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Review Article

Exclusive Breastfeeding as a Risk Factor for Stunting Among Under-Fives in Urban and Rural Indonesia: A Systematic Review

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ABSTRACT

Background: Previous research found that children in rural areas have a 1.3 times greater risk of stunting than children in urban areas. Exclusive breastfeeding is one of the risk factors for stunting. The 2017 Indonesian Demographic and Health Survey (IDHS) showed that the percentage of exclusive breastfeeding in urban areas was 37.8%, while in rural areas, it was 46.9%. The purpose of this study was to determine the magnitude of the risk of stunting in toddlers who are not exclusively breastfed in rural and urban areas.

Method: This research used a Meta-Analysis Systematic Review by searching articles in PubMed, Google Scholar, and Garuda that were in Indonesian or English and published between 2019 and 2024. Keywords included stunting, risk factors, exclusive breastfeeding, children under five, rural, and urban. The article search used the PICO framework, while the article quality assessment used the Joanna Bright Institute (JBI) Critical Appraisal Instrument. The data collected was presented in a PRISMA diagram and analyzed based on Forest Plot graphs using RevMan 5.4.1.

Results: A total of 3,269 articles were identified, and 11 met the criteria. The analysis showed that toddlers not exclusively breastfed had a 3.84 times greater risk of stunting in rural areas and 2.38 times greater for urban regions than exclusively breastfed toddlers.

Conclusion: Children who are not exclusively breastfed in rural areas are at greater risk of stunting than those in urban areas.

Keywords: Stunting; Risk Factors; Exclusive Breastfeeding

INTRODUCTION

Toddlers have a double burden of nutritional problems, including obesity, stunting, anemia, thinness, and malnutrition.[1] Stunting is a chronic nutritional problem with a lower height or length than the established standard. A child is said to be stunted if the height or length according to age has a Z-score value <-2SD.[2] The prevalence of stunting in children under

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the age of five globally in 2022 is estimated to reach 22.3%. This means that around 148.1 million children worldwide are stunted.[3]

The 2023 Indonesian Health Survey (HIS) results found that 1 out of 5 toddlers in Indonesia, or 21.5%, experienced stunting.[4] This figure shows a decrease of 0.1% compared to the prevalence in 2022 at 21.6%. Despite the decrease, this progress has not been able to meet the target of the 2020-2024 National Medium-Term Development Plan (NMTDP), which targets the stunting of 14% in 2024.

Rural and urban areas show different patterns in stunting incidence. Globally, the prevalence of stunting in rural areas is almost twice as high as in urban areas. Based on data from the Food Agriculture Organization, the prevalence of stunting is 1.6 times higher in rural areas than in urban areas.[5] The 2018 Basic Health Research (BHS) results in Indonesia showed that the prevalence of stunting in rural areas reached 21.5%, while in urban areas, it was 17.4%.[6] The 2023 SKI report showed the same results, that the prevalence of stunting in rural areas was higher at 13.9% and in urban areas at 12.3%.[7]

Stunting resulted from a complex interaction between direct causal and contextual factors. The WHO conceptual framework on stunting in children illustrates that a country and its society play a role in stunting children in that country. External factors include culture, education, health services, economic conditions, politics, agricultural conditions and food systems, water conditions, sanitation, and the environment. Meanwhile, internal factors in the child's home also influential such as adequate childcare, exclusive breastfeeding (EB) and optimal complementary foods (CF), maternal conditions, home conditions, food quality, food and water safety, and infection factors.[8] This reflects that stunting is caused by household, environmental, socio-economic, and cultural factors.[9]

Exclusive breastfeeding is one of the risk factors for stunting. Exclusive breastfeeding is the best source of nutrients for infants, which can reduce the prevalence of child morbidity and mortality.[10] Despite the fact that breast milk is the best food for infants, not all infants receive exclusive breastfeeding.[11] Based on the Indonesian Nutritional Status Study (INSS) results, as many as 48.2% of infants in Indonesia received exclusive breastfeeding in 2021, which decreased to 14.6% in 2022. This shows that the coverage of exclusive breastfeeding in Indonesia is still low.[12]

Various studies in both rural and urban areas have shown that the inconsistency of exclusive breastfeeding can be a significant risk factor for stunting. Studies located in rural areas have shown that non-exclusive breastfeeding has an impact on the incidence of stunting.[13] Several studies located in urban areas have also shown a relationship between exclusive breastfeeding and the incidence of stunting.[14,15,16,17] In this case, it is interesting to know whether the risk of stunting in toddlers who do not receive exclusive breastfeeding in rural areas is the same as in urban areas. This information is essential to formulate a more effective strategy to reduce stunting rates in Indonesia. Based on this description, this study intended to determine the magnitude of the risk of stunting in toddlers who do not receive exclusive breastfeeding in rural and urban areas.

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METHOD

This research used a Meta-Analysis Systematic Review based on article search results in the electronic databases PubMed, Google Scholar, and Garuda. Articles were collected from August 2024 to September 2024. Keywords included stunting, risk factors, exclusive breastfeeding, children under five, rural, and urban, combined using Boolean Operators (AND, OR). The article searches flow used the PICO framework (*Population, Intervention*, *Comparison and Context*). Population explains the characteristics of the population to be observed, in this case, children under 5 years old (toddlers); Intervention explains the intervention or exposure being studied, namely toddlers who do not receive exclusive breastfeeding; Comparison informs the comparison group, namely toddlers who receive exclusive breastfeeding; and Outcome explains the results of previous studies that are consistent with the research topic, namely the incidence of stunting—article quality assessment using the Joanna Bright Institute (JBI) Critical Appraisal instrument. The collected data were presented in a PRISMA diagram following the identification, screening, eligibility, and inclusion selection stages. Data analysis based on the results of the Forest Plot graph using RevMan 5.4.1.

This study set the inclusion criteria of the article as follows: scientific articles published in 2019-2024; the study population was children under five years old (toddlers); the study examines risk factors for stunting; the location of the study was conducted in rural and urban areas in Indonesia according to the criteria of the Central Statistics Agency (CSA); the analytical observational study design includes Cohort, Case-Control, and Cross-Sectional; provides Odds Ratio (OR), Risk Ratio (RR), and Prevalence Ratio (PR); and the article was available in full text. The exclusion criteria applied were articles that were not primary research and articles in languages other than Indonesian and English. This study examines the findings of previously existing research using a Meta-analysis design of secondary data that has been published and does not involve human subjects directly, so it does not require Ethical Approval.

RESULTS

Figure 1 shows the research process; in the initial search process on various databases, article results were sourced from Google Scholar (2,855 articles), PubMed (167 articles), and Garuda (247 articles), so a total of 3,269 articles were obtained. After removing duplicate articles, the results were 2,264 articles. From this number, a systematic analysis was then carried out so that the final number of articles that met the criteria was 11, as presented in Table 1. Among the 11 selected articles, there are 6 research articles in rural areas and 5 research articles in urban areas. Furthermore, the Forest Plot analysis results are presented in Figure 2.

Forest Plot on Figure 2 shows that in rural areas, toddlers who do not receive exclusive breastfeeding are at 3.84 times greater risk of experiencing stunting compared to toddlers who receive exclusive breastfeeding (OR=3.84; 95% CI=2.47–5.97; p<0.00001). For urban areas, toddlers who do not receive exclusive breastfeeding are at 2.38 times greater risk of experiencing stunting compared to toddlers who receive exclusive breastfeeding (OR=2.38; 95% CI=1.03–5.51; p=0.04). The significance value also shows that exclusive breastfeeding

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is associated with the risk of stunting in toddlers both in rural (p<0.00001) and urban (p<0.04) areas.

RESULTS

The results of the article search are presented according to the following systematic flow:

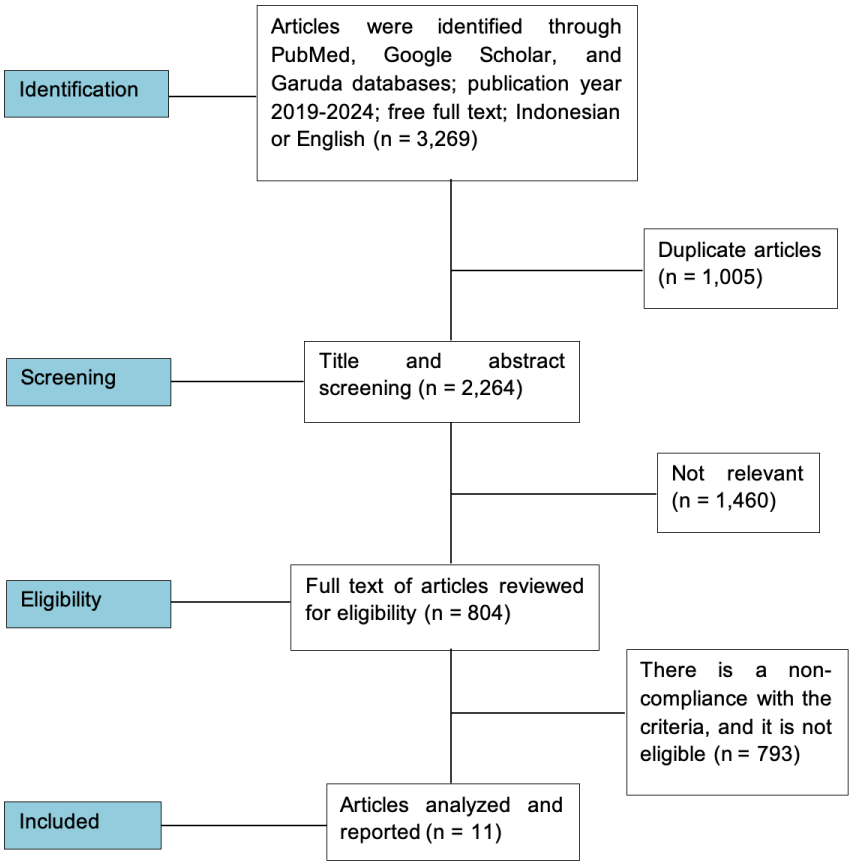

Figure 1. The flowchart of the paper selected in this study

Table 1. List of Articles with Exclusive Breastfeeding Variables to be Analyzed

No	Author (Year)	Research Design	Setting Area	*p*-value	OR (CI)
1.	Safitri, et al (2023)	Case Control	Rural	0.03	2.09 (0.98-4.61)
2.	Agussalim, et al (2024)	Case Control	Rural	0.03	2.44 (1.24-4.29)
3.	Fithria, et al (2024)	Case-Control	Rural	0.00	4.56 (2.25-9.23)
4.	Wicaksono, et. al (2021)	Case-Control	Rural	<0.01	3.64 (2.01-6.61)
5.	Wahyuni, et al (2019)	Case Control	Rural	0.00	5.67 (1.97- 15.51)

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No	Author (Year)	Research Design	Setting Area	*p*-value	OR (CI)
6.	Modjo, et al (2023)	Case-Control	Rural	0.00	14.06 (4.27-46.23)
7.	Widayati, et al (2021)	Case Control	Urban	0.36	1.56 (0.71-3.39)
8.	Al-Ayubi, et al (2021)	Case Control	Urban	0.62	1.33 (0.59 – 3.01)
9.	Yuniarti, et al (2019)	Case Control	Urban	0.00	19.5 (5.56 - 68.36)
10.	Maulana, et al (2023)	Case Control	Urban	0.02	3.47 (1.17-10.32)
11.	Wahyuningrum, et al (2023)	Case Control	Urban	0.50	1.02 (0.63- 1.65)

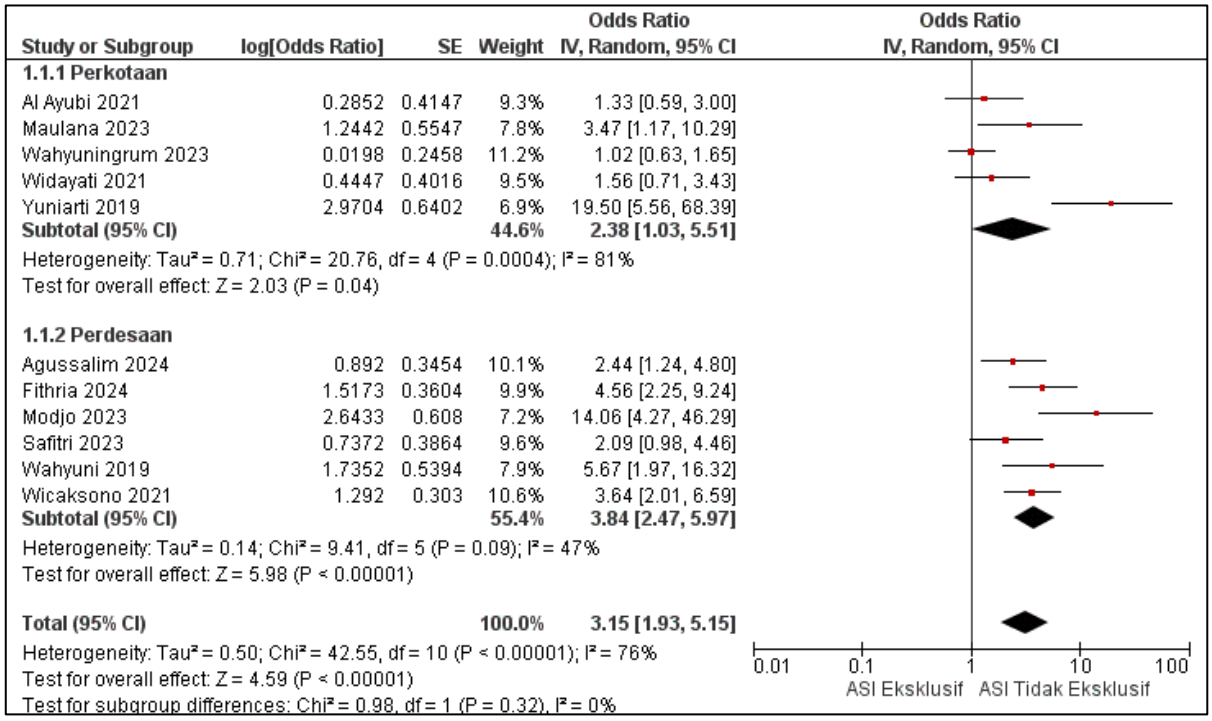

Figure 2. Forest Plot of the Relationship between Exclusive Breastfeeding and Stunting in Rural and Urban Areas

DISCUSSION

This study is a systematic review and combines quantitative estimation results (Meta-analysis) from several previous studies that answer the same research problem and can be combined. The study was conducted on exclusive breastfeeding as a risk factor for stunting in toddlers in rural and urban areas in Indonesia. The results of the study showed that toddlers who did not receive exclusive breastfeeding in rural areas were at greater risk of suffering from stunting compared to toddlers who did not receive exclusive breastfeeding in urban areas.

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The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) recommend that babies only be given breast milk for at least six months. Exclusive breastfeeding is recommended in the first six months of a baby's life because pure breast milk is not contaminated and contains many nutrients needed by babies at that age.[18] In line with WHO, the Minister of Health, through the Regulation of the Minister of Health (RMH) No. 15 of 2014, also stipulates the provision of exclusive breastfeeding for 6 months, without adding and/or replacing it with other foods or drinks.[19]

Breast milk is a fat emulsion in a solution of protein, lactose, and inorganic salts released by the mother's breasts, which is useful as a nutritional intake for babies. Breast milk is a white liquid produced by the mother's mammary glands during breastfeeding. Breast milk is a food that has been prepared for babies since the mother is pregnant.[20] Breast milk is the perfect food source with nutritional content that matches the body's needs and B12-binding protein, an essential amino acid that plays a vital role in increasing the number of baby brain cells and is related to the baby's intelligence.[21]

The results of the Meta-analysis conducted in this study strengthen the evidence that non-exclusive breastfeeding consistently increases the risk of stunting, both in rural and urban areas. In rural areas, toddlers who do not receive exclusive breastfeeding are at 3.84 times greater risk of stunting compared to toddlers who receive exclusive breastfeeding (OR=3.84; 95% CI=2.47–5.97; p<0.00001). For urban areas, toddlers who do not receive exclusive breastfeeding are at 2.38 times greater risk of stunting compared to toddlers who receive exclusive breastfeeding (OR=2.38; 95% CI=1.03–5.51; p=0.04). This means that toddlers who do not receive exclusive breastfeeding in rural areas have a greater risk of stunting compared to toddlers who do not receive exclusive breastfeeding in urban areas. The high risk of stunting in toddlers in rural areas is because rural areas have limited resources compared to urban areas, such as socio-economic levels, parental education and knowledge, and access to health services.[22,23,24,24,26]

The socio-economic level greatly influences families in meeting the nutritional needs of toddlers. The more excellent the opportunity to earn income, the healthier the choice of additional food and lifestyle habits. Low family income levels will cause stunting in children due to decreased purchasing power for quality food.[27] If access to food in the family is disrupted due to poverty, stunting in toddlers will occur.[28]

Parents, especially mothers with low education, will find it difficult to absorb information, which can put their toddlers at risk of stunting. Mothers with higher education will find obtaining information about the nutrition their children need easier.[29] Mothers must know how to meet nutritional needs to prepare for pregnancy, during pregnancy, and after birth to increase breast milk production. Efforts that can be made to overcome stunting include providing exclusive breastfeeding for 6 months, early breastfeeding when the baby is born, ensuring that food is available in reasonable quantity and quality, and receiving good and proper care.[30]

Access to health services that are too far and difficult to reach can be an obstacle for pregnant women to check their fetal health (antenatal). As a result, pregnant women lack information related to nutrition during pregnancy, even though stunting prevention can be done starting from the age of 0 days. Checking children's health through health services can help mothers monitor their children's growth and development to avoid malnutrition and disease infections.[31]

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CONCLUSION

Based on the results of the study, it can be concluded that toddlers in rural and urban areas who do not receive exclusive breastfeeding have a greater risk of experiencing stunting than toddlers who receive exclusive breastfeeding. However, toddlers who do not receive exclusive breastfeeding in rural areas are at greater risk of suffering from stunting compared to toddlers who do not receive exclusive breastfeeding in urban areas. This situation is influenced by complex factors such as socio-demographics, economics, and health services. Policy recommendations to address this problem include poverty reduction, education, and quality of health services, including antenatal checks. A holistic solution involving all stakeholders is needed to reduce the disparity between rural and urban areas.

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Declarations

Authors' contribution

RAW was responsible for the research design and data collection; AR provided data analysis and reviewed the manuscript.

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Conflict of interest

There is no conflict of interest in this research.

REFERENCES

1. Agustina SA& Rahmadhena MP. Analysis of Determinants of Toddler Nutritional Problems. Journal of Health. 2020;7(2):353–60. https://doi.org/10.35730/jk.v11i1.685 /
2. WHO. World Health Organization (WHO). Nutrition Landscape Information System (NLIS).2021.
3. UNICEF, WHO, WORLD BANK. Levels and Trends in Child Malnutrition. 2023:4.
4. Ministry of Health of the Republic of Indonesia. Stunting in Indonesia and Determinant Factors. In: SKI Thematic Report 2023. 2023.
5. FAO, IFAD, UNICEF, WEP, WHO. Urbanization, Agrifood Systems Transformation and Healthy Diets Across the Rural-Urban Continuum. In: The State of Food Security and Nutrition in the World 2023. Rome. 2023:1–316.
6. Basic Health Research (BHR). Balitbangkes Publishing Institute. 2018:1–627.
7. Indonesia Ministry of Health. Indonesian Health Survey (SKI) in Figures. Ministry of Health of the Republic of Indonesia. Central Jakarta. 2023:1–964.
8. WHO. Childhood Stunting: Context, Causes and Consequences WHO Conceptual framework. 2013.

9. WHO. Childhood Stunting: Context, Causes, and Consequences. World Health Organization (WHO). 2019:4.
10. Savita R& Amelia F. The relationship of maternal employment, gender, and exclusive breastfeeding with the incidence of stunting in toddlers aged 6-59 months in South Bangka. Journal of Health Polytechnic of the Ministry of Health of the Republic of Indonesia Pangkalpinang. 2020;8(1):1. https://doi.org/10.32922/jkp.v8i1.92
11. Pratama FI, Mayulu N, & Kawengian SES. The Relationship between Exclusive Breast Milk (ASI) and Stunting Incidence in Toddlers in Manado City. e-Biomedic Journal (eBm). 2019;7(2):156–60. https://doi.org/10.35790/ebm.v7i2.26873
12. Indonesia Ministry of Health. The 2022 Indonesian Nutritional Status Survey (SSGI). In: Ministry of Health. 2022:1–150.
13. Pratama MR & Irwandi S. The Relationship Between Exclusive Breastfeeding and Stunting at Hinai Kiri Health Center, Secanggang District, Langkat Regency. STM Medical Journal (Science and Medical Technology). 2021;4(1):17–25. https://doi.org/10.30743/stm.v4i1.65
14. Suryani L. The Relationship between Exclusive Breastfeeding and the Incidence of Stunting in Toddlers in the Limapuluh Kota Pekanbaru Health Center Work Area. Midwifery Update Journal (MU). 2021;3(2):126. https://doi.org/10.32807/jmu.v3i2.120
15. Suwartini I, Hati FS, & Paramashanti BA. History of Exclusive Breastfeeding and Stunting in Children Aged 24-59 Months in Pajangan and Pleret Districts, Bantul Regency. Journal of Food Nutrition Media. 2020;27(2):37–43. https://doi.org/10.32382/mgp.v27i2.1642
16. Lestari ED, Hasanah F,& Nugroho NA. Correlation between non-exclusive breastfeeding and low birth weight to stunting in children. Paediatrica Indonesiana. 2018;58(3):123–7.
17. Ministry of Village Regional Development Disadvantaged and Transmigration. Village pocketbook in handling stunting. 2017:42. https://doi.org/10.14238/pi58.3.2018.123-7
18. WHO. World Health Organization (WHO). Mums Need More Breastfeeding Support During Critical Newborn Period.2024.
19. Ministry of Health Republic of Indonesia (Ministry of Health of the Republic of Indonesia). Regulation of the Minister of Health of the Republic of Indonesia Number 15 of 2014. 2014:1–13.
20. Hajifah T, Kesumadewi T, Kunci K, Hangat K, & Tubuh S. Implementation of Health Education on Exclusive Breastfeeding to Improve Knowledge of Breastfeeding Mothers at Purwosari Health Center. Jurnal Cendikia Muda. 2022;2(September):423–8.
21. Astriana W & Afriani B. Weight Gain in Infants Aged 0-6 Months Reviewed from Breastfeeding. Jurnal 'Aisyiyah Medika. 2022:128–36. https://doi.org/10.0.143.121/jam.v7i2.860
22. Akram, R., Sultana, M., Ali, N., Sheikh, N., & Sarker, AR. Prevalence and Determinants of Stunting Among Preschool Children and Its Urban-Rural Disparities in Bangladesh. Food and Nutrition Bulletin. 2018;39(4):521–535. https://doi.org/10.1177/0379572118794770
23. Kalinda, C., Phiri, M., Simona, S.J., Banda, A., Wong, R., Qambayot, MA, Ishimwe, SMC, Amberbir, A., Abebe, B., Gebremariam, A., & Nyerere, JO. Understanding factors associated with rural-urban disparities of stunting among under-five children in Rwanda: A decomposition analysis approach. Maternal and Child Nutrition. 2023;19(3). https://doi.org/10.1111/mcn.13511
24. Tadesse, SE, Mekonnen, TC, Dewau, R., Zerga, AA, Kebede, N., Feleke, YW, & Muche, A. Urban-rural disparities in stunting among Ethiopian children aged 6–59 months old: A

multivariate decomposition analysis of 2019 Mini-EDHS. PLOS ONE. 2023;18(4 April):1–10. https://doi.org/10.1371/journal.pone.0284382

25. Grind, VGT, Uy, J., & Casas, LD. What explains the large disparity in child stunting in the Philippines? A decomposition analysis. Public Health Nutrition. 2022; 25(11):2995–3007. https://doi.org/10.1017/S136898002100416X
26. Widyaningsih, V., Mulyaningsih, T., Rahmawati, FN, & Adhitya, D. Determinants of Socio-Economic and rural-urban disparities in stunting: evidence from Indonesia. Rural Remote Health. 2022; 22(1):7082. https://doi.org/10.22605/RRH7082
27. Palupi FH, Renowening Y, & Mahmudah H. Mother's Knowledge About Nutrition Is Related to the Incidence of Stunting in Toddlers Aged 24-36 Months. Mahardika Health Journal. 2023;10(1):1–6. https://doi.org/10.54867/jkm.v10i1.145
28. Wahyuni D. Socio-economic influences on stunting incidence in Kulau Mining Village, Kampar. Preportif: Journal of Public Health. 2020;4(1):25. https://doi.org/10.31004/prepotif.v4i1.539
29. Tebi, Dahlia, Wello EA, Safei I, Rahmawati & Juniarty S. Literature Review of Factors Affecting Stunting in Toddlers. Fakumi Medical Journal: Journal of Medical Students. 2022;1(3):234–40.
30. Noorhasanah E & Tauhidah NI. The Relationship between Mother's Parenting Patterns and the Incidence of Stunting in Children Aged 12-59 Months. Journal of Pediatric Nursing. 2021;4(1):37–42. https://doi.org/10.32584/jika.v4i1.959
31. Solikhah LS, Huraera WR, & Imansari A. The Relationship between Mother's Characteristics, Services and Facilities of Integrated Health Posts (Posyandu) with the Participation of Toddler Mothers to Integrated Health Posts (Posyandu) in the Working Area of Kinovaro Health Center. Ghidza: Journal of Nutrition and Health. 2023;7(2):216–226. https://doi.org/10.22487/ghidza.v7i2.1000