

Correlation between Family Income and Stunting among Toddlers in Indonesia: A Critical Review

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ABSTRACT

Background: Toddlers aged 12 months to 59 months, are included in the nutritional vulnerable group and easily suffer from nutritional problems such as stunting. Based on the results of the Ministry of Health's basic health publications in 2018, the prevalence of stunting in toddlers in Indonesia reached 30.8%. Stunting in toddlers can be caused by several factors, including family income. **Objective:** The purpose of this critical review study is to review and critique articles on family income with stunting in toddlers, including: abstract, theoretical theory, methodological, results and discussion, conclusions, and recommendations aspects. **Methodology:** This study, was a critical review of 10 articles related to family income with the incidence of stunting in toddlers from a database of national reputable journals in the last 10 years. **Results:** Based on the results of a review of 10 selected research articles using cross-sectional and case-control methods, the prevalence of stunting in toddlers was 17.2-59.3%. The majority of families have low income categories, with the highest prevalence of 71.4%. As many as 70% of the articles stated that the results of their research showed that there was a relationship between family income and the incidence of stunting in toddlers with $p < 0.05$. **Conclusions:** The results of this critical review show that family income is related to the incidence of stunting in toddlers, so it is necessary to follow up on planning and implementing programs to prevent stunting in toddlers.

Keywords: Family Income, Stunting, Toddlers

1. INTRODUCTION

One of the nutritional problems experienced by toddlers in the world today is the incidence of stunting or stunting. According to data from Joint Child Malnutrition Estimates, globally, in 2020 there are 22.0% or around 149.2 million children under the age of 5 years (toddlers) experiencing stunting. The number of children with stunting is decreasing in all regions except Africa [1].

Stunting is a health problem that is often found in developing countries, including Indonesia. Based on the results of the Indonesian Ministry of Health's basic health publications in 2018, the status of children under five in Indonesia who experienced stunting reached 30.8%, this proves that almost a third of the total number of children under five in Indonesia has stunting problems. This figure is still far above the limit set by WHO, which is 20% [2].

Stunting is a condition of nutritional status based on the length or height-for-age index which presented by Z-Score (HAZ) in anthropometric standards for assessing children's nutritional status with the measurement results being at the threshold (Z-score) < -2 SD to -3 SD (short toddler), and < -3 SD (very short). Stunting is a chronic nutritional problem affected by nutritional deficiencies or other disease or exposures [3].

The incidence of stunting in toddlers can be influenced by several factors, both direct and indirect factors. One of the indirect factors that can influence the incidence of stunting in children under five is indicators of household wealth. Low household socio-economic status is particularly important child stunting determinants. Children in families with low economic levels are more at risk of stunting because of their low ability to fulfill nutrition [4].

Family income determines economic conditions which are closely related to the ability to fulfill nutritious intake and health services for pregnant women and toddlers. Based on data from Joint Child Malnutrition Estimates in 2018, countries with upper middle income levels were able to reduce stunting prevalence by 64%, while countries with lower middle income levels were only able to reduce stunting prevalence by around 24% from 2000 to 2017. Low income levels actually experienced an increase in the incidence of stunting in 2017 [5].

Research conducted by Suryanegara and Reviani [6] states that there is a relationship between family income and the incidence of stunting in toddlers with a p value of 0.000 ($p < 0.05$). This is different from the research conducted by Krisnana et al. [7] which stated that there was no relationship

between family income and the incidence of stunting in children under five with a p value of 0.784 ($p > 0.05$).

In this study, the author wanted to focus research on the topic of family income relationships. With the incidence of stunting in toddlers with the provisions of articles of national reputation SINTA (S1-S4), and research respondents are mothers who have toddlers aged 0-59 months so that 10 appropriate articles are obtained. Therefore, the authors interested in conducting research with a critical review design to be able to examine more deeply the relationship between family income and the incidence of stunting in children under five in Indonesia.

2. RESEARCH METHODS

This study design is critical review. The independent variable used is family income and the dependent variable used is the incidence of stunting in children under five. The search engine used to find relevant articles or journals is Google Scholar. Based on the author's search regarding articles related to family income with the incidence of stunting in toddlers, 3360 articles were obtained, some of these articles were selected with the provisions of the year published in the last 10 years so that 3220 articles were obtained. The identified articles were then selected with the provisions of full text articles, and in Indonesian or English so that 250 articles were obtained. The identified articles used several research methods, but the researchers focused on using cross-sectional and case-control methods so that 43 articles were obtained. In this study, the data used came from critical review analysis on 10 articles relevant to the title or theme from a nationally reputable database source (SINTA 1-4 from link <http://sinta.ristekbrin.go.id/>) within a period of ten last year is from 2011 to 2021. The findings in the study were analyzed or criticized and then compiled based on the critical review procedure.

3. RESULTS

3.1. Basic Concept of Family Income

Household wealth refers to data describing the assets, family income, and liabilities held by individual households. Family income is the amount of real income of all household members used to meet joint and individual needs in a household [8].

According to Arif [9] income level is the level of a person's acquisition based on the results of work or business, assets received as a result of all the efforts made. The level of family income can be known by calculating the ratio between per capita income in the community. If the income is above the

average or more than the level of expenditure for the minimum basic needs, the community can be said to be not poor.

Based on the results of a review of 10 articles, none of the articles mentioned the basic concept of family income in their research articles. The majority of articles only mention that family income is one of the risk factors for stunting in toddlers and the mechanism by which family income is related to stunting in toddlers.

The majority of articles categorize family income levels based on the regional minimum wage. In the research of Ibrahim and Faramita [10], family income is said to be high if the regional minimum wage of Makassar Regency in 2014 is more than Rp1,900,000/month is equivalent to 132.075 USD. In the research of Rahayu et al. [11], family income is categorized into two, namely low and high. Family income is low if $< \text{Rp}1,454,154/\text{month}$ and high if $\geq \text{Rp}1,454,154/\text{month}$ is equivalent to 101.082 USD. This income refers to the value of the regional minimum wage of Yogyakarta Province in 2018.

In Illahi's research [12] family income is categorized into two categories, namely low and high based on the regional minimum wage of Bangkalan Regency, East Java, categorized as low family income if $< \text{Rp}1,414,000$ and high family income if $\geq \text{Rp}1,414,000$ is equivalent to 98.291 USD.

3.2. Basic Concept of Stunting

Stunting is an assessment of nutritional status in toddlers based on indicators of body length or height-for-age where the results of anthropometric measurements show Z-score < -2 SD to -3 SD (short) and < -3 SD (very short) [6]. According to WHO [13] Stunting is a chronic condition that describes stunted growth due to long-term malnutrition. Stunting is based on indicators of body length or height-for-age where the results of anthropometric measurements show Z-score with a limit (z-score) < -2 SD. Stunting represents chronic under-nutrition (due to insufficient nutrient intake related with household food insecurity, low-quality food, and inadequate infant feeding practices in the first two years or low intake of nutrient in five years of their life) [14].

3.3. Relationship between Family Income and the Incidence of Stunting

There are four main factors that cause stunting, namely household and family factors (mother/maternal factors and internal environment in home), insufficient feeding practices (low quality of foods, inadequate intake, and physical, chemical

and microbiological food/water hazard), inadequate breastfeeding, and infection disease. [15].

The economic status of parents as a risk factor for stunting is caused by the economic level that can affect the family's ability to meet the nutritional needs of toddlers, the choice of types of additional food and the timing of feeding and healthy living habits [16]. This finding similar to the research of Nuraeni and Suharno [17] that discovered about the low of family income cause their limitations in serving nutritious and diverse foods.

Socio-economic and environmental factors are associated with the propensity of stunting. The low level of income will indirectly lead to stunting. This is due to a decrease in food purchasing power both in quantity and quality so that it affects the occurrence of food insecurity in the family [18].

Economic status in this case is family income per capita is also a risk factor for stunting in children under five. Income is one indicator that determines economic status. The results of research in Nepal show that the household wealth index is a risk factor for stunting [19]. Low economic status is considered to have a dominant influence on the incidence of stunting in children. This is because accessibility to consumption in the household is related to

household food security. Based on the study of Rosha et al. [20].

Family with low income will manage spending for shopping by relying on limited income. Even though the staple food and side dishes can be met every day, but the quality and the quantity is not considered, so that low economic status can indirectly cause stunting in toddlers. According to FAO [21] low family income can caused food insecurity, it can worsen diet quality and accordingly increase the risk of various forms of malnutrition, potentially leading to under-nutrition as well as stunting.

In this critical review, we will examine the relationship between family income and the incidence of stunting in children under five in 10 selected articles according to predetermined criteria. The variables studied were family income as the independent variable and the incidence of stunting in children under five as the dependent variable. The characteristics of the articles that will be displayed discuss the important elements in a research article such as the name of the researcher, the year of publication, and the results of the univariate and bivariate analysis of each selected article, and the conclusion of the research. The results of the extraction of 10 articles will be shown in table 1.

Table 1. The Characteristics of 10 Reviewed Articles

| No | Author/Year | Characteristics | Results | Conclusion |
|----|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 1 | Marbun et al., 2019 [22]. | <ol style="list-style-type: none"> The prevalence of stunting under five is 59.3%, while under five is not stunted as much as 40.7%. The prevalence of families with low incomes is 53.5%, while families with high incomes are 46.5% | <ol style="list-style-type: none"> p value = 0.000 As many as 82.9% of stunting toddlers come from low-income families. | There is a significant relationship between socioeconomic level and the incidence of stunting. |
| 2 | Wahdah et al., 2015 [23]. | The prevalence of stunting for toddlers is 46.7%, while toddlers are not stunted as much as 53.3% | <ol style="list-style-type: none"> p value < 0.001 A total of 42 (85.7%) children under five who experienced stunting came from low-income families | The incidence of stunting was significantly related to family income . |
| 3 | Ngaisyah, 2015 [24]. | Univariate test results are not shown | <ol style="list-style-type: none"> p value = 0.036 A total of 67 (35.8%) children under five who experienced stunting came from families with low incomes under | There is a significant relationship between family income and the incidence of stunting. |

| No | Author/Year | Characteristics | Results | Conclusion |
|----|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| | | | regional minimum wage. | |
| 4 | Setiawan et al., 2018 [16]. | <ol style="list-style-type: none"> 1. The prevalence of stunting under five is 26.9%, while under five is not stunted it is 73.1% 2. The prevalence of families with low incomes is 14.9%, while families with high incomes are 85.1% | <ol style="list-style-type: none"> 1. p value = 0.018 2. As many as 60.0% of children under five who experience stunting come from families with poor (low) income. | There is a significant relationship between family income and the incidence of stunting in children aged 24-59 months. |
| 5 | Ibrahim and Faramita, 2014 [10]. | <ol style="list-style-type: none"> 1. The prevalence of very short toddlers is 17.2%, short toddlers are 37.5%, and toddlers normal as much as 45.3%. 2. The prevalence of families with low incomes is 71.4%, while families with high incomes are 28.6%. | <ol style="list-style-type: none"> 1. p value = 0.599 2. As many as 18.2% of very short toddlers come from families with less income. As many as 38.7% of short toddlers come from families with less income. | There was no relationship between parent's income and the incidence of stunting in children aged 24-59 months. |
| 6 | Yuniarti et al., 2019 [25]. | The prevalence of stunting toddlers is 56.8% male, 43.2% stunting toddlers is female. | <ol style="list-style-type: none"> 1. p value = 0.038 2. A total of 29.7% of stunting under-fives came from families with less economic status. | Economic status (per capita income) is one of the risk factors for stunting. |
| 7 | Rahayu et al., 2019 [11]. | The prevalence of families with low income in the case group was 62.0%, while families with high income in the control case were 80.0% | <ol style="list-style-type: none"> 1. p value = 0.000 2. A total of 62.0% of children under five in the case group (stunting) come from families with low incomes. | There is a significant relationship between family income and the incidence of stunting. |
| 8 | Amin and Julia, 2014 [26]. | No univariate test is included. | <ol style="list-style-type: none"> 1. p value = >0.05 2. A total of 27.78% of children under five in the case group (stunting) came from families with sufficient income (quartile 3). | Sociodemographic factors (family income) are not a risk factor for stunting. |
| 9 | Raharja et al., 2019 [27]. | 1. The prevalence of stunting under five is 33.3%, while under five | <ol style="list-style-type: none"> 1. p value = 0.002 2. A total of 79.2% children under five in | The economic status of parents (family income) is a |

| No | Author/Year | Characteristics | Results | Conclusion |
|----|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| | | is not stunted as much as 66.7%. | the case group (stunting) came from families with low economic status. | risk factor for stunting in children under five. |
| | | 2. The prevalence of families with low incomes is 51.8%, while families with high incomes are 48.2%. | | |
| 10 | Illahi, 2017 [12]. | 1. The prevalence of stunting under five is 29.0%, while under five is not stunted as much as 71.0%. 2. The prevalence of families with low incomes is 54.8%, while families with high incomes are 45.2%. | 1. p value = 0.08 2. As many as 38.2% of stunting toddlers come from low-income families. | There is no relationship between family income and the incidence of stunting. |

4. DISCUSSION

Of all the articles that have been reviewed, 70% of the articles state that there is a relationship between family income and the incidence of stunting in children under five with the p value generated from each study being different. According to research by Soekarti et al. [28], there is a relationship between very poor socioeconomic status ($p=0.02$) and poor socioeconomic status ($p=0.02$) with the incidence of stunting in children under five. The results showed that families in the normal toddler group tended to have sufficient income (50%) compared to families with stunting toddlers (23.5%). There is 1 article that is wrong in giving conclusions on the results of the bivariate test, namely in the Illahi's article [12]. The results showed that the p value was 0.08, which means that there is no relationship between family income and the incidence of stunting in children under five, but in the article it is stated that there is a relationship between family income and the incidence of stunting in children under five.

Family economic status has a significant impact on the incidence of stunting because families with good economic status have the opportunity to obtain better public services such as education, health services, food health insurance, and sanitation so that it can affect the nutritional status of children under five. In addition, the economic status of the family will affect the purchasing power of the family. Families with high economic status will have access to better food than families with low economic status.

Titaley's research [29] also states that there is a relationship between the household wealth index (income) and the incidence of stunting. The results of this study stated that as many as 40.9% of stunting

toddlers came from families with low incomes (poor) and as many as 28.7% of stunting toddlers came from families with high incomes. A higher wealth index/higher family income reflects an increased ability of households to be able to access quality food and health services, as well as better and safer sanitation facilities. This study also concluded that there is a relationship between households with a low wealth/income index with the incidence of stunting in children under five. This can happen due to low access to food and inadequate fulfillment of a variety of healthy and safety foods.

The study by Halimatunnisa et al. [30], also stated that household income is the most influential factor in the incidence of stunting in children under five. Families with incomes lower than the minimum wage are 6.625 times more likely to have children with stunting. Socio-economic inequality is related to the work and income of parents. Fathers who do not work increase the risk of stunting in children by 1.045 times compared to fathers with decent occupation. This causes family income to have a relationship with the risk of a double nutritional burden associated with the risk of food insecurity. Households with food insecurity are at risk for stunting children.

Based on the results of the overall review of articles, there are 3 articles whose test results state that there is no relationship between family income and the incidence of stunting in toddlers ($p>0.05$), namely in the articles of Ibrahim and Faramita [10], Amin and Julia [26], and Illahi [12]. In one of the articles Amin and Julia stated that the results of the study showed that there was no significant relationship between family income and the incidence of stunting ($p>0.05$) that inline with study of Husaini et al. [31], that found there is no relationship between family income and stunting

($p=1.111$). According to the article, this can happen because the family's ability to access food does not only depend on the size of the family's income, but also the price of the food itself and the level of management of home garden resources. Most of the households in Sedayu Sub-district have a yard so that they can meet their food needs. The other previous study found the prevalence of stunting among toddlers in Surakarta of 49.3% need attention to improve nutrient intake through the supplementary feeding [32] and maternal knowledge and perception including growth formulation preferences for under five children [33].

Judging from the abstract aspect, overall the majority of articles have included parts of the abstract completely starting from the background/problem identification, research objectives, research methods, research results, conclusions, and recommendations. In terms of the theoretical review aspect, the majority of articles have explained the identification of the problems that occurred, included the research objectives, and the majority of articles (60%) included a theoretical review/literature that explained the relationship between family income and the incidence of stunting in children under five. In terms of methodological aspects, all of the articles reviewed are research articles with quantitative research types, with the most widely used research design being cross-sectional with a total of 6 articles, and 33.3% used sampling technique is the simple random sampling technique.

Viewed from the aspect of results, the results of the univariate test of the entire article concluded that the prevalence of toddlers experiencing stunting varied from the lowest as much as 17.2% and the highest as much as 59.3%. Of the 10 articles that have been reviewed, the majority of families have low income categories, with the highest prevalence of 71.4%. Judging from the discussion aspect, from the results of the bivariate test of the entire article, 70% of the articles stated that the results of their research showed that there was a relationship between family income and the incidence of stunting ($p<0.05$). In terms of conclusions, 90% of the articles reviewed include conclusions in a separate conclusion chapter. In terms of the recommendation aspect, 70% of the articles reviewed include recommendations from the research that has been done in the conclusions and suggestions or recommendations chapters.

5. CONCLUSION

Based on the results of a critical review study on 10 selected articles, it can be concluded that 70% of articles stated that there was a relationship between

family income and the incidence of stunting in children under five. This condition still need improvement of synergetic program through family empowerment to increase the income such as the entrepreneurship skill to prevent the severe stunting among toddlers.

AUTHOR'S CONTRIBUTIONS

All authors contributed to the design and implementation of the research significantly. All authors performed analysis, interpreted the data, discussed, critically reviewed and writing of the manuscript.

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