STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

The Effect of Nutrition Education Intervention Towards Nutritional Behavior of Mother In Stunting Children: A Systematic Review

Aulya Kartini Dg Karra[1]*, Yuni Sufyanti Arief[1], Ririn Probowati[2]
[1]Universitas Airlangga, Surabaya, Indonesia
[2]STIKes Pemkab Jombang, Indonesia
** Correspondent Author: aulya_kartini@yahoo.com*

ABSTRACT
Stunting has become a global concern in the last decades, several studies have shown that one of the main causes of stunting is based on the knowledge of the mother. The aim of this study is the effect of nutrition education interventions on maternal nutritional behavior in stunted children. This method of compiling a systematic review is based on literature studies from various electronic databases, including Scopus, ProQuest, Science Direct, EBSCO, ResearchGate, and Google Scholar by conducting a review using the latest PRISMA. The keywords in this systematic study were unbeatable with the Medical Subject Heading (MeSH) consisting of (Maternal behavior OR maternal behavior AND nutrition education AND Growth Disorders OR stunting). 10 articles fit the inclusion criteria, the main results of the articles discuss maternal nutritional behavior. Appropriate nutrition education interventions are effective to prevent and improve the status of stunting children.

Keywords: Maternal Behavior, Nutrition Education, Stunting

Received December 12, 2020; Revised December 22, 2020; Accepted January 31, 2021

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

BACKGROUND

Stunting is chronic malnutrition due to insufficient nutritional intake for a long time, malnutrition in early childhood causes children to get sick easily, has not optimal posture as adults, reduced cognitive abilities in sufferers and malnutrition also increase the mortality rate in infants and children (MCA Indonesia, 2013). A lot of research involves the incidence of stunting related to mother and child behavior, especially on maternal habits and characteristics (Aubel, 2012). The main causes of stunting are mostly influenced by factors from the mother such as education, irregular monitoring of child growth, and incomplete immunization, as well as the lack of food diversity to meet the nutritional needs of children (Kim et al., 2017). Until now, there has been no summary of research on nutrition education in the prevention and management of stunting in children involving the mother's behavior.

Based on World Health Organization data, there are 162 million children under five who are stunted worldwide and it is one of the biggest problems that inhibit individual growth, 3 out of 4 stunted children in the world are in Sub-Saharan Africa and Asia. It is projected that in 2025 the stunting rate will reach 127 million if the problem is not immediately addressed (WHO, 2014). The high prevalence of stunting in the world causes stunting, underpinning mortality in children globally around 14-17% (Prendergast et al., 2014).

The WHO framework provides an overview of the causes of stunting and classifies them into four main proximal factors, two of which are the mother's lack of knowledge on the practice of breastfeeding and complementary feeding (Stewart et al., 2013). Lack of knowledge and awareness in mothers is a challenge to modify the behavior associated with stunting (Hall et al., 2018). Declaration at the beginning of the 21st century carried out by the United Nations is known as the Millennium Declaration in 2015 to eradicate poverty in the world. 189 countries were participating in the Millennium Development Goals (MDGs), one of the parameters related to reducing the incidence of stunting (IDAI, 2015).

Increasing individual knowledge in health education can be provided with nutrition education. Nutrition education for mothers with malnourished children is an effective and inexpensive strategy in fighting malnutrition in children (Awuuh et al., 2019). Nutrition education is a nutrition education practice to improve individual health to achieve behavior change.

This systematic review has the potential to play a role in improving the behavior of nutritional mothers of mothers who have stunted children. This systematic review aims to systematically review current evidence on the effect of nutrition education interventions on improving the nutritional behavior of mothers with stunted children. Based on the above description, it is necessary to have a summary of the effect of nutrition education interventions that have been implemented in increasing the influence of maternal nutritional behavior on stunted children, so that these interventions can be applied in improving the nutritional status of children.

METHODS

Search Strategy

The protocol used in this study used The Center for Review and Dissemination and the Joanna Briggs Institute Guideline as a guide in selecting and determining the quality of the summarized studies. This systematic review is evaluated with the "Preferences Reporting Item for Systematic Review and Meta-Analysis" (PRISMA) to select studies that are in line with the research objectives. The articles used are articles published in English from 2015 to 2020. The databases used to search for articles include Scopus, ProQuest, Science Direct, EBSCO, ResearchGate, and Google Scholar. The literature search starts on July 30 2020

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

until January 14, 2021. Literature searches are those published from 2015 to 2020. Keywords in this systematic review are adjusted to Medical Subject Heading (MeSH) consisting of (Maternal behavior OR maternal behaviors AND nutrition education AND Growth Disorders OR stunting).

Study Criteria

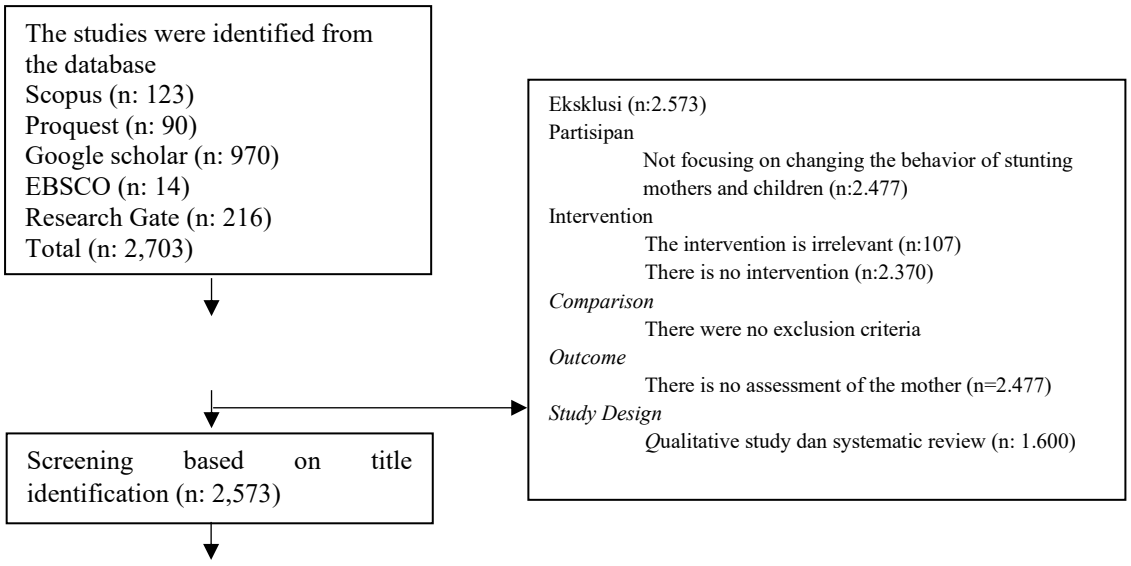
All articles found in the database are stored in Mendeley and duplicate articles have been removed. The study selection process consists of 4 phases: 1) reviewing all studies from the database based on title and abstract, 2) reviewing studies based on full text, 3) reviewing the reference list selected from phase 2, 4) the study is included if, type of publication: in a peer-reviewed journal, limited in English, type of study: consists of all experimental studies including RCTs and non-randomized experimental trials (eg quasi-experimental). Population: consisting of mothers who have stunted children, exposure: nutrition education intervention in mothers, outcome: study is included if one of the main outcomes is related to maternal nutritional behavior.

Data Extraction

Studies that meet the inclusion criteria are used to extract data into the data collection form. Follower extracted data: (1) study (year, country, design, quality); (2) population (sample, participant characteristics: mean age and condition of the child); (3) exposure (nutrition education intervention); and (4) assessment and results.

RESULTS

The search results used a predefined keyword chain resulting in 2,703 publications. In the first screening, the publication was excluded after reading the title based on inclusion/exclusion criteria. In total, 96 publications included the second screening. Of the 96 articles, 71 publications were excluded after reading the full text. The reasons for the exclusion are: (1) not focusing on changes in maternal behavior (2) irrelevant or no intervention (3) not by the expected research design, namely RCT and non-RCT (4) the main result does not include any nutritional behavior mother.



DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

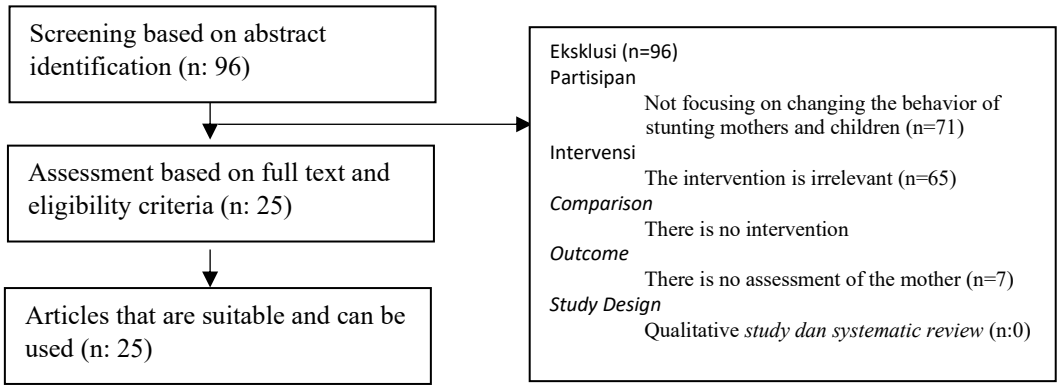


Figure 1. Flow diagram of Study Search and Selection Results

The research articles are limited from 2015 to 2020. 2 articles were published in 2016, 2 articles were published in 2017, 3 articles were published in 2018, 2 articles were published in 2019 and 1 article was published in 2020. The research design used was an article using the RCT design and non RCT (ex. Quasy experimental). The population in this study was 12-4436 respondents. The locations in this research are various countries, namely Indonesia, Iran, Ghana, and Bangladesh. The results of the review show that the entire article shows a significant effect on the effect of nutrition education interventions on improving maternal nutritional behavior in stunted children. Respondents in this study were mothers who had stunted children.
The study explains the effect of nutrition education interventions on improving maternal nutritional behavior in stunted children. The 10 articles selected for full-text review and review, are listed in table 1.

Table 1. Summary and research outcomes on the effect of nutrition education interventions on improving maternal nutritional behavior in stunted children.

Title and Author	**Method**	**Results**
The Effectiveness of Nutrition Education for Overweight/Obese Mother with Stunted Children (NEO-MOM) in Reducing the Double Burden of Malnutrition (Mahmudiono et al., 2018)	Design: RCT Sample: 66 Teknik sampling: randomly assigned Variable: Independent Variable: Nutrition Education Dependent Variable: Overweight/obese mothers with stunted children Intervention: Nutrition Education Analysis: a mixed factorial ANOVA IBM SPSS Statistics 22	66 mothers received nutrition education interventions resulting in a strong increase in maternal independence to engage in physical activity, eat fruits and vegetables, and to provide animal protein to their children to promote growth, but did not significantly affect children's height gain.
Impact of a nutrition education intervention on nutritional status of undernourished children	Design: Pre-post intervention study Sample: 153	This is a pre-post intervention study in children with undernourished status (underweight, stunting, and

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

Title and Author	Method	Results
(6-24 months) in East Mamprusidistrict of Ghana (Awuuh et al., 2019)	Tehnik Sampling: simple random sampling Variable: Independent Variable: Nutrition education intervention on nutritional status Dependent Variable: Undernourished children and mothers Intervention: Nutrition Education Analysis: Paired samples t-test Chi-square analysis	wasting) and their mothers aged 6-24 months. The results showed that there was a significant increase after being given nutrition education intervention in the nutritional status of malnourished children.
The Effect Of Booklet Education About Children Nutrition Needs Toward Knowledge Of Mother With Stunting Children (Suryati and Supriadi, 2017)	Design: Quasi-experimental with a non-equivalent control group with pretest and posttest Sample: 90 Tehnik Sampling: simple random sampling Variable: Independent Variable: Booklet Education About Children Nutrition Dependent Variable: Knowledge Of Mother With Stunting Children Intervention: Analysis: Wilcoxon and Mann Whitney	Based on the Wilcoxon test, it was found that maternal knowledge significantly increased ($p < 0.05$) after the intervention, from 29 (64%) categorized as moderate knowledge, increased to 34 (75.6%) categorized as good knowledge after the intervention. The results of the Mann Whitney test showed that the increase in maternal knowledge on the intervention and control groups was significantly different ($p < 0.05$).
Effect Of Nutrition Education Toward Stimulation Practices Of Stunting In Children Aged 12-24 Months (Helmizari et al., 2019)	Design: a quasi-experimental with non-randomized one group pretest postest Sample: 48 Tehnik Sampling: simple random sampling Variable: Independent variable: MP-ASI education in stunting mothers. Dependent variable : Maternal knowledge and attitudes, diet and energy and protein consumption levels of stunting baduta	The intervention group was given nutrition education intervention for one month which was provided in two sessions. For the first session, education will be given about complementary feeding and the second session about stimulation. The results showed that before the intervention, there was no significant difference in the two groups, the intervention group ($p = 0.078$) and the control group ($p = 0.575$),

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

Title and Author	Method	Results
	Instrumen/Intervensi: Nutrition education Analysis: paired sample t-test Wilcoxon Sign Rank test	after the intervention, the practice of maternal stimulation was significantly different, respectively p-value = 0.001 and P = 0.018.
The Effect Of Nutritional Counseling Using Booklet Media On Improvement Of Complementary Food For Breast Milk Knowledge In The Mother Of Toddler Stunting Age 6-24 Months (Muhimatul et al., 2019)	Design: Quasi Experiment by design pretest-posttest Control Group Design Sample: 42 Tehnik Sampling: purposive sampling Variable: Independent variable: Nutritional Counseling Using Booklet Media Dependent variable: The Mother Of Toddler Stunting Age 6-24 Months Of Complimentary Food For Breast Milk Knowledge Intervention: Nutritional counseling (Nutrition Education) Analysis: Paired sample t-test and independent sample t-test.	There is an effect of nutritional counseling using booklet media on increasing knowledge of complementary foods in stunting mothers of infants aged 6-24 months with a P-value of 0.000. There is a significant mean difference in the knowledge scores before and after the intervention in the two groups of Mean 8.81; 1.76 (p = 0.000; p = 0.001).
Smartphone-Based Maternal Education for the Complementary Feeding of Undernourished Children Under 3 Years of Age in Food-Secure Communities: Randomised Controlled Trial in Urmia, Iran (Sayyedi et al, 2020)	Design: RCT Sample: 110 Tehnik Sampling: simple random sampling Variable: Independent variable: Smartphone-Based Maternal Education Dependent variable: the Complementary Feeding of Undernourished Children Under 3 Years Intervention Smartphone-Based Maternal Education Analysis: Chi-Square Tests And An Independent T-Test	Smartphone-based maternal nutrition education in providing complementary foods is more effective in reducing malnutrition among children under 3 years in food-safe communities.

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

Title and Author	Method	Results
Nutrition Education for Overweight/Obese Mother with Stunted Children (NEO-MOM) (Mahmudiono et al., 2016)	**Design:** Randomized Controlled Trial **Samples: 66** **Variables:** **Independent variable:** Nutrition Education f **Dependent variable :** Overweight/Obese Mother with Stunted Children (NEO-MOM) **Intervention :** Nutrition Education	This study provides nutrition education interventions to mothers. The result of this study is that nutrition education given to mothers significantly influences the mother's behavior to be better at feeding stunted children.
The Effect of Nutritional Knowledge on Feeding Practice of Mothers Having Stunting Toddler Aged 6-24 Months (Dewi, Maryati; Aminah, 2016)	Design: quasi-experiment with pre-post test two group design Sample: 40 Sampling technique: purposive sampling Variable: Independen variable: Nutritional Knowledge on Feeding Practice Dependen variable: Mothers Having Stunting Toddler Aged 6-24 Months Intervention: Nutrition education Analysis: Wilcoxon test and Mann Whitney Test	There was a significant difference in the mean score of knowledge before and after intervention in the two groups (p = 0.006; p = 0.003), there was a significant difference in the mean score of feeding practice before and after the intervention in the two groups (p = 0.002; p = 0.05).)
Complementary Food Education, Attitude of Mother, and Energy-Protein Intake of Children Aged 7 to 24 Months Suffering from Stunting (Ilmanisak et al., 2017)	Design: pre-experimental method with one group pre and post-test Sample: 12 Sampling technique: saturated sampling Variable: Independen variable: Complementary Food Education, Attitude of Mother, and Energy-Protein Intake Dependen variable: Children Aged 7 to 24 Months Suffering from Stunting Intervention: Edukasi MPASI Analysis:	MPASI education interventions have an effect on increasing maternal knowledge and attitudes, diet, and consumption levels of stunting baduta protein and energy. Education provides an increase in maternal knowledge by 11.7%.

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

Title and Author	Method	Results
	Paired T-Test	
Cost-effectiveness of prenatal food and Micronutrient interventions on under-five mortality and stunting: Analysis of data from the MINIMat randomized trial, Bangladesh (Svefors et al., 2018)	Design: RCT Sample: 4436 Sampling Technique: Total Quota Sampling Variable: Independen variable: prenatal food and Micronutrient interventions Dependen variable: under-five mortality and stunting intervention: Maternal and Infant Nutrition intervention Analysis: Incremental cost-effectiveness ratios (ICERs) for DALYs averted	The provision of essential or nutritional interventions for mothers and babies in Matlab shows a significant effect on prenatal food and micronutrients in children under 5 years and stunted children.

Some data states that further research is needed by taking into account confounding factors. The risk of bias in this study is low because the assessment studies of bias in the study show that the results of the articles specified in the systematic review are considered low risk of selection. After all, most of the determinants of the sample is a random selection.

DISCUSSION

This systematic review discusses the relationship between nutrition education interventions on the nutritional behavior of mothers who have stunted children. 10 articles were reviewed, the limitation of this study is that most of the studies did not mention the age of the mother and child. Based on the results of the analysis of the articles obtained, nutrition education interventions have a significant impact on improving maternal nutritional behavior. Nutritional education interventions can increase the independence of mothers to be involved in providing food for children, such as involvement in physical activity in eating fruits and vegetables, giving animal protein to increase their growth, although nutrition education interventions do not significantly affect children's weight gain (Mahmudiono et al., 2018).

Research on 66 mothers who had stunted children in Indonesia showed significant results for changing maternal behavior for the better (Mahmudiono et al., 2018). Nutrition education is an inexpensive and effective strategy to help increase maternal knowledge in health education and prevent malnutrition in children (Awuuh et al., 2019).

Research conducted in Indonesia also with nutrition education interventions through booklet media and health promotion on the nutritional needs of children under five, which can reduce the number of children with stunted growth (Suryati and Supriadi, 2017). Nutrition education using smartphones to mothers who have stunted children is carried out in Iran, this education helps in increasing knowledge on complementary feeding in children and the results are shown to be more effective in reducing malnutrition among children under 3 years (Sayyedi et al., 2020).

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

Nutrition education for good mothers that focuses on increasing knowledge of exclusive breastfeeding and complementary feeding increases children's height and prevents children from gaining weight that is not optimal (Leroy et al., 2018). Involving mothers in the practice of complementary feeding to children greatly affects the reduction of the incidence of stunting (Kang et al., 2017).

One of the objectives of nutrition education to overcome malnutrition is the introduction of safe and sufficiently nutritious foods according to the principles in accordance by the guidelines recommended by WHO that nutrition for children with complementary feeding must be (1) on time, meaning that all babies must start receiving other foods besides breast milk from 6 months onwards; (2) adequate, in the sense that the nutritional value of complementary foods combined with breast milk must meet the needs of people who are rapidly developing children, and (3) appropriate, meaning that food must be diverse, safe, according to textured and quite abundant (Osendarp & Roche, 2016).

CONCLUSION

The systematic review was carried out by researchers examining 10 articles selected based on the inclusion criteria in this study. The findings show that the effect of nutrition education interventions can improve maternal nutritional behavior in stunted children. Further studies need to be conducted regarding this research.

ACKNOWLEDGMENT

Thanks to all those who helped in the process of making this manuscript

CONFLICTING OF INTEREST

This systematic review is written independently so that there is no conflict of interest in writing.

REFERENCES

Awuuh, V. A., Appiah, C. A., & Mensah, F. O. (2019). Impact of nutrition education intervention on nutritional status of undernourished children (6-24 months) in East Mamprusi district of Ghana. *Nutrition and Food Science*, *49*(2), 262–272. https://doi.org/10.1108/NFS-05-2018-0134

Dewi, Maryati; Aminah, M. (2016). Pengaruh Edukasi Gizi terhadap Feeding Practice Ibu Balita Stunting Usia 6-24 Bulan. *Indonesia Journal of Human Nutrition*, *3*(1), 1–8. kalteng.litbang.pertanian.go.id

Hall, C., Bennett, C., Crookston, B., Dearden, K., Hasan, M., Linehan, M., Syafiq, A., Torres, S., West, J., Health, I. M. A. W., & Indonesia, U. (2018). Maternal Knowledge of Stunting in Rural Indonesia. *International Journal of Child Health and Nutrition*, *7*(4), 139–145.

IDAI. (2015). Rekomendasi Praktik Pemberian Makan Berbasis Bukti Pada Bayi dan Balita di Indonesia Untuk Mencegah Malnutrisi. *Rekomendasi Praktik Pemberian Makan Berbasis Bukti Pada Bayi Dan Balita Di Indonesia Untuk Mencegah Malnutrisi*.

Kim, R., Mejía-guevara, I., Corsi, D. J., Aguayo, V. M., & Subramanian, S. V. (2017). Relative importance of 13 correlates of child stunting in South Asia: Insights from nationally representative data from Afghanistan, Bangladesh, India, Nepal, and Pakistan. *Social Science & Medicine*. https://doi.org/10.1016/j.socscimed.2017.06.017

Leroy, J. L., Olney, D., & Ruel, M. (2018). Tubaramure, a food-assisted integrated health and nutrition program, reduces child stunting in burundi: A cluster-randomized

DOI: 10.30994/sjik.v10i1.594
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 94-103

controlled intervention trial. *Journal of Nutrition*, *148*(3), 445–452. https://doi.org/10.1093/jn/nxx063

Mahmudiono, T., Al Mamun, A., Nindya, T. S., Andrias, D. R., Megatsari, H., & Rosenkranz, R. R. (2018). The effectiveness of nutrition education for overweight/obese mother with stunted children (NEO-MOM) in reducing the double burden of malnutrition. *Nutrients*, *10*(12), 1–16. https://doi.org/10.3390/nu10121910

Mahmudiono, T., Nindya, T. S., Andrias, D. R., Megatsari, H., & Rosenkranz, R. R. (2016). The effectiveness of nutrition education for overweight/obese mothers with stunted children (NEO-MOM) in reducing the double burden of malnutrition in Indonesia: Study protocol for a randomized controlled trial. *BMC Public Health*, *16*(1). https://doi.org/10.1186/s12889-016-3155-1

MCA Indonesia. (2013). Stunting dan Masa Depan Indonesia. *Millennium Challenge Account - Indonesia*, *2010*, 2–5. www.mca-indonesia.go.id

Osendarp, S. J. M., & Roche, M. L. (2016). Behavioral change strategies for improving complementary feeding and breastfeeding. *World Review of Nutrition and Dietetics*, *115*, 184–192. https://doi.org/10.1159/000442104

WHO. (n.d.). *Stunting in a nutshell*.