

# Systematic Review: Relationship between Infant and Young Child Feeding Practices with Stunting in Indonesia

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**Keywords:** Children, Feeding Practices, Indonesia, Stunting.

**Abstract:** Stunting affects deficits in cognitive development, more vulnerable to disease, and loss in productivity. One of main factors is inappropriate breast-feeding and complementary feeding practices. However, none of studies review about relationship between feeding practices and stunting in children. The aim of this study was to identify relationship between feeding practices and stunting among children in Indonesia. The systematic scoping review method was used in this review. The databases were electronic databases including; Google Scholar and Pubmed. Articles were searched by keywords and used bilinguals Bahasa and English. The inclusion criteria of studies were focused on relationship between feeding practices and stunting, published from 2017 to 2021, full text, and research implemented in Indonesia. A total of 1008 papers were retrieved, but only 18 articles met the inclusion criteria and were included in the analysis. The majority of the findings revealed that feeding practices have a substantial relationship with incident of stunting for infant and young children in Indonesia. This includes dietary variety, exclusive breast feeding, the time of introduction of complementary feeding, high iron feeding, and frequency of feeding. Comprehensive specific and sensitive nutrition intervention should be implemented equally to tackle stunting in Indonesia.

## 1 INTRODUCTION

Efforts to reduce child mortality and improve maternal health have become a global concern because they are the focus of public health development which is included in the Sustainable Development Goals (SDGs). This shows that children who should receive special attention. After the age of one year is included in the first 1000 days of life, children are still in rapid growth characterized by rapid organ and motor maturity. Bloom revealed that the growth of brain tissue cells can reach 50% in children aged 0-4 years old (Cropley, 1994). Children's brain synapses are like sponges that easily absorb information and connect with each other when stimulated. In Indonesia, around 37% or approximately 9 million children under five are stunted (Ministry of Health, 2013). The Basic Health Research year 2018 data revealed that there were 17.7% of Indonesian children under five experiencing severe malnutrition and malnutrition, this was certainly higher than the RPJMN target of 17% (Ministry of Health, 2018). While the proportion of children under two years old who are short and very short was 29.9%, this was certainly higher than the

RPJMN target of 28% and WHO's 20%. Toddler who experiences stunting will have less optimal cognitive abilities, causing children more susceptible towards disease and causing a decrease productivity levels. Another fact stated that in Bangladesh and Pakistan, the problem of malnutrition, including short children, reduces national income (GNP) by 2 percent - 4 percent annually (IFPRI, 2000). In the end, stunting will broadly inhibit economic growth, increase poverty and widen inequality. Based on the UNICEF Conceptual Framework, one of the causes of stunting in children under two is improper feeding practices. Research that was conducted by Black et al (2008) revealed that inappropriate breastfeeding and complementary feeding practices are the main cause of malnutrition and death during the first 2 years of life. If infants and children do not receive food according to their nutritional needs, then the golden period will become a critical period that will interrupt the growth and development of infants and children, in the present time and later on in the future. Therefore, the optimal practice of feeding infants and children become the major concern to support the development and the growth of the infants and children. However, studies on the association

between children feeding practices and stunting in Indonesia are still limited, especially those that use systematic reviews. This study aimed to analyze the association between child feeding practices and stunting from various studies in Indonesia.

## 2 LITERATURE REVIEW

### 2.1 Stunting

Stunting is a consequence of insufficient nutritional intake in an extended period of time due to feeding that does not match the nutritional needs which leads to a chronic malnutrition. Stunting arises during the fetus development in the womb and only observed when the child age reaches approximately two years old. Malnutrition at a younger age leads to an increase in infant and child mortality, causes them to be easily sick, and causes poor posture as adult (MCA Indonesia, 2015). According to the WHO Child Growth Stunting Standard, stunting is measured by the index of body length for age or height for age with a limit (z-score)  $< -2$  SD (WHO, 2010). Many factors cause stunting in children. Factors that cause stunting can be caused by direct or indirect factors. The direct factors of this incident are nutritional intake and the presence of infectious diseases while the indirect factors are parenting patterns, health services, food availability, cultural and economic factors (UNICEF, 1990).

### 2.2 Feeding Practices

The nutritional needs of infants and children can be obtained through exclusive breastfeeding and complementary foods that are appropriate for the age of the child in terms of quantity, frequency, and texture of the food. Several studies in Indonesia revealed that the main factors causing malnutrition and growth retardation in children under five were related to low breastfeeding and poor practice of complementary feeding (Adriani & Kartika, 2013). At the time of preparing and serving food, hygiene also needs to be considered such as avoiding food from dust and animals, cleanliness of eating and cooking utensils, mothers or family members who provide food must wash their hands with soap because unclean and contaminated food can cause diarrhea or illness, and other infections in children (Istiany & Rusilanti, 2013).

Poor parenting causes the poor nutritional status of children under five. If this happens during the golden age, it will cause the brain to not develop

optimally and it will be difficult to recover. The results of a study conducted by Sari & Ratnawati showed a relationship between feeding practices to toddlers and nutritional status. Feeding practices were correlated with the quality of food consumption which in turn will increase nutritional adequacy. The level of nutritional adequacy is one of the factors that can affect the nutritional status of toddlers (Sari & Ratnawati, 2018).

Research conducted by Diana (2006) showed that mothers who worked as sharecroppers, had daily activities always take their toddlers to the fields or fields because there was no other alternative caregiver so that the time between mother and child was reduced. The results of observations showed that children usually do things or play alone without knowing whether what they are doing was good or not, while parents only supervise occasionally, including the lack of time to provide or accompany children while eating while telling stories or creating fun and comfortable eating situations for children. Thus, affecting the eating patterns of mothers of toddlers. However, the results of this study were inversely proportional to Martianto *et al* (2011) which showed that there was no significant relationship between nutritional status and parenting. This was because of the differences in the ages of the children under five studied, which was 24-60 months, non-working mom or were housewives, most of whom were classified as capable or not poor, and the category of the research area was not food insecure.

Failure in feeding practices can lead to feeding problems in toddlers and child development in later periods. The consequences of poor or poor nutrition in infancy are impaired growth and development of the brain, muscles, body composition, and metabolic programming of glucose, fat, and protein. Long-term impacts can be in the form of low reasoning ability, educational achievement, immunity, and work productivity (Naser & Alawar, 2016).

## 3 METHODS

This study is quantitative research with systematic review approach. This study was conducted on June 2021. There are five steps in this methods which are determining topic, searching sources, choosing the most relevant sources, organizing and analyzing, and summarizing. Keywords were feeding practices, stunting, and Indonesia. This literature review focuses on information about relationship between feeding practices and stunting in Indonesia. Articles were searched from the following databases: Google

Scholar and Pubmed. These databases were chosen because most Indonesian research in Bahasa Indonesia published in those databases. The inclusion criteria were Indonesian studies, study design used correlation and quasi-experimental, and published between 2017-2021 full text. The articles selection process is described in figure 1.

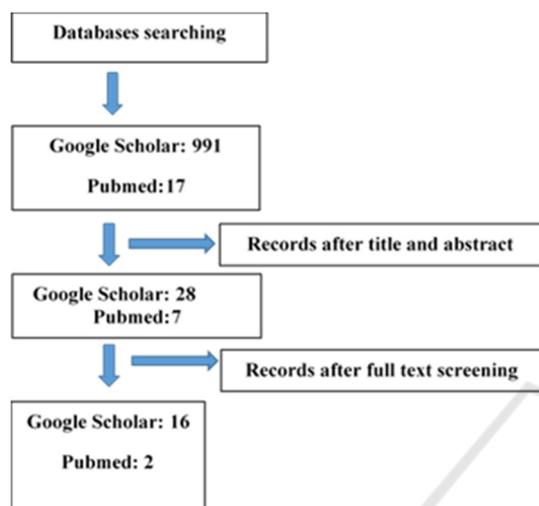


Figure 1: Article selection process

## 4 RESULTS AND DISCUSSION

The majority of studies only assess a single factor and did not provide a comprehensive view of association between feeding practices and stunting. Some of the literature that has been reviewed has differences, this is because each article uses a measurement theory that has differences and this causes each article to have to adjust the characteristics of the respondents used. In addition, the difference can be seen from the age limit of the child. The research design that is generally used to discuss child feeding practices in Indonesia is cross-sectional.

The majority of the studies revealed no significance relationship between maternal feeding practices and incidence of stunting. A cohort and randomized controlled trial study demonstrated no significant relationship of infant and young feeding (IYCF) with improvement in growth of children under 2 years (Fahmida et al., 2020). Previous studies also indicated no significant relationship between feeding practices and incidence of stunting (Rahmawati & Nurhaeni, 2019). In terms of feeding practices, previous study showed that mothers did less responsive feeding practices, such as less

attention to the signs of child hunger, provided food that is not in accordance with the expected appetite for children, and either encouraged their children to eat a great deal or limited their eating (Novitasari & Wanda, 2020). However, another study show correlation between nutritional practices and nutritional status of toddlers in farmer families. It was emphasized on the study to use local food as strategy of improving the nutrition for family provided that it is easily obtained with the more affordable price (Simanjuntak et al, 2019).

The majority of studies related to child feeding practices in Indonesia use 8 WHO child feeding practice indicators such as sustained breastfeeding, the food introduction, minimum dietary diversity, minimum meal frequency (MMF), and minimum acceptable diet (MAD). Continued breastfeeding is the proportion of mothers who provide continuous breastfeeding until the children reach the age of 2 years old. The introduction of foods is measured based on the proportion of infants who begin to introduce and have given food at the age of 6-9 months. WHO/UNICEF in its provisions suggest that infants and children aged 6-23 months receive sufficient complementary foods provided that they can receive at least 4 or more than 7 food groups. The 7 food groups consist of dairy products, eggs, cereals/tubers, nuts, other protein sources, vegetables, and fruits rich in vitamin A, also other vegetables and fruits.

Children must meet the Minimum Meal Frequency (MMF) requirements, namely infants 6-23 months who are given or not breastfed and have received *complementary feeding* (soft food/solid food, including breastfeeding for those who are not breastfed) must be given with a frequency according to age and needs. Meanwhile, based on the practice of feeding infants and children (PMBA) children aged 6-9 months must eat at least 2 times/day, children aged 9-12 months at least 2 times/day, while children aged 12-24 months must eat at least 3 times/day. Meanwhile, the Minimum Acceptable Diet (MAD) is a blend of minimum dietary diversity (MDD) and minimum meal frequency (MMF), namely babies who consume at least 4 of 7 types of food with a minimum eating frequency according to their age. So if the MDD and MMF are met, then the MAD is also fulfilled. Indicators of iron consumption are also considered by calculating the percentage of children consuming iron foods at the age of 6 – 23 months in the form of local and fortified foods. In other studies, there are also indicators of other feeding practices such as accuracy of infant age at feeding, frequency of feeding, amount of food consumed, texture or

Table 1: The summary of articles about relationship between feeding practice and stunting in Indonesia

Data Sources	Authors	Subject	Design	Place	Findings
Google Scholar	Rusmil VK et al	Children aged 12-23 months old	Cross sectional	Jatinangor Primary Healthcare	There was a relationship between caregiver's behavior in child feeding practice and stunting
Google Scholar	Niga MD, Purnomo W	Children aged 1-2 years old	Case control	Oebobo Kupang Primary Healthcare	There is an association between feeding practice and hygiene practices with stunting incident whereas health care practices have no significant relationships with stunting
Google Scholar	Imelda et al.	Children aged 2-5 years old	Case control with comparison 1:2	Birimaru Primary Healthcare	Complete basic immunization, feeding practice, low birth weight, and iodize salt were risk factors of stunting
Google Scholar	Susanti E	129 under five years old children	Cross sectional	Gunung Maddah Sampang Village	There were strong correlation between infant feeding practices and also parent attachment impact with nutritional status of under five years old children
Google Scholar	Febrianita Y, Fitri A	66 mothers	Descriptive research	Tapung Kabupaten Kampar.	49,5 % of mothers are classified as adequate category in feeding practices to toddlers and is associated with stunting
Google Scholar	Lobo et al	137 stunting toddler	Case control	Alak Health Center of Kupang City	Mother's education, parental income, mother's knowledge on nutrition, large family, feeding practice, hygiene and environmental sanitation practices, energy adequacy rate and protein adequacy rate have correlation with stunting.
Google Scholar	Hidayat et al	Mothers who had stunting children	Retrospective method	Sukamukti Community Health Centre	This study revealed that 32% of the children did not get early initiation of breastfeeding, 84% did not receive exclusive breastfeeding, 46% did not complete breastfeeding until the age of two years, 34% did not achieve the minimum dietary diversity (MDD), 36% did not achieve the minimum meal frequency (MMF), 56% did not achieve the minimum acceptable diet (MAD), and all of respondents consumed iron-containing foods.
Google Scholar	Khaerunnisa et al	Mothers who had stunting toddler	Cross sectional	East Cimahi Community Health Center	More than half of the respondents started to introduce family food when the child was 12 months old. The continuous provision of complementary feeding, the mother's attitude in the practice of feeding children was considered good (73.0%) and 80 % of the respondents adapted their children to family food.
Google Scholar	Tengkawan J et al	Parents with children aged 6-12 months	Quasi-experimental community-based study	Three stunting villages of Central Lombok, West Nusa Tenggara.	Seminar intervention was found to be able to improve the practice, while complete intervention (seminar and workshop) could enhance both practices and attitudes significantly.
Google Scholar	Tanuwijaya et al	Infants	Cross sectional	Pagelaran Village, Pagelaran District, Pandeglang	There was no significant relationship between maternal IYCF knowledge and nutritional status.

Google Scholar	Purnama NLA	Toddlers	Cross-sectional	Posyandu Anggrek 2, Mulyorejo Sub-District, Surabaya	Results show there is a relationship between exclusive breastfeeding and parental feeding behavior with stunting in children aged 1-3 years
Google Scholar	Siregar SG	Under Five Years Old Children	Cross-sectional	Posyandu of Sekip Village, Lubuk Pakam Subdistrict, Deli Serdang Regency	There was a relationship between maternal characteristics of education, income, knowledge, and parenting factors about the feeding practice and health practices with the incidence of malnutrition in under five years old
Google Scholar	Hendrawati et al	0-24 months old children	Retrospective Method	Sumedang	6,2 % of children did not receive complementary breastfeeding when the children aged 6-8 months, 32,9% of children did not meet the minimum dietary diversity, 37,0% of children did not achieve the minimum meal frequency, 55,5% of children did not achieve the minimum acceptable diet, and 100% of children consumed foods containing iron
Google Scholar	Sirajuddin et al	0-59 months children	<i>Cross Sectional</i>	Makassar	The significant determinants associated with stunting were exclusive breastfeeding, complementary feeding practices, and frequency of feeding. Exclusive breastfeeding is the major determinant for stunting in toddlers and therefore should be a priority program to improve the nutritional status of children in early ages of life.
Google Scholar	Starkweather C et al	Under age 2 years old children	Cross sectional	Rural Indonesia	Participation in intervention providing interpersonal communication was associated with increase knowledge of feeding practices. On the other side, knowledge of feeding practices was correlated to achieving recommended behavioral practices of minimum meal frequency, dietary diversity, adequate diet.
Google Scholar	Fahmida et al	Under 2 years old	Cluster randomized cohort trial	Sidoarjo and Malang District	The intervention was effective in improving the feeding practices of children although it was failed to show significant improvement in linear growth of children at 18 months of age.
Pubmed	Novitasari et al	Children under 5 years old	<i>Cross sectional</i>	Depok	There was no relationship between maternal feeding practice and the incidence of stunting in children in Depok. Moreover, most of mothers did non-responsive feeding practice.
Pubmed	Febriana WR, Nurhaeni N	Children aged 6-23 months old	<i>Cross Sectional</i>	East Jakarta	There was no significant association between IYCF practices and stunting and its relation with mother and child characteristics like mother's age, mother's employment status, mother's educational level, low birth weight, sanitation and health behaviors, and household income.

consistency of spent food, food diversity, feeding methods, personal hygiene (Nurbaiti et al, 2019). This literature review provides comprehensive information about the relationship between feeding practices and stunting. However, it only looks at Indonesian studies. These findings may not apply to children from other countries that have the different characteristics to Indonesia.

## 5 CONCLUSION

Most studies on child feeding practices in Indonesia use the WHO IYCF indicators. Some studies add socio-demographic characteristics and aspects of personal hygiene. Further research by adding aspects of feeding rules is needed. Aspects of feeding rules include schedule, environment, and feeding procedures. According to the WHO's UNICEF framework, feeding practices are an immediate factor in nutritional problems. So that good feeding practices need to be considered by caregivers, especially parents. Parents need to pay attention to proper feeding rules such as not being distracted while eating, creating a pleasant atmosphere, and encouraging children to eat alone. This is to minimize the problem of difficult eating which will have an impact on the problem of malnutrition.

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