matern Child Nutr.* 2008;4(4):275-86. <https://doi.org/10.1111/j.1740-8709.2008.00146.x>
PMid:18811792
 19. United Nations Development Programme. Sustainable Development Goals. New York: United Nations Development Programme. Available from: <https://www.undp.org/sustainable-development-goals> [Last accessed on 2019 Nov 19].
 20. Aboud FE, Akhter S. A cluster-randomized evaluation of a responsive stimulation and feeding intervention in bangladesh. *Pediatrics.* 2011;127(5):e1191-7. <https://doi.org/10.1542/peds.2010-2160>
PMid:21502222
 21. Daelmans B, Dewey K, Arimond M. New and updated indicators for assessing infant and young child feeding. *Food Nutr Bull.* 2009;30(2 Suppl):S256-62. <https://doi.org/10.1177/15648265090302S210>
PMid:20496619
 22. Bloomfield J, Fisher MJ. Quantitative research design. *J Australas Rehabil Nurses Assoc.* 2019;22:27-30.
 23. Imdad A, Yakoob MY, Bhutta ZA. Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries. *BMC Public Health.* 2011;11(Suppl 3):S25. <https://doi.org/10.1186/1471-2458-11-S3-S25>
PMid:21501443
 24. Sunguya BF, Poudel KC, Mlunde LB, Urassa DP, Yasuoka J, Jimba M. Nutrition training improves health workers' nutrition knowledge and competence to manage child undernutrition: A systematic review. *Front Public Health.* 2013;1:37. <https://doi.org/10.3389/fpubh.2013.00037>
PMid:24350206