

Systematic Review: Protective Factors from the Risks of Stunting in Breastfeeding Period

Riris Diana Rachmayanti¹, Zulfa Kevaladandra², Faisal Ibnu³, Nur Khamidah⁴

¹Division of Health Promotion and Behavioral Sciences, Faculty of Public Health, Universitas Airlangga

²Master of Public Health, Faculty of Public Health, Universitas Indonesia

³Institute of Health Science Bina Sehat PPNI Mojokerto

⁴Department of Public Health Science, Faculty of Medicine, Universitas Wijaya Kusuma Surabaya

ABSTRACT

Background: Stunting is a chronic nutrition condition marked by improper growth of body height compared to one's age. One of the factors that affect stunting is exclusive breastfeeding as breast milk contains macronutrients, micronutrients, and bioactive substances to support the growth and development of children under five and act as an anti-infection. Non-optimal breastfeeding causes children to have inadequate nutrition intake and body immunity, which may result in malnutrition and stunting. This study aims to identify the effects of exclusive breastfeeding on the incidence of stunting in children under five.

Method: A systematic review was conducted using eight indexed articles with keywords of "Stunting", "ASI Eksklusif" (t/n: Exclusive Breastfeeding), "Gizi Ibu dan Anak (t/n: Nutrition of Mothers and Children)", "Stunting pada Balita (t/n: Stunting in Children Under 5)", "Exclusive Breastfeeding", "Nutritional Status and Exclusive Breastfeeding", and PICOT. Articles published within the last seven years (2014-2020) were selected. The articles should address health education to mothers with children aged < 5 years old without a control group, and should show a relation between exclusive breastfeeding and the incidence of stunting. Besides, they should be analytical and observational research written in English and Indonesian.

Results: Eight articles selected overall showed that exclusive breastfeeding was significantly related to the incidence of stunting in children under five. Exclusive breastfeeding is protection against stunting as breast milk contains nutrients that can increase body immunity, prevent infection, and nutritional substances for optimal growth and protection from the risks of chronic diseases. Exclusive breastfeeding is one of the significant factors that affects stunting in children under five.

Correspondence

riris.diana@fkm.unair.ac.id

Article History

Received 8 January 2022

Revised 20 January 2022

Accepted 12 May 2022

Available Online 31 May 2022

Keywords

Exclusive breastfeeding

Stunting

Children under 5

DOI

10.14710/jpki.17.2.72-78

INTRODUCTION

Early childhood is the foundation of one's future life. Failing to optimize early childhood growth and development will cause children to experience health problems, such as stunting. Stunting is an impact of chronic malnutrition on a baby inside the womb and on children in early childhood. It may hinder children's physical development, motoric and mental growth, and cognitive capacity; in addition, it may cause long-term problems, such as degenerative diseases.¹ Children with stunting may not reach normal body height and full cognitive potential if compared to their age. In adulthood, children who suffer from stunting may experience higher risks of interrupted education, overweight and obesity compared to children with normal body height.^{2,3}

Some characteristics of stunting are measured from body height above minus two of the median deviation standard of children's growth standard from the World Health Organization (WHO). The WHO announced a policy brief about decrease of stunting cases among children under five by the year of 2025 at 40%.⁴ According to UNICEF in 2018, three out of 10 children under five suffered from stunting, and one out of 10 suffered from wasting. The prevalence of stunting incidence among children under five was at 37.2% nationally in 2013. Meanwhile, it decreased by 3.1% to 27.67% in 2018. The 2019 Indonesia's Health Profile noted that the proportion of stunting (height/age) in children under five was 27.67% in Indonesia where East Nusa Tenggara, West Sulawesi, and West Nusa Tenggara

dominate the stunting incidence. Meanwhile, Riau Islands, Bangka Belitung Islands, and Jakarta have the lowest proportion of stunting in children under five.⁵

Until today, stunting remains to be one of the main child nutrition problems in Indonesia. Stunting happens when infant has not received enough nutrients since birth. Several contributing factors to stunting include lack of early initiation of breastfeeding, failure in exclusive breastfeeding, early weaning, and improper portion of food quantity, quality, and safety for complementary feeding.^{6,7} Besides early initiation of breastfeeding and complementary feeding, other contributing factors to stunting incidence include inadequate nutrition of mothers, poor parenting and knowledge of parents, Low Birth Weight (LBW), incomplete immunizations, limited antenatal and postnatal care services, poor house sanitation, and limited access to drinking water, inadequate access to nutritional foods, as well as family income.⁸ Research conducted by Damayanti and Susilowati (2021) adds more stunting factors such as infectious diseases, insufficient protein intake, shorter birth body length, and inadequate knowledge of mothers about nutrients.⁹

Exclusive breastfeeding is considered able to prevent stunting because it accounts for future sustainable life. Early initiation of exclusive breastfeeding is relatively easy to perform, and it will impact children's growth and development.¹⁰ The WHO also recommends exclusive breastfeeding to children aged up to 6 months, proceeded with initiation of complementary foods according to children's age. Babies breastfed for six months should continuously receive breastfeeding until the age of 2. Breast milk is ideal safe and clean food for infants and children under five as it contains antibodies which can prevent various diseases in children.

According to the Indonesian Government's Rule Number 33 Year 2012, exclusive breastfeeding is the provision of breast milk from birth to the age of six months without additional or substituted foods or drinks.¹¹

Breast milk contains macronutrients (protein, carbohydrate, fats, carnitine), micronutrients (vitamins and minerals), as well as bioactive substances needed by infants and children under five. Some research shows benefits of breastfeeding such as providing ideal nutrition and antibodies, increasing child's intelligence, strengthening maternal bond between mothers and children, supporting the growth of ideal body weight, preventing sudden infant death syndrome (SIDS), reducing risks of diabetes and obesity, and many more. In contrast, low coverage of breastfeeding may ruin the quality of future life as well as the nation's economy.¹² Considering multidimensional stunting issues, this current systematic review aimed to identify the impacts of exclusive breastfeeding on stunting incidence in children under five.

METHOD

This study was a systematic review which synthesizes the previous research articles through systematic search and critical approach based on specific issues. A systematic review comprehensively identifies and tracks a certain topic, according to certain criteria which are also known as an overview^{13,14}.

Table 1 shows that research articles were searched in three databases, namely ProQuest, Elsevier, and Google Scholar within seven-year publication (2016-2021) and were written in Indonesian and English. Keywords used in article search were adjusted to the Medical Subject Heading (MeSH) including "Stunting", "*ASI Eksklusif* (t/n: Exclusive Breastfeeding)", "*Gizi Ibu dan Anak* (t/n: Nutrition of Mothers and Children)", "*Stunting pada Balita* (t/n: Stunting in Children Under 5)", "Exclusive Breastfeeding", "Nutritional Status and Exclusive Breastfeeding" according to PICOTs (Population, Intervention, Comparators, Outcome, Time). The guides to assess the quality of the study were the Joanna Briggs (JBI) Critical Appraisal and PRISMA (Preferred Reporting Item for Systematic Reviews and Meta-Taken) statement guidelines (see figure 1).

Table 1. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Population	Mothers with children aged < 5	Mothers with children aged > 5
Intervention	Health education	Food, media
Comparators	Without control group	With Control group
Outcomes	Research showed a relation between exclusive breastfeeding and the incidence of stunting	Research showed no relation between exclusive breastfeeding and the incidence of stunting
Time	Within the past seven years	More than the past seven years
Study design	Analytical observational research	Experimental research
Language	Indonesian, English	Besides Indonesian and English

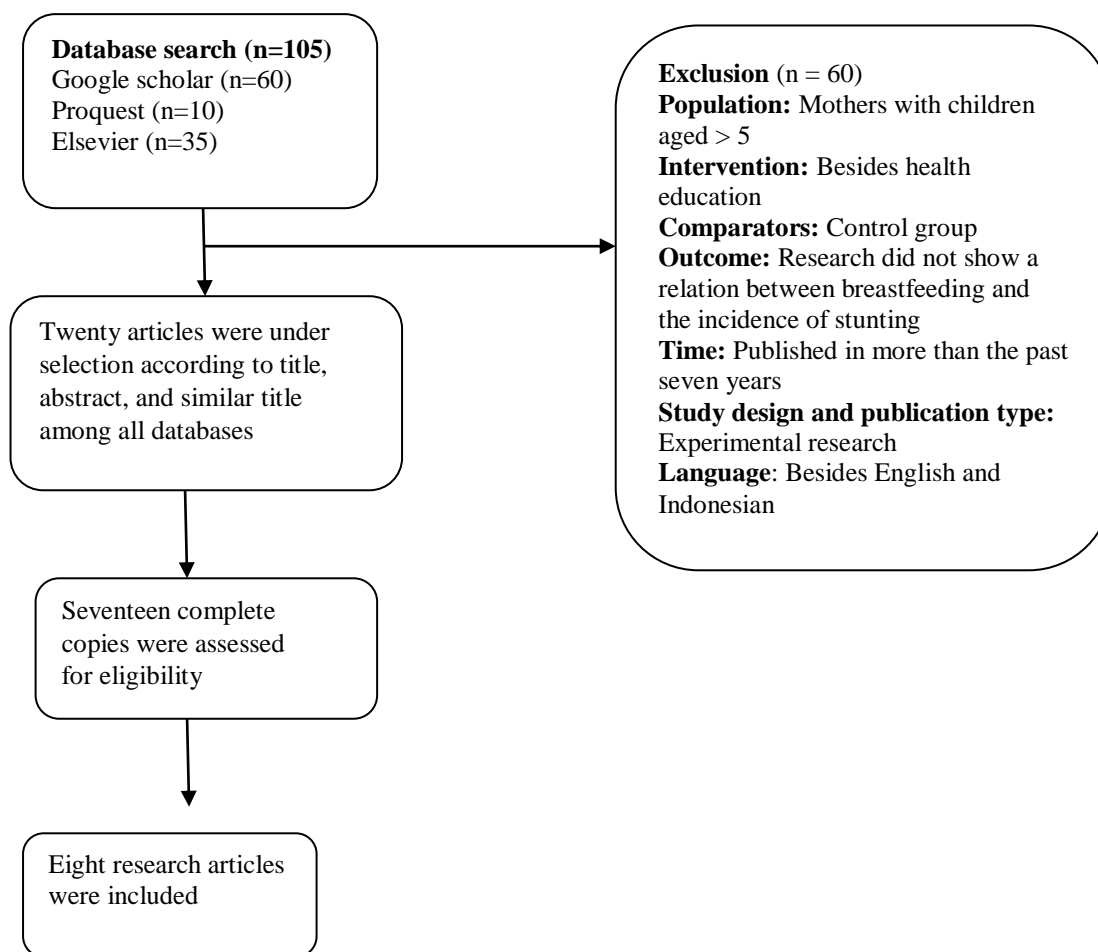


Figure 1. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart

RESULTS AND DISCUSSION

Eight research articles were included in this study. Table 2 reported the recapitulation of each article in

a systematic review of protective factors from the risks of stunting in breastfeeding period.

Table 2. List of research articles

No	Author	Year	Vol, No	Title	Methods (Design, Sample, Instrument, Analysis)	Research Results	Database
1	Sr. Anita Sampe SJMJ, Rindani Claurita Toban, Monica Anung Madi	2020	Volume 11, No. 1	Relation between Exclusive Breastfeeding and the Incidence of Stunting in Children Under 5	Design: Case-control Sample: 144 respondents, using cluster random sampling Instrument: Questionnaire Analysis: Univariate dan bivariate	Results showed that a history of exclusive breastfeeding was significantly related to the incidence of stunting (p < 0.05, OR = 61).	Google Scholar
2	Louisa A. Langi, Regina Agape C. Toding	2020	Volume 7, No. 1	Relation between Exclusive Breastfeeding and the Incidence of	Design: Cross-sectional Sample: 47 respondents, using simple random sampling Instrument: Questionnaire	Results showed a significant, sufficient, and parallel relationship between the	Google Scholar

				Stunting in Children Aged 2-5 in the New Public Health Center, Balikpapan, Period July-August 2019	Analysis: Univariate dan bivariate	coverage of breastfeeding in children aged 2 and the incidence of stunting ($p < 0.05$, Correlation coefficient = 0.340).	
3	Sri Indrawati	2016	Volume 1, No. 1	Relation between Exclusive Breastfeeding and the Incidence of Stunting in Children Aged 2-3 in the Karangrejek Wonosari Gunungkidul Village	Design: Cross-sectional Sample: 130 respondents, using simple random sampling Instrument: Questionnaire Analysis: Univariate dan bivariate	Results showed a relation between exclusive breastfeeding and stunting in children aged 2-3 ($p < 0.05$).	Google Scholar
4	Bustami Bustami, Miko Ampera	2020	Volume 8 (E)	Identification of Modelling Causes of Stunting Children Aged 2-5 Years in Aceh Province, Indonesia (Data Analysis of Nutritional Status Monitoring 2015)	Design: Cross-sectional Sample: Cluster sampling Instrument: Documentation guide Analysis: Univariate, bivariate, and multivariate	Results showed that exclusive breastfeeding significantly affected the incidence of stunting in children ($p < 0.05$, OR = 12.6, CI 95%: 9.853-16.491)	Elsevier
5	Devillya Puspita Dewi	2015	Volume 10, No. 4	Status of Stunting and Its Relation to Exclusive Breastfeeding in Children Under 5 in Gunung Kidul District	Design: Case-control Sample: 186 respondents, using simple random sampling Instrument: Questionnaire Analysis: Bivariate (Chi-square)	Results showed an association between exclusive breastfeeding and the incidence of stunting ($p < 0.05$)	Proquest
6	Teshale Fikadu, Sahilu Assegid, Lamessa Dube	2014	Volume 14, No. 800	Factors Associated with Stunting among Children Aged 24 to 59 months in Meskan district, Gurage Zone, South Ethiopia: a-Case-Control Study	Design: Case-control Sample: 242 respondents, using simple random sampling Instrument: Written Test Analysis: Bivariate dan multivariate	Results showed that children breastfed for <2 years and children breastfed for <6 months obtained AOR of 5.61 with 95%CI: 1.49-11.08 and AOR of 3.27 with 95% CI of 1.21-8.821.	Elsevier
7	Endang Dewi	2018	Volume	Correlation	Design: Case-control	Results showed	Proquest

	Lestari, Faraissa Hasanah, Novianto Adi Nugroho	58, No. 3		between Non-Exclusive Breastfeeding and Low Birth Weight to Stunting in Children	Sample: 60 respondents, using simple random sampling Instrument: Questionnaire Analysis: Bivariate dan multivariate	that exclusive breastfeeding had a significant correlation with the incidence of stunting ($p < 0.05$, OR = 0.201)	
8	Apri Sulistianingsih, Rita Sari	2018	Volume 15, No. 2	Exclusive Breastfeeding and Birth Weight Affected Stunting in Children Aged 2-5 in Pesawaran District	Design: Cross-sectional Sample: 385 respondents, using proportional cluster sampling Instrument: Questionnaire Analysis: Chi-Square	Results showed that a history of exclusive breastfeeding was significantly related to the incidence of stunting (OR = 0.122; CI = 0.075-0.199)	Google scholar

According to Sampe, et al. (2020), children under five who were not breastfed exclusively had 61 times chances to experience stunting.³ Langi, et al. (2020) support them by showing a significant, sufficient, and parallel relationship between the coverage of breastfeeding in children aged up to two years and the incidence of stunting.¹⁵ Similar research conducted by Indrawati, et al. in 2016 finds a relation between exclusive breastfeeding and the incidence of stunting in children aged 2-3 years. They show that the majority of the children breastfed (86.9%) did not suffer from stunting.¹⁶ Bustami (2020) mentions that exclusive breastfeeding highly affected the incidence of stunting. His research indicates that children who were breastfed exclusively for six months had a 12.6 times lower risk to suffer from stunting than non-breastfed children.¹⁷

Similar research conducted by Dewi in 2015 about stunting was closely related to the incidence of stunting in children under five ($p < 0.05$).¹⁸ Other research conducted by Fikadu, et al. (2014) shows that children who were breastfed exclusively for less than two years and children who were breastfed exclusively for less than six months had the risk of 5.6 times and 3.27 times higher, respectively to experience stunting than children who were breastfed for more than two years and six months.¹⁹ Endang, et al. (2018) discover a significant relation between non-exclusive breastfeeding and stunting, meaning that exclusive breastfeeding is the protective factor from stunting.²⁰ Meanwhile, research by Apri and Sari (2018) states that a history of exclusive breastfeeding was significantly related to the incidence of stunting. Their research shows that children under five who were

breastfed had a 9.3 times lower risk to suffer from stunting than non-breastfed children.²¹

The effects of stunting vary across aspects, such as reduced child learning achievement, weak mental, motoric, and intellectual development.²² Research conducted in Buntu Malangka Subdistrict, Mamasa District, mentions that 66 non-breastfed children under five suffered from stunting. The same research shows non-breastfed children under five had a 61 times probability or 98% to suffer from stunting.³ Parallel to this previous study, research in Aceh points out that children aged 2-5 years with 16.7 times chances of stunting were those who never received breastfeeding along with no support of , complementary foods and vitamin A, age of weaning, and unemployment.¹⁷ Research on the 2015 National Nutrition Survey data of Jambi Province mention that 27.5% of children aged 6-59 months suffered from stunting. It shows children who did not receive early initiation of breastfeeding had 1.3 times probability to experience stunting. It indicates that excusive breastfeeding is a part of maternal health care and provision of nutrition that might reduce the risk of stunting in children under five.¹⁰

The main cause of death in children under five in Ethiopia was related to breastfeeding, culture, and unhygienic family condition. The risk of infant death increases as infants receive breastmilk late after birth. Children who were not breastfed exclusively had a high risk of getting a disease.²³ Not only is stunting caused by non-exclusive breastfeeding, but also early initiation of complimentary food as well as formula milk; as a result, the children are likely prone to getting infectious diseases such as diarrhea and respiratory diseases.²⁴ Previous research in Mexico also figures out the reasons on low

coverage of breastfeeding among children. These include inability to produce a sufficient amount of breastmilk, poor mothers' knowledge about baby feeding, and mother employment status such as students, working mothers, and so on. Statistically, the number of non-breastfed children with short height is larger than that of breastfed ones.²⁵

Various research conducted in Indonesia and outside similarly shows a strong relation between exclusive breastfeeding and the incidence of stunting as shown in Baggai and Surabaya.^{28,29} For instance, research in Pakistan and Brazil confirms a relation between the duration of breastfeeding and stunting.^{26,27} Besides exclusive breastfeeding, stunting is also related to infections experienced by infants and children under five, for example diarrhea.³⁰ A social economy factor, on the other hand, becomes another contributing factor to stunting. Therefore, low-to-middle income groups should receive nutrition aids to support their child growth and development.³¹

Some other factors affecting the incidence of stunting include ANC visits and immunizations,³ LBW,^{16,20,21} mother's occupation,¹⁹ family income, and economic status,^{16,17} provision of vitamin A, age of weaning,¹⁷ poor mother's awareness of the importance of breastmilk.^{15,18} Malnourished mothers likely possess a high risk of conceiving infants with LBW.²⁴ It is important to provide education to prospective mothers before their pregnancy, monitor mothers' postnatal condition, especially exclusive breastfeeding practice, and give them other support including social and economic support.

CONCLUSION

Exclusive breastfeeding may reduce the risk of stunting as infants and children under five highly need nutrition in breastmilk. Factors that affect exclusive breastfeeding include knowledge of mothers and families about exclusive breastfeeding, early initiation of breastfeeding, complementary feeding, and non-health factors. Therefore, of the health workers have to invite the district health office, health cadres, and health promoters to support the exclusive breastfeeding program. Moreover, they have to educate and provide accurate information on stunting and its prevention, as well as to prepare women's knowledge and nutrition status before they plan for pregnancy.

REFERENCES

1. UNICEF. Nutrition: Tackling the "double burden" of malnutrition in Indonesia. 2018.
2. UNICEF. Child Nutrition. 2019. Available online at <https://data.unicef.org/topic/nutrition/child-nutrition/>
3. SJMJ SAS, Toban RC, Madi MA. Hubungan Pemberian ASI Eksklusif Dengan Kejadian Stunting Pada Balita. *J Ilm Kesehat Sandi Husada*. 2020;11(1):448–55.
4. WHO. Global nutrition targets 2025: stunting policy brief (WHO/NMH/NHD/14.3). WHO. Geneva; 2014.
5. Kementerian Kesehatan RI. Profil Kesehatan Indonesia Tahun 2019. Jakarta: Kementerian Kesehatan RI; 2019.
6. Kemenkes RI. Buletin Stunting. *Kementeri Kesehat RI*. 2018;301(5):1163–78.
7. Tim Nasional Perencanaan Penanggulangan Kemiskinan. 100 Kabupaten/Kota Prioritas untuk Intervensi Anak Kerdil (Stunting). 2017:148–62.
8. Cynthia C, Bikin Suryawan IW, Widiasta AAM. Hubungan ASI eksklusif dengan Kejadian Stunting pada Anak Usia 12-59 bulan di RSUD Wangaya Kota Denpasar. *J Kedokt Meditek*. 2019 Sep;25(1 SE-Artikel Penelitian):29–35.
9. Damayanti S, Susilowati E. Literature Review : Mengkaji Faktor-Faktor Yang Literature Review : Assessing Factors Related To Stunting. 2021;7.
10. Muldiasman M, Kusharisupeni K, Laksmningsih E, Besral B. Can early initiation of breastfeeding prevent stunting in 6–59 months old children? *J Heal Res*. 2018;32(5):334–41.
11. Kementerian Sekretariat RI. Peraturan Pemerintah Republik Indonesia Nomor 33 Tahun 2012 Tentang Pemberian ASI Eksklusif. Indonesia; 2012.
12. Wijaya FA. ASI Eksklusif : Nutrisi Ideal untuk Bayi 0-6 Bulan. *Contin Med Educ*. 2019;46(4):296–300.
13. Ganeshkumar P, Gopalakrishnan S. Systematic reviews and meta-analysis: Understanding the best evidence in primary healthcare. *J Fam Med Prim Care*. 2013;2(1):9.
14. Clarke J. What is a systematic review. *Evid Based Nurs*. 2011;14(3):64.
15. Louisa A. Langi RACT. Hubungan Pemberian Asi Terhadap Kejadian Stunting Pada Balita Usia 2-5 Tahun Di Puskesmas Manggar Baru, Balikpapan Periode Juli-Agustus 2019. *Pro-Life*. 2020;7.
16. Indrawati S. Kejadian Stunting Pada Anak Usia 2-3 Tahun di Desa Karangrejek Wonosari Gunung Kidul. 2016;
17. Bustami B, Ampera M. The identification of modeling causes of stunting children aged 2–5 years in Aceh province, Indonesia (Data analysis of nutritional status monitoring 2015). *Open Access Maced J Med Sci*. 2020;8(E):657–63.
18. Dewi DP. Status Stunting Kaitannya Dengan Pemberian Asi Eksklusif pada Balita di Kabupaten

- Gunung Kidul. *J Med Respatiespati*. 2015;10(4):60–6.
19. Fikadu T, Assegid S, Dube L. Factors associated with stunting among children of age 24 to 59 months in Meskan district, Factors associated with stunting among children of age 24 to 59 months in Meskan district, Gurage Zone, South Ethiopia: a case-control of age 24 to 59 months in Mes. *BMC Public Health*. 2014;14:1–7.
 20. Lestari ED, Hasanah F, Nugroho NA. Correlation between non-exclusive breastfeeding and low birth weight to stunting in children. *Paediatr Indones*. 2018;58(3):123–7.
 21. Sulistianingsih A, Sari R. ASI eksklusif dan berat lahir berpengaruh terhadap stunting pada balita 2-5 tahun di Kabupaten Pesawaran. *J Gizi Klin Indones*. 2018;15(2):45.
 22. Glanny Anindya I, Salimo H, Lanti Y, Dewi R. The Association between Exclusive Breastfeeding, Maternal Nutritional Status, Maternal Zinc Intake, and Stunting in Infants Aged 6 Months. *J Matern Child Heal*. 2020;5(1):35–48.
 23. Biks GA, Berhane Y, Worku A, Gete YK. Exclusive breastfeeding is the strongest predictor of infant survival in Northwest Ethiopia: A longitudinal study. *J Heal Popul Nutr*. 2015;34(1):7–12.
 24. Widaryanti R, Luthfiyati Y. Reduce the Stunting With the Infant and Young Child Feeding Practice (Iycf) in Yogyakarta, Indonesia. In: *Proceeding International Conference*. 2019. p. 531–6.
 25. Zaragoza-Cortes J, Trejo-Osti LE, Ocampo-Torres M, Maldonado-Vargas L, Ortiz-Gress AA. Poor breastfeeding, complementary feeding, and dietary diversity in children and their relationship with stunting in rural communities. *Nutr Hosp*. 2018;35(2):271–8.
 26. Syeda B, Agho K, Wilson L, Maheshwari GK, Raza MQ. Relationship between breastfeeding duration and undernutrition conditions among children aged 0–3 Years in Pakistan. *Int J Pediatr Adolesc Med [Internet]*. 2021;8(1):10–7. Available from: <https://doi.org/10.1016/j.ijpam.2020.01.006>
 27. Rocha HAL, Correia LL, Leite ÁJM, Rocha SGMO, Machado MMT, Campos JS, et al. Undernutrition and short duration of breastfeeding association with child development in Ceará, Semi-Arid Region of Brazil: a population-based study. *J Pediatr (Rio J)*. 2021;000(xxx):3–9.
 28. Maulina C, Rachmayanti RD. Risk Factors for Stunting under Two-Year-Old Children in Surabaya. *J Promosi Kesehat Indones*. 2021;16(1):1–6.
 29. Rocha HAL, Correia LL, Leite ÁJM, Rocha SGMO, Machado MMT, Campos JS, et al. Risk factors for stunting among children in Banggai Regency, Indonesia. *J Pediatr (Rio J) [Internet]*. 2021;8(1):149–52. Available from: <https://doi.org/10.1016/j.enfcli.2019.10.058>
 30. Arlinda S, Riviwanto M. Determinant Factors Of Stunting In West Pasaman District , West Sumatera Indonesia. 2022;14(1).
 31. Beal T, Tumilowicz A, Sutrisna A, Izwardy D, Neufeld LM. A review of child stunting determinants in Indonesia. 2018; Available from: <https://doi.org/10.1111/mcn.12617>