

The Relationship Between Breast Milk Coverage, Mother's Education Level, Sanitation Hygiene, and Infectious Diseases and Incidents Of Stunting In Toddler In Bangkalan District, East Java

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ARTICLE INFO	ABSTRACT
<p>ORCHID ID Author 1: https://orcid.org/0000-0002-5115-0311 Author 2: https://orcid.org/0000-0003-0905-2475 Author 3: https://orcid.org/0000-0002-4118-7233 Author 4: https://orcid.org/0000-0002-4024-7310 Author 5: https://orcid.org/0009-0001-7504-8178 Author 6: https://orcid.org/0000-0001-6299-8855 Author 7: - Author 8: -</p>	<p>Stunting remains a pressing global health issue, with 149 million children affected in 2020. In Bangkalan District, East Java, stunting prevalence reaches 25.2 percent, exceeding the provincial average of 19.2 percent. This study aimed to analyze factors influencing stunting, including breastfeeding coverage, maternal education, hygiene, and infectious diseases. Conducted from August to September 2023 in the Blega Health Center area, this analytical correlation study involved 35 toddlers aged 24–59 months selected through simple random sampling. Data were collected via questionnaires, anthropometric measurements, and interviews, then analyzed using chi-square tests in SPSS. The results revealed significant relationships between exclusive breastfeeding and stunting (p value is less than 0.05) and between infectious diseases (e.g., diarrhea and URTI) and stunting (p value is less than 0.05). Toddlers not exclusively breastfed were 0.2 times more likely to be stunted, and those frequently suffering from diarrhea had a 0.13 times higher risk. However, no significant association was found between maternal education or hygiene behavior and stunting (p value is more than 0.05). These findings emphasize the importance of promoting exclusive breastfeeding and preventing infectious diseases as key strategies to combat stunting. Complementary measures, such as improving hygiene and sanitation, remain critical to creating a supportive environment for child growth and development.</p>
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1. Introduction

Statistical data reveals that in 2020, an estimated 149 million children under the age of five experienced stunting (too short for their age) and 45.4 million children experienced wasting (too thin for their height), with 13.6 million of them experiencing wasting (Komalasari et al., 2020). This is due to malnutrition or the presence of an infectious disease. Children with wasting have weakened immunity, are at greater risk of long-term developmental delays, and are more susceptible to infections, especially if they have serious levels of wasting. Most children with malnutrition live in Africa and Asia, with the prevalence of stunting in Southeast Asia at 8.2%. (UNICEF, 2021). Stunting is very common in several Southeast Asian countries,

including Indonesia (31,8%) (UNICEF, 2021). According to Indonesian Nutritional Status Survey (SSGI) 2022 data, several regions in Indonesia are reported to have a higher prevalence of stunting than the national average. Trends in the nutritional status of children under five in Indonesia in 2022 show an increase in cases of wasting and underweight children (SSGI, 2022). Bangkalan Regency in East Java Province is of significant concern because of the high prevalence of stunting (height for age) in the area at 25.2%. This prevalence is higher than the average stunting prevalence in East Java, which is around 19.2%. In addition, the prevalence of wasted toddlers in Bangkalan Regency reached 8.8%, and the prevalence of underweight toddlers (weight according to age) was 19.7%, so the prevalence of both is higher than the average incidence of stunting in East Java. (SSGI, 2022).

Stunting is caused by many factors that are related to each other (Kwami et al., 2019). Inadequate nutritional intake and infectious diseases are direct causes of stunting. Apart from that, stunting can also be caused indirectly by factors such as family food and nutrition security, parenting patterns, health services, and environmental health which includes water and sanitation. The main causes of stunting are associated with education, poverty, socio-culture, government policies and politics (Hartati & Zulminiati, 2020) (Rizqiyah et al., 2021). Apart from that, the dominant factor influencing the incidence of stunting in Indonesia itself is the lack of nutritional intake in early childhood which is usually also influenced by the level of family income and the mother's education level. (Nugroho et al., 2021). The late onset of stunting in children causes children to be shorter than their peers. Apart from the physical growth and development of stunted children, stunted children generally have cognitive abilities that cannot develop properly. So children are at risk of experiencing learning difficulties at school, having low incomes as adults, and facing obstacles when participating in community activities (Nisa et al., 2022).

Disturbances to children's nutrition in the long term will cause stunting in children, this will impact length/height according to age. Disruptions to children's nutrition in the long term will cause stunting in children, this will impact length/height according to age (Sumartini, 2020). So the incidence of stunting in children causes children to be shorter than their peers. Apart from affecting their growth patterns, stunted children will experience obstacles in their cognitive abilities. Therefore, children are at risk of experiencing learning difficulties at school, having low incomes as adults, and facing barriers when participating in community activities (Nisa et al., 2022).

This urgency creates a problem formulation related to the relationship between risk factors for stunting such as sanitary hygiene, exclusive breastfeeding coverage, education level, and infectious diseases with the incidence in Bangkalan District, East Java. Child growth and development disorders are complex problems and require contributions from many parties to overcome them. Thus, analysis related to risk factors that can cause stunting, such as sanitary hygiene, exclusive breastfeeding coverage, education level and the association of infectious diseases with the incidence of stunting in Bangkalan District, East Java is the purpose of this study

2. Method

Data were collected from mid-August to September 2023 at the Blega Health Center, Bangkalan Regency, East Java. The design of this research is analytical correlation observation research. Data collection includes filling out questionnaires by families who meet the inclusion

criteria of respondents, namely having toddlers or children aged 24-59 months. Data was collected by researchers with the help of health cadres to visit respondents and take anthropometric measurements. This research instrument is a questionnaire prepared by the researcher. All instruments used in this study have received ethical approval by the Airlangga University Health Research Ethics Licensing Commission with number 1002/HRECC.FODM/VIII/2023. Data was collected directly through filling out questionnaires. Furthermore, the data obtained is analyzed.

The data analysis method in this study uses descriptive methods. A total of 30 respondents were selected by simple random sampling by considering the inclusion criteria of respondents, namely toddlers or children aged 24-59 months. Meanwhile, the criteria for exclusion of respondents include children or families who are not willing to become research respondents. In carrying out research activities, there are several procedures that will be carried out. These procedures include: 1) Measurement using anthropometric data obtained using a microtoise, 2) Data processing through the WHO Anthro application using WHO-2005 standards, namely the TB/U index Z-score, 3) Interviews and questionnaires to review the duration and frequency of infectious disease history, weight at birth, exclusive breastfeeding history, and level of maternal knowledge. The data that has been collected is then reviewed to get a description of the frequency distribution through univariate analysis and tested using bivariate analysis with the Chi-square test to get the relationship between the two variables. The data that has been collected will then be analyzed using the SPSS application via the chi-square test to determine the relationship between the independent variables and the dependent variable.

3. Result and Discussion

Table 1. Relationship between Breast Milk Coverage and Stunting Incidence

Chi-Square Test		
	Value	Asympototic Significance (2-sided)
Continuity Correction	3,880	0,049

Source: Primary Data,2023

Based on table 1 The Asymp. Sig. (2-sides) Continuity Correction value of 0.049 is smaller than 0.05 ($0.049 < 0.05$), so it can be concluded that there is a relationship between the scope of breastfeeding and the incidence of stunting.

Table 2. Relationship between Education Level and Stunting Incidence

Chi-Square Test		
	Value	Asympototic Significance (2-sided)
Continuity Correction	0,862	0,353

Source: Primary Data,2023

Based on table 2 The Asymp. Sig. (2-sides) Continuity Correction value is 0.353, this value is greater than 0.05 ($0.353 > 0.05$), so it can be concluded that there is no relationship between the level of maternal education and the incidence of stunting.

Table 3. The Relationship between Hygiene and Sanitation and Stunting Incidence

	Test Statistics
	Mann-Whitney U
Z	-1,567
Asymp. Sig. (2-tailed)	0,117

Source: Primary Data,2023

Based on table 3 The Asymp. Sig. (2-tailed) value of 0.117 is greater than 0.05 (0.117 < 0.05), so it can be concluded that hygiene and sanitation behavior has no significant relationship with Stunting Incidents.

Table 4. The Relationship between Infectious Diseases and Stunting Incidence

Chi-Square Test		
ISPA		
	Value	Asymptotic Significance (2-sided)
Continuity Correction	6,240	0,012
DIARE		
	Value	Asymptotic Significance (2-sided)
Continuity Correction	5,553	0,018

Source: Primary Data,2023

Based on table 4, the Asymp. Sig. (2-sides) Continuity Correction value is 0.012, the value is smaller than 0.05 (0.012 < 0.05), so it can be concluded that there is a relationship between ISPA infection and Stunting. Meanwhile, for diarrhea infection, the Asymp. Sig. (2-sides) Continuity Correction value is 0.018, the value is smaller than 0.05 (0.018 < 0.05), so it can be concluded that there is also a relationship between diarrhea infection and Stunting.

3.1 Breastfeeding Coverage and the incidence of stunting

Stunting can occur as a result of malnutrition, especially during the first 1000 days of life (HPK). (Rezeki et al., 2021).(Rumra et al., 2021). Poor nutrition during pregnancy, infancy and early childhood can lead to stunting. (Helmyati et al., 2020). Inadequate fulfillment of nutrition both in the womb until the baby is born can cause health problems in toddlers, one of which is the birth length of the baby which describes the linear growth of the baby during the womb. (SJMJ et al., 2020). The results showed that there is a relationship between breastfeeding coverage and the incidence of stunting in toddlers in the Blega Health Center working area, Bangkalan Regency, East Java. Our findings reveal a significant relationship between exclusive breastfeeding and stunting incidence in toddlers. Toddlers who were not exclusively breastfed had a 0.2 times higher risk of stunting compared to those who received exclusive breastfeeding. This is in line with research (Dewi & Ariani, 2022) which states that there is a significant relationship between exclusive breastfeeding and the incidence of stunting in toddlers in the Working Area of UPTD Puskesmas Gianyar. So it can be concluded that exclusive breastfeeding is one of the determining factors for stunting. In addition, based on the results of data analysis, it can be concluded that toddlers who do not get exclusive breastfeeding have a risk of 0.2 times experiencing stunting compared to toddlers who get exclusive breastfeeding. This is in line with research (Asprika, 2023) which states that breastfeeding mothers who do not provide

exclusive breastfeeding have a 12,000 times greater chance of having stunted toddlers. The benefits of exclusive breastfeeding for babies include natural immunity so as to prevent babies from being attacked by disease and optimize the growth and development process in the baby's thinking ability and physical condition. (Yuliana et al., 2019). Quoted from research (AlThuneyyan et al., 2022) which states that there is a positive correlation between IQ (Intellectual Quotient) and breastfeeding behavior of mothers to toddlers. Babies who are not exclusively breastfed have a lower IQ than babies who are exclusively breastfed. This is because breast milk contains a variety of nutrients that are needed in brain growth, including taurine, lactose, DHA, AA, Omega 3 and Omega 6. (Pane et al., 2020; Yuliana et al., 2019). Strengthening breastfeeding education and support programs, particularly in rural health centers, could significantly enhance breastfeeding coverage. Policies could include mandatory breastfeeding counseling for pregnant women and postpartum mothers as part of routine antenatal and postnatal care.

3.2 Education Level with Incidence of Stunting

Mother's education is one of the factors that affect a person's nutritional status. With a high level of education, it is expected that an understanding of information on meeting nutritional needs can be applied properly so as to prevent nutritional problems. (Hatini, 2023). Based on the results of the analysis conducted on the maternal education variable and the incidence of stunting above, the results show that the Asymp. Sig. (2-sides) Continuity Correction of 0.353 the value is greater than 0.05 ($0.353 > 0.05$) or in other words it can be concluded that there is no significant relationship between maternal education and the incidence of stunting in toddlers in the Blega Health Center working area, Bangkalan Regency, East Java. This is in line with research (Rahayuwati et al., 2023) which states that maternal education and parenting practices are not determinants of stunting in children under five.

However, another analysis also concluded that toddlers with mothers who have low education levels have a 2.5 times risk of stunting compared to toddlers who have mothers with high education levels. This is corroborated by the theory of research (Hall et al., 2018) which states that parents play a major role in this prevention as the first environment closest to the child. Mother is a figure who has a big role in the family, especially in the process of child growth and development, such as nutrition fulfillment, parenting behavior, and childcare. Based on the health belief model, increasing mothers' knowledge about stunting is very important. This aims to create an accurate perception of threat that predicts behavioral changes (Juliartri & Megasari, 2021). Integrating stunting prevention education into existing community-based health initiatives, such as Posyandu programs, could address gaps in maternal knowledge. Additionally, fostering collaboration between health centers and educational institutions can enhance outreach efforts, ensuring broader access to stunting-related education.

3.3 Sanitation Hygiene with Stunting Incidence

There are direct and indirect causal factors that lead to malnutrition. Direct causes of stunting include under-five nutrition, nutritional status of pregnant women, and infectious diseases. (Azzura et al., 2021) (Novianti & Padmawati, 2020). In contrast, indirect causes include the physical quality of drinking water, drinking water sources, latrine ownership, and hygiene, particularly handwashing practices. Based on the results of data analysis, it can be

concluded that hygiene and sanitation behavior does not have a significant relationship with the incidence of stunting in families of toddlers in the working area of the Blega Health Center, Bangkalan Regency, East Java. Implementing community-wide sanitation improvement programs, including safe water access and hygiene education, remains essential. These initiatives should complement existing health interventions to create a supportive environment for child growth.

3.4 Infectious Diseases with Stunting Incidence

Other aspects that influence stunting include a child's susceptibility to infectious diseases (Wishaupt et al., 2017). Walson and Berkley concluded that there is a two-way relationship between malnutrition and infectious diseases. Infectious diseases experienced by children can reduce their health, especially if they are not balanced with good nutrient absorption. (Bening et al., 2018). The transmission of infectious diseases is highly dependent on health conditions and adequate nutritional intake. In this regard, children under the age of five are a more vulnerable age group to infectious diseases. Therefore, infectious diseases are one of the main concerns especially in developing countries. In line with this, Indonesia is also one of the countries where infectious diseases are a major health problem. (Picauly, 2023).

In this study, the infectious diseases that will be studied further are Upper Respiratory Tract Infection (URTI) and diarrhea. These two diseases were chosen as the variables to be studied because of the background of the study (Arini et al., 2020) which states that toddlers who are under 5 years old and suffer from acute diarrhea and toddlers who experience cough, runny nose, fever, and vomiting are more at risk of growth retardation assuming these symptoms continue for the next 14 days. (Garzón et al., 2018). This is corroborated by the results of the data analysis that has been carried out so that it can be concluded that the two infectious diseases have a significant relationship with the incidence of stunting in toddlers in the Blega Health Center working area, Bangkalan Regency, East Java. This is in line with previous research which states that upper respiratory tract infections in children are known to be a risk factor for stunting. (Nurdin, 2023). Other studies have also concluded that acute respiratory infections are the main factor causing underweight, but diarrhea is the main risk factor for stunting. This corroborates the theory of a significant relationship between diarrhea and respiratory infections as risk factors for stunting in children under five. (Berhe et al., 2019) (Arini et al., 2020).

4. Conclusion

This research is an applied form designed based on the results of research on the relationship between ASI Coverage, Maternal Education Level, Sanitation Hygiene, and Infectious Diseases with the Incidence of Stunting in Toddlers in Bangkalan Regency, East Java in the form of a policy brief as an exploratory media that not only provides a selected recommendation but as an advocacy media provides options for a solution to prevent and overcome the problem of stunting. This study identifies key factors influencing stunting, including breastfeeding coverage, maternal education, and infectious diseases. While sanitation hygiene did not show a direct relationship, its role as an indirect factor cannot be overlooked. These findings underscore the multifaceted nature of stunting and the need for comprehensive, context-specific strategies to address this public health challenge.

The creation of innovations aimed at policy makers or stakeholders aims to provide analysis related to risk factors that can cause stunting, such as sanitation hygiene, exclusive breastfeeding coverage, education level and the association of infectious diseases with the incidence of stunting in Bangkalan Regency, East Java, which is the purpose of this study. Therefore, this study is expected to provide information related to stunting as one of the complex problems that needs to be addressed comprehensively by all parties including policy makers and not least for the wider community, especially regarding stunting prevention efforts..

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