

Determinants of stunting in children under five in rural areas

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ABSTRACT

Stunting is a major nutritional problem that will have an impact on social and economic life in society. Stunting is prone to occur in toddlers. Stunting toddlers tend to find it difficult to achieve optimal growth and development potential, both physically and psychomotor. This study is a systematic review using online databases, namely Scindirect, ProQuest, Scopus, and Google Scholar. The keywords used are stunting, toddlers, rural areas and their impact. The purpose of the systematic review is to analyze the factors that influence the incidence of stunting in children under five in rural areas. The results of the review show that the factors that influence the occurrence of stunting in children under five in rural areas are mother's education, family income, mother's knowledge of nutrition, exclusive breastfeeding, age of giving complementary feeding, levels of zinc and iron adequacy, history of infectious diseases. and genetic factors. However, for the mother's employment status, the number of family members, immunization status, energy adequacy level, and LBW status did not affect the occurrence of stunting. The factor that most influences the occurrence of stunting in children under five in rural areas is the level of zinc adequacy. It is recommended for the community to be active in outreach activities and other health activities carried out in order to improve health status and for mothers should routinely carry out weighing at the nearest posyandu so that the growth and development of children can be monitored and can be handled immediately if problems are found in the child's growth and development.

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INTRODUCTION

Reducing nutrition problems remains a challenge for every country in the world. Data from FAO, IFAD, UNICEF, WFP, and WHO (2018) show that the number of people suffering from malnutrition (malnutrition) has increased over the past three years, from 2015 784.4 million people increased to 820.8 million in 2017^{1,23,4}. Data from UNICEF, WHO, and World Bank (2019) also show that globally in 2018, 21.9% or ±149 million infants aged 0 to 59 months were classified as stunted, 7.3% Or 49 million infants 0-59 months were classified as underweight and 5.9% or approximately 40 million children 0-59 months were classified as ^{5,6} overweight. Indonesia has the

fifth highest prevalence of stunting in the world. The stunting rate among children under the age of 5 in Indonesia is 27.7%. The prevalence of stunting decreased from the previous year. The prevalence of stunting in Indonesia was 36.8% in 2007 (Riskesdas 2007) and 35.6% in 2010 (Riskesdas 2010), with no significant reduction or improvement⁵. According to Riskesdas (2013), the prevalence of stunting has risen to 37.3% in stunting-affected Indonesia.

The prevalence of stunting under 5 years of age in 2013 was higher than 35.8% in 2010, and fell again to 30.8% in 2018. On average 33.2% of children (infants) under the age of 5 suffer from developmental delay. This means that approximately one-third of children under the age of five in Aceh are below the average height of children. Stunting is a form of growth retardation due to accumulation of nutritional deficiencies from conception to 24 months of age. Stunting or short stature is a chronic disease that describes stunting that occurs due to chronic malnutrition^{6,7}.

Causes of stunting can be grouped into four broad categories, namely family factors, insufficient supplemental or supplemental nutrition, breastfeeding and infection⁴. Stunting is one of the nutritional problems common to poor and developing countries³. Indicators used to identify children with stunting were based on height-for-age (PB/U) or height-for-age (TB/U) with a threshold (z -score) < -2 standard deviation (SD) (Ministry of Health 2020). In Indonesia, child stunting exists not only in poor households, but also in economically strong groups or households with fairly good social and economic status^{8,9}. Other determinants of infant growth retardation were maternal height < 150 cm, maternal BMI < 18.5 kg/m², substandard gestational weight gain, suboptimal pregnancy food intake, and maternal education and economic status and low families. The higher the educational level and the family level, the lower the prevalence of stunted children^{10,11}. The purpose of this research is analyze the factors that influence the incidence of stunting in children under five in the region rural.

METHODS

Database searches include Google Scholar, Science Direct, and Proquest with the keywords Stunting in Toddlers. The next stage is to select articles according to the criteria, which are published in 2015-2020 with full text, in the preparation of Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) the articles that have been found are then synthesized and analyzed according to the inclusion and exclusion criteria. The inclusion criteria in this systematic review are (1) the occurrence of stunting in children under five in rural areas. Research can provide information about the determinants of stunting in children under five. While the exclusion criteria in this systematic review are (1): articles that do not describe the factors of stunting in children under five in rural areas. The search for articles began in August 2022 with keywords that had been determined by the researcher. The articles found by the researchers were selected according to the inclusion and exclusion criteria, with the keywords the occurrence of stunting in children under five in rural areas. The researcher deletes the published articles, examines the articles that meet the criteria and groups them according to the research results to proceed to the discussion.

RESULTS AND DISCUSSION

Initial literature search found 38 articles (Google Scholar 30 articles, Science Direct 4 articles, Proquest 4 articles) 23 articles issued were not in sync with the topic of discussion and did not discuss the occurrence of stunting in children under five in rural areas 15 full text articles met the criteria as listed in Image 1.

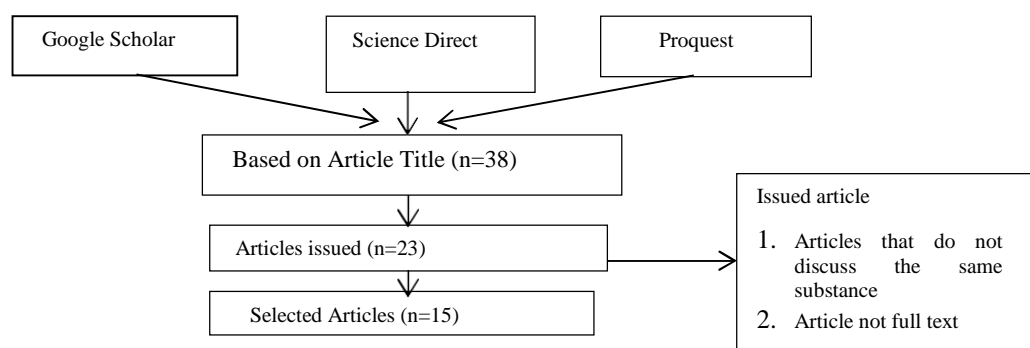


Figure 1. Flow diagram and article selection

The results of 15 articles found that the factors for stunting in children under five in rural areas were obtained by analysis of research articles in general.

Table 1. Factors for the occurrence of stunting in children under five in rural areas

No Title, author, year	Results
1 Determinant Factors of Stunting Incidence in School Age Children in Lubuk Kilangan District, Padang City ¹² Sulastri.2012.	From this study, it was found that the prevalence of stunting was 35.1%, most of the mothers had a higher education level (61%). The majority of mothers do not work (84%), maternal nutritional knowledge is still low (66%), more are in low economic levels (51%) Energy intake is more, which is <90% RDA (71%), while protein intake is more 90% RDA. From the statistical test found a significant relationship between maternal education level and economic level with nutritional status.
2 Analysis of Determinants of Stunting Incidence in Toddlers Age 12 to 60 Months ¹³ Hendrayati Hendrayati, Ramlan Asbar 2018	The results showed that the determinants of stunting in children aged 12 to 60 months were energy intake and macronutrients such as carbohydrates, proteins and fats. While the intake of micronutrients that affect the incidence of stunting is the intake of Vitamin A and Zinc. In addition to the intake of feeding practices such as consistency, frequency and breakfast are also determinants of stunting.
3 Analysis of Determinants of Growth Failure (Stunting) Incidence in Toddlers Age 12-36 Months in the Mountains Region of Bontongan Village, Baraka District, Enrekang Regency ¹⁴ Abraham, 2019	Based on the results of bivariate analysis, obtained $p\text{ value} > (\alpha=0.05)$ on the number of family members, gender, birth length, birth weight, exclusive breastfeeding, breastfeeding for up to two years, feeding practices and immunization status while the height of people old obtained $p\text{ value} < (\alpha=0.05)$. The determinant factor associated with the incidence of stunting is the height of the parents.
4 Determinants of Stunting and Underweight In Toddlers of Suku Anak Dalam in Nyogan Village, Muaro Jambi Regency in 2019 ¹⁵ Haris, 2019	The results showed that there was a relationship between the duration of breastfeeding and the incidence of stunting ($P = 0.011$; $PR = 2.92$; $95\% CI = 1.26-6.76$), and family size with the incidence of underweight ($P = 0.033$; $PR = 4.80$). ; $95\% CI = 1.61-14.25$). The determinants that were not related to the incidence of stunting and underweight were a history of infectious disease, immunization status, sanitation and food availability.
5 Determinants of stunting in infants aged 6 months in Semarang City ¹⁶ *Ardian Candra Mustikaningrum 2016.	The proportion of stunting was 39.6% in male babies and 60.4% in girls. Result of bivariate are low birth weight, the incidence of diarrhea, ARI, maternal education, and family economic level association with stunting, but result in multivariate determinant incidence of stunting is the family's economic level ($OR = 5.39$, $95\% CI = 2.73; 10.63$, $p < 0.001$), the incidence of acute respiratory infection ($OR = 2.29$, $95\% CI = 1.16; 4.51$, $p = 0.016$). The family's economic level, the incidence of acute respiratory infection, and the incident of diarrhea contribute to stunting by 30%..

6 Determinants of Stunting Incidence in Toddlers in Gianyar Regency, Bali ¹⁷ Subratha. 2020	The results showed that the factors associated with stunting were driving factors (mother's knowledge, exclusive breastfeeding), enabling factors (availability of funds, availability of family food), reinforcing factors (family support). All health workers should provide adequate information about the importance of nutrition for toddlers as early as possible. Provision of information can be provided through counseling to adolescents, mothers during pregnancy, postpartum and while breastfeeding when mothers visit ANC, attend classes for pregnant women, come to pusling, and when mothers visit posyandu.
7 Determinants of Stunting Incidence in Toddlers Age 24-59 Months in the Working Area of Silayang Health Center, Pasaman Regency ¹⁸ Noflidaputri,2020	The results of the univariate analysis were 66.7% were not LBW, 86.4% ate with a variety of foods, 63.2% avoided food, 50% had an unhealthy environment. Bivariate analysis revealed the relationship between stunting and low birth weight (p value = 0.019 and RR = 1.882), food diversity (p value = 0.031 and RR = 2.027), toddler eating behavior (p value = 0.001 and RR = 2.737) and environmental sanitation (p value) = 0.003 and RR = 2.300). It can be concluded that there is a relationship between LBW, food diversity, eating behavior of toddlers and environmental sanitation with stunting. Of all the variables that most influence is the eating behavior of toddlers.
8 Analysis Of Determinant Events Of Stunting In Toddlers (Age 24-59 Months) ¹⁹ Asmirin 2021	Results: It is known that the distribution of the frequency of stunting toddlers (45.8%) and normal toddlers (54.2%). There is a significant relationship between access to clean water (p value = 0.002), latrine access (p value = 0.005), CTPS behavior (p value = 0.041) on the incidence of stunting in children under five. There is no significant relationship between exclusive breastfeeding (p value = 0.834), MP-ASI (p value = 0.238) on the incidence of stunting in children under five. Suggestion
9 determinant factors of stunting toddlers in locus and non-locus villages in 13 stunting locus district in indonesia ²⁰ Permanasari.2019	The results showed that 20 percent lower chance of stunting in locus villages than non locus villages. Toddlers who are breastfed for more than 24 months have a 1.7 times risk of becoming stunted. Toddlers who do not do early initiation of breastfeeding have a 1.5 times risk of becoming stunted compared to toddlers who do early initiation of breastfeeding. High maternal education can prevent stunting 2 times compared to mothers with low education. The selection of stunting locus villages affects the prevalence of stunting. In addition, several determinant factors influence the incidence of stunting, namely the sex of the child, the duration of breastfeeding more than 24 months, the child's age, early initiation of breastfeeding, growth monitoring, the mother's age and the mother's education.
10 Epidemiological Determinants of Stunting Incidence in Children aged 6-12 Months in Kotamobagu City ²¹ Womb, 2022	The results showed that the variables associated with stunting were maternal height (p=0.048; OR=2.148), a history of anemia during pregnancy (p=0.036; OR=2.251), and birth weight (p=0.006; OR=2.885). . Unrelated variables were immunization status, history of diarrheal disease, and history of ARI. The dominant variable associated with stunting in children aged 6-12 months was birth weight (p=0.001, OR=3.629; 95% CI:1.671-7.881).
11 Factors Affecting the Incidence of Stunting in Toddlers in MalaNG District ²² I Dewa Nyoman 2021	The causes of stunting are based on the most influencing factors in order, namely: family income, exclusive breastfeeding, family size, education of toddler's father, job of toddler's father, nutritional knowledge of toddler's mother, family food security, education of toddler's mother, level of toddler's carbohydrate consumption, accuracy the provision of MP-ASI, the level of fat consumption for toddlers, history of infectious diseases for toddlers, socio-culture, levels of protein consumption for toddlers, work of mothers for toddlers, levels of zi behavior, energy consumption levels for toddlers, and completeness of immunization for toddlers.
12 Determinants of Stunting Incidence in Toddlers Age 24-59 Months at Grong-Grong Health Center, Pidie Regency, 2019 ²³ Ramadan,2019	From the results of the study, it was found that as many as (36.05%) children experienced stunting, nutritional status of pregnant women (9.3%) SEZ, low birth weight babies (8.14%), with risky birth spacing (17.4%), who did not give exclusive breastfeeding (80.2%), and who had infectious diseases (63.0%). From statistical analysis, it can be concluded that there is a relationship between breastfeeding (p = 0.004), infectious diseases (p = 0.001), and there is no relationship between the nutritional

status of pregnant women (0.494), low birth weight ($p = 0.695$), and birth spacing. (0.405) with stunting in children under five.

<p>13 Determinants of the Nutritional Status of Toddlers at Boilan Health Center, Buol District ²⁴</p> <p>Ramadhani Firdaus. 2021</p>	<p>From the results of the bivariate analysis, it was found that knowledge status ($p = 1,000$), history of infectious diseases ($p = 0.211$), family economic status ($p = 1,000$) and diet ($p = 0.211$) did not have a significant relationship with nutritional status of children under five. It is suggested that mothers under five should provide more nutritious food and sufficient energy for their children, be active in participating in posyandu activities every month to monitor the growth and development of their children.</p>
<p>14 Determinants of Factors Occurring Stunting in Toddlers in East Kambingan Village and Talang Village, Saronggi Subdistrict, Sumenep Regency²⁵</p> <p>Panatariono, 2022</p>	<p>From the test results, it is known that maternal height affects the incidence of stunting in toddlers (p value: 0.005), mother's education affects the incidence of stunting in toddlers (p value: 0.011) and the first age when pregnant women affect the incidence of stunting in toddlers (p value: 0.015). The mother factor is an important dimension that must be a concern to avoid the risk of stunting under five. Preparing mothers from an early age through various policies and methods, will reduce the risk of stunting under five.</p>
<p>15 Relationship between Environmental Factors and Stunting Incidence in Toddlers in the Work Area of Taraweang Health Center, Pangkep Regency ²⁶</p> <p>Anas, 2022.</p>	<p>Spatial distribution of the determinants of stunting in the Taraweang Public Health Center, Pangkep Regency, namely, Host Factor (Mother's Education, Mother's Knowledge, History of Infectious Diseases, and History of Breastfeeding) and Environmental factors (Handwashing Habits with Soap and Drinking Water Management). (2) the relationship between the Host factor of Mother's Education and the incidence of stunting is 0.015 (3) the Host factor of Mother's Knowledge with the incidence of stunting is 1.00 (4) the relationship between the Host factor of History of Infection with the incidence of stunting is 0.001 (5) the relationship of the Host factor of the History of Breastfeeding exclusively with stunting incidence of 0.001 (6) relationship of environmental factors with the habit of Washing Hands with Soap (CTPS) with stunting incidence of 0.023 (7) relationship of environmental factors of Drinking Water Management with stunting incidence of 0.001,</p>

Discussion

Stunting or short stature is a chronic disease that describes stunting that occurs due to chronic malnutrition. Causes of stunting can be grouped into four broad categories, namely family and household factors, supplemental or supplemental nutritional deficiencies, breastfeeding, and infections¹. The nutritional status of young children may be caused by direct and indirect factors. A direct factor affecting the nutritional status of young children may be an unbalanced food intake, which weakens the body's resistance to infectious diseases. The indirect factors that affect our households' food security are childcare patterns, health services and environmental health. Understanding the mother's diet, education and skills will influence the diet and health care provided.

The direct causes of stunting in toddlers include inadequate food intake and diseases that can occur due to inappropriate feeding practices, recurrent infectious diseases, poor hygiene and parenting behavior. This situation is influenced by indirect causes of nutritional problems in children under five, namely lack of education and knowledge about child care, use of unclean water, unhealthy environment, low income and limited access to food³. Maternal education can influence decisions about children's health, as mothers are more selective in providing high-quality, nutritious foods to their children. In addition, this also influenced the application of parenting and the application of appropriate nutrition²⁷.

Father's education is associated with stunting, but mother's education is more strongly associated with stunting²⁸. Children have 2 times higher risk of stunting The proportion of lower

mothers is higher than that of highly educated mothers²⁹. Family economic status is significantly associated with pregnancy risk³⁰. There is a marked increase in stunting in economically disadvantaged families. Socioeconomic status predicts stunting in many low- and middle-income countries³¹ and has long-term effects on children's linear growth³². Children born to mothers with less education are twice as likely to be stunted as mothers with more education. The risk of stunting is 2 times higher for children of mothers with low education than mothers with higher education²⁹. Household economic status has a significant relationship with the risk of pregnancy³⁰.

Low economic status can cause children to have limited access to food, shelter, clean water, and health services, making them more vulnerable to stunting³³. Working mothers increase the chances of their children not getting exclusive breastfeeding. Stunting was found to be higher in children who were exclusively breastfed for less than 6 months, as many as 91.7% in the study³⁴. In this study it was found that most of the mothers were not anemic and had stunted children either based on hemoglobin levels (88.6%) or based on hematocrit levels (91.4%). There is a significant relationship between exclusive breastfeeding and the incidence of³⁴. Research in Southern Ethiopia and proves that toddlers who do not get exclusive breastfeeding at the age of 0-6 months are at high risk of stunting.

This shows that one of the causes of stunting in children aged 0-6 months is not getting exclusive breastfeeding³⁵. Research on the analysis of the determinants of stunting in children 0-23 months in poor areas in Central and East Java found that the determinants of stunting were the child's age (OR= 0.59), gender (OR= 0.71), area of residence (OR= 0.68) and education. Mother (OR=1.56)³⁶ Maternal age during pregnancy can affect the length of the baby at birth. In addition, the study found that factors that are determinants of stunting include low economic levels of families having a 5.39 times higher risk of stunting than families with good economic status, babies with low birth weights having a 2.46 times chance of experiencing stunting compared to normal born children and the incidence of ARI. and diarrhea can have a stunting effect of 2.29 times and 1.79 times compared to children who rarely experience ARI and diarrhea³⁷.

CONCLUSION

The factors that influence the occurrence of stunting in children under five in rural areas are mother's education, family income, mother's knowledge of nutrition, exclusive breastfeeding, age of giving complementary feeding, levels of zinc and iron adequacy, history of infectious diseases, and genetic factors. However, for the mother's employment status, the number of family members, immunization status, energy adequacy level, and LBW status did not affect the occurrence of stunting.

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