International Journal of Multidisciplinary Research and Growth Evaluation.

Causes of Stunting in Toddlers: Literature Review

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Article Info

ISSN (Online): 2582-7138
Volume: 03
Issue: 01
January-February 2022
Received: 12-12-2021;
Accepted: 28-12-2021
Page No: 138-142
DOI:
https://doi.org/10.54660/anfo.2021.3.1.11

Abstract
Stunting in children is the main indicator in assessing the quality of human capital in the future. Growth disorders are suffered by children early in life, in this case, stunting can cause permanent damage. The nutritional status of under-fives is the cause of 2.2 million of all causes of under-five mortality worldwide. The purpose of writing this literature review is to analyze what factors cause a child to suffer from stunting. The method used in collecting journals uses Science direct, Sci-hub, and Google Scholar published from 2010 to 2020. The results of this literature review are that stunting in children under five is caused by several factors including low birth weight (LBW), breastfeeding exclusive, maternal parenting, economic factors, maternal education, and environmental sanitation including clean water sources.

Keywords: malnutrition, under-five nutrition, stunting, risk factors, toddlers

Introduction

Infancy is an important period in the process of human growth and development. Development and growth at that time became a determinant of the success of the growth and development of children in the next period [1]. Stunting is one of the problems nutrition that is faced by the world, especially poor and developing countries, which until now needs attention. The impact of stunting is not only felt by individuals who experience it but also has an impact on the economy and development of the nation. This is because stunting human resources have lower quality than normal human resources [2, 3, 4, 5].

According to the World Health Organization (WHO), the prevalence of stunted toddlers becomes a public health problem if the prevalence is 20% or more. Compared to several neighboring countries, the prevalence of stunting in Indonesia is also the highest compared to Vietnam (23%), Malaysia (17%), Thailand (16%), and Singapore (4%) [6]. The national short prevalence in 2013 was 37.2% and in 2018 it was 30.8%, which means it has decreased, but it still does not meet the 2019 National Medium-Term Plan target of 28%. The highest percentages in Indonesia in 2018 were in the provinces of East Nusa Tenggara (26.7%), West Sulawesi (25.4%), and West Nusa Tenggara (24.3%). Riau Province is ranked 25th (17.1%) [7].

Stunting has long-lasting effects on adulthood. The impact is causing impaired cognitive and psychomotor function development, decreased intellectual ability and work production, delays in brain development and can also decrease or decrease the body's resistance to infectious diseases [8, 9, 10]. Stunting children have
the average IQ is 11 points lower and has a below-average learning achievement than children who are not stunted [11].

Factors that cause stunting in children under five are maternal education, parental income, parenting, non-exclusive breastfeeding [11]. This is in line with research conducted in Bangladesh in 2018 where the results showed that the stunting factor was caused by parental education factors [12, 13]. Other studies mention the factors that cause stunting are toddlers who have a history of infectious diseases, low birth weight infants (LBW), family income/economic factors [14, 15, 16].

Stunting is a toddler with chronic nutritional problems, whose nutritional status is based on Body Length for Age (PB/U) or Height for Age (TB/U) when compared to the 2005 WHO-MGRS (Multicentre Growth Reference Study) standard. z-score <-2 Standard Deviation (SD) [17, 18].

Stunting is the result of chronic malnutrition and often occurs between generations coupled with the frequent disease. This is the hallmark of endemic poverty. Stunting is associated with lower cognitive development and productivity. Stunting in children is the main indicator in assessing the quality of human capital in the future. Growth disorders are suffered by children early in life, in this case, stunting can cause permanent damage. The success of sustainable economic improvement can be assessed by reducing the incidence of stunting in children aged under 5 years [19].

Toddlers are individuals or groups of individuals from a population who are within a certain age range. Toddler age can be grouped into three groups, namely the infant age group (0-2 years), the toddler group (2-3 years), and the preschool group (>3-5 years). Meanwhile, according to WHO, the toddler group is 0-60 months [20].

After analyzing several journals, both national and international journals, it was found several factors causing stunting in children under five, including; low birth weight (LBW), not exclusive breastfeeding, maternal parenting, family economic factors, maternal education, and the influence of environmental sanitation [21, 22, 23, 24].

The purpose of this literature review is to analyze the causative factors of stunting in children under five.

Methods

The design of this research is a literature review. A literature review or literature review is a literature search and research by reading various books, journals, and other publications related to the research topic, to produce an article regarding a particular topic or issue. The writing this literature review is based on a collection of the best international journals as well as national. Journals are collected through databases, Sciencedirect, Google Scholar. At the initial stage, the articles collected were 95 journals using the keywords malnutrition, stunting in toddlers, stunting in toddlers, risk factors for the incidence of stunting in children under 5 years of age. After identification relevant to the title only 50 journals. 46 journals have good quality and are closely related to the title, 4 data from the Indonesian Ministry of Health. As for 45 other journals related to factors of stunting that were not included in the literature review, such as immunization factors, father's education, heredity factors

Results and Discussion

Based on the journals that have been reviewed, several factors cause stunting in children under five in several countries, namely:

A. The effect of LBW on the incidence of stunting in toddlers

Low birth weight or often referred to as LBW are babies with birth weight less than 2500 grams. Many factors influence the incidence of LBW, especially those related to the mother during pregnancy [25]. In developing countries babies with low birth weight (LBW) are more likely to experience intrauterine growth retardation that occurs due to poor maternal nutrition and increased infection rates compared to developed countries. The impact of babies who have low birth weight will last from one generation to the next. Children who are LBW in the future will have fewer anthropometric measurements in adulthood [26].

Research conducted by Blake *et al* found that there was a significant relationship between LBW (<2.5kg) and the incidence of stunting in toddlers (p-value <0.001) with an OR of 3.82 (95% CI 2.29-6.37). The risk of stunting will increase 3 times in children who are born weighing less than 2500 grams [27, 28]. In a study conducted by Rashmi *et al*, it was also found that there was a significant relationship between LBW and the incidence of stunting under five in Indonesia (p-value = 0.047) [29]. Birth weight, in general, is strongly associated with fetal, neonatal, and post-neonatal mortality, infant and child morbidity, and long-term growth and development [30].

B. The effect of exclusive breastfeeding on the incidence of stunting in toddlers

Exclusive breastfeeding is giving only breast milk for babies from birth to 6 months of age. However, there are exceptions, infants are allowed to take medicines, vitamins, and mineral drops on the advice of a doctor [31].

According to research conducted by Angelina, *et al*. The results showed that there was an effect of non-exclusive breastfeeding on the incidence of stunting in children with a p-value = 0.028 OR = 2.808. This study is also in line with research conducted by Paudel R (2012) in Nepal which stated that the risk of children becoming stunted was 6.9 times if they did not receive exclusive breastfeeding [32, 33]. There are many reasons why a mother does not give breast milk to her child, including breast milk does not come out, busy working, a child does not want to breastfeed, etc. Whereas the function of breast milk as an anti-infective can affect changes in stunting status in toddlers. Insufficient duration of breastfeeding and feeding or formula feeding too early can increase the risk of stunting because babies tend to be more susceptible to infectious diseases such as diarrhea and ARI [5, 34].

C. The influence of mother's parenting style with stunting in toddlers

Parenting is a parenting practice that is carried out in the household and is realized by the availability of food and health care and other sources for survival. Parenting is one of the indirect factors related to the nutritional status of children including stunting [35].

The role of the family, especially the mother in raising children, will determine the child's growth and development. Mother's behavior in breastfeeding or feeding, healthy eating, providing nutritious food, and controlling the large portion spent will improve the nutritional status of children [10, 36].

The results of the study from Yudianti stated that there was a relationship between maternal parenting and the incidence of stunting in toddlers, this was because parenting patterns such as how to feed children were not appropriate. Where inappropriate feeding of children can increase the risk of 2.4 times compared to children who are properly fed (OR = 2.4) [37].

D. The influence of economic factors with the incidence of stunting in children under five

According to Walker *et al*., linear growth retardation or stunting is estimated to affect 34% of children aged less than 5 years in low-middle income countries. In addition, the family's economic status is seen as having a significant

impact on the probability of a child being short and thin [38]. Both in Indonesia and Ghana, economic factors can indirectly affect children's nutritional status because economic factors are closely related to chronic malnutrition in children, besides that access to health services is very difficult, this is evidenced by research conducted by Hendra in Banda Aceh and Hong in Ghana, they stated that children under five from low-income families had a 3 times risk of developing stunting compared to high-income families [39, 40].

Improvement and improvement of nutrition requires economic, social and other improvements. Currently, there is an economic crisis in Indonesia, which greatly affects people's purchasing power. Families with less socio-economic conditions accompanied by a large number of children will result in not only lack of attention and affection for children but also needs such as food, clothing, and housing or housing cannot be met [41].

E. The effect of mother's education on the incidence of stunting in toddlers

Like many other developing countries, education is an important issue for Indonesia. Education and work of parents, especially from mothers, can be expected be important. Children whose mothers have higher education have shown better growth [29, 42].

The results of the evidence from Bangladesh which were examined by Siddiqi (2011), stated that the level of education will affect food consumption through the selection of food ingredients. People with higher education tend to choose food ingredients that are better in quality and quantity of dishes than those with low or moderate education. The higher the level of education, the better the nutritional status of the child [43].

Research conducted by Nguyen *et al*. in Vietnam, it was found that in general the measurement of stunting was most common in boys and children whose mothers had low education, especially in rural areas, which was 54.8% [44]. This is also in line with the research conducted by Senbanjo in southwestern Nigeria which found that mothers with low education have a 2 times risk of having stunted children [45].

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F. Effect of environmental sanitation on the incidence of stunting in toddlers

Based on research conducted by Tasnim in Southeast Sulawesi, it was stated that children under five from households that did not have water facilities at home were 5 times more likely to be at risk of stunting than households where water facilities were available at home (OR 5.0; 95%CI 2, 7 – 9.5; $p < 0.001$) [47]. This study is also in line with research conducted by Kanvosi in Kars Province in Iran which states that toddlers whose homes do not have good environmental sanitation are at risk of stunting than toddlers who live in homes with good environmental sanitation [48].

Environmental health is essentially a condition or state of the environment optimally so that it has a positive effect on the realization of a good health status optimum too. The scope of environmental health includes: housing, disposal of human waste (feces), provision of clean water, waste disposal, disposal of dirty water (waste water), livestock housing (cages), and so on. Unfavorable environmental conditions allow the occurrence of various diseases including diarrhea and respiratory tract infections. This situation indicates that environmental factors as determinants of stunting do not stand alone, other factors significantly affect stunting jointly affect stunting such as infectious diseases and parenting. Children frequent illness will affect poor food intake so that the child's growth will be disrupted [49, 50].

Conclusion

Stunting is a health problem in toddlers that needs attention both from the government and especially parents, because stunting has long-term effects if not handled properly. The role of parents, especially mothers, is very important because it is the mother who usually prepares the nutritional intake of the child. Based on the results and discussion in this literature review, it is found that the low birthweight factor (<2,500 grams) has a significant influence on the incidence of stunting in children and has a risk of experiencing stunting 3 times. The factor of children who are not exclusively breastfed has an effect of 6.9 times for being stunted. Mother's parenting is also one of the factors for children to be stunted as much as 2.4 times if the parenting pattern is not good. The mother's education factor has a significant influence on the incidence of stunting in children and has a risk of experiencing stunting 2 times. The factor of low household income was identified as one of the significant causes for stunting in toddlers by 3 times. Poor sanitation factors have a significant influence on the incidence of stunting in toddlers and have a risk of experiencing stunting up to 5 times. The exclusive breastfeeding factor is the most dominant for children to become stunted.

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