

ANALYSIS OF FACTORS CAUSING STUNTING AND NUTRITIONAL SOLUTIONS FOR A HEALTHY GENERATION IN NUNUKAN

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Abstract

The prevalence of stunting in Indonesia is still a serious public health problem, especially in Nunukan District. Based on data from the Indonesian Health Survey (IHS), the prevalence of stunting in Nunukan District in 2022 reached 30.5% and decreased in 2023 to 15.8%. This figure is still quite far from the national target of 14% by 2024. This study aims to analyze the factors that cause stunting and formulate nutritional solutions to create a healthy generation in Nunukan District. The research method used a quantitative approach with a systematic literature review design and secondary data analysis. Data sources were obtained from the Nunukan District Health Office for the 2020-2023 period, 2022 PSG data, Puskesmas reports, 2018 Riskesdas data, and previous research related to stunting in Nunukan. Based on these findings, solutions are recommended in the form of increased integrated nutrition education, optimization of supplementary feeding programs, strengthening exclusive breastfeeding programs, and improving environmental sanitation tailored to the characteristics of the Nunukan region.

Keywords: Nunukan, Nutritional status, Secondary data, Stunting.

INTRODUCTION

Stunting is one of the nutritional problems that remains a global challenge, especially in developing countries such as Indonesia. The World Health Organization (WHO) defines stunting as a condition of failure to thrive in children under five due to chronic malnutrition and recurrent infections, characterized by height-for-age below minus two standard deviations (<-2 SD) based on WHO standards. By 2022, there will be 149 million stunted children under five globally, with Asia accounting for 55% of the global total (WHO, 2022).

In Indonesia, although there has been a decrease in the prevalence of stunting from 24.4% in 2021 to 21.6% in 2022 (SSGI, 2023). However, this figure is still far from the WHO target of below 20%. The prevalence of stunting in Nunukan District, North Kalimantan, decreased from 30.5% in 2022 to 15.8% in 2023 (DKPPKB Nunukan, 2024). This figure is still far from the national target of 14% set by the government for 2024.

The impact of stunting not only affects children's physical growth, but also impacts cognitive development, learning achievement, and productivity in adulthood. Research shows that stunted children have a higher risk of cognitive decline, which can reduce learning achievement by 5-10 IQ points (Unicef, 2021). In addition, stunting is also associated with an increased risk of non-communicable diseases in adulthood and reduced productivity that can reach 10-17% of lifetime earnings (World Bank, 2022).

The Nunukan District Government has implemented various stunting intervention programs such as supplementary feeding, nutrition education, and improved environmental sanitation. However, the implementation of these programs has not shown optimal results, as seen from the

high prevalence of stunting. This indicates that there is a gap between the programs implemented and the factors that cause stunting according to the characteristics of the Nunukan region.

Several previous studies have identified various factors that cause stunting, such as Rahmawati's (2020) study which found an association between maternal education and economic status with the incidence of stunting in Kalimantan. Meanwhile, Supriyanto (2021) revealed the importance of parenting and environmental sanitation in stunting prevention. However, there is no comprehensive study that analyzes the factors that cause stunting and formulates effective solutions according to the characteristics of the Nunukan region.

Based on this background, this study aims to analyze the factors that cause stunting and formulate effective nutritional solutions to create a healthy generation in Nunukan District. This research can serve as a basis for the development of more targeted and impactful stunting prevention policies and programs, and help create a healthy, smart, and productive generation in Nunukan District.

LITERATURE REVIEW

2.1 Definition Stunting

Stunting is a disorder of child growth and development due to chronic malnutrition and repeated infections, characterized by length or height below the standard according to WHO (WHO, 2015). Furthermore, according to WHO (2020) stunting is short or very short based on length / height for age which is less than -2 standard deviations (SD) on the WHO growth curve which occurs due to irreversible conditions due to inadequate nutritional intake and / or repeated / chronic infections that occur within 1000 HPK. Various experts according to Wanabi et al, in Sandra Fikawati et al (2017) state that stunting is the impact of various factors such as low birth weight, inappropriate stimulation and childcare, lack of nutritional intake and repeated infections and various other environmental factors. Stunting is not only related to physical problems but can also affect children's cognitive development and learning abilities. The impact of stunting on children is not only limited to stunted physical growth, but also leads to decreased brain function that can affect the child's motor, intellectual and emotional abilities later in life (Lewit, 1997; Unicef, 2013). According to Kusharisupeni (2002), stunting has a long-term impact on children's quality of life, which is also related to the competitiveness and economic productivity of a country.

2.2 Impact of Stunting on Children's Quality of Life

- a. The long-term impacts of stunting are diverse, and cover various aspects of a child's life. Physically, stunted children grow more slowly, have lower muscle mass, and are often more susceptible to disease. Cognitively, stunting can lead to decreased intellectual ability, which in turn affects children's learning ability and academic performance at school (Grantham-McGregor, 2007).
- b. In addition, stunting risks exacerbating social and economic inequality in the future. Stunted children tend to have lower productivity and weaker competitiveness in the workforce. Thus, stunting is not only a health issue, but also a challenge to a country's economic and social development (Hoddinott, 2013).

2.3 Factors Causing Stunting

The problem of stunting is influenced by several interrelated and multifactorial factors.

- a. **Nutritional Deficiencies in Pregnant Women and Children** An unbalanced diet: both in pregnant women and children, is the main factor causing stunting. In pregnant women, nutritional deficiencies can affect fetal growth, as well as increase the risk of low birth weight (LBW) babies, who are at high risk of stunting (Ministry of Health, 2018). In children, a lack of nutrients such as protein, energy, and essential micronutrients (such as iron, vitamin A, and zinc) will hinder their physical growth and brain development (UNICEF, 2013).
- b. **Poor Sanitation and Environmental Health Conditions:** Poor sanitation factors, such as limited access to clean water and proper sanitation facilities, increase the risk of gastrointestinal infections, which interfere with the body's absorption of nutrients. Frequent infections, such as diarrhea and worms, can cause the body to lose many essential nutrients needed for growth (Kusharisupeni, 2002). In areas with limited access to clean water and sanitation facilities, such as in some parts of Kabupaten Nunukan, this problem becomes more complex.
- c. **Limited Access to Quality Health Services:** Limited access to health services, especially in rural and remote areas, is one of the main causes of high stunting rates in some parts of Indonesia. Adequate health services are essential for monitoring children's nutritional status, immunization, treatment of infectious diseases, and counseling on healthy eating (World Bank, 2018). Limited health facilities and medical personnel in certain areas, such as in Nunukan District, are an obstacle in stunting prevention efforts.
- d. **Socioeconomic and Educational Factors:** Poverty and low levels of education in the community, especially mothers, play a major role in the stunting problem. Limited knowledge about balanced nutrition and the importance of providing nutritious food to children is often associated with low education levels. People with low socio-economic levels also have difficulty accessing nutritious food, putting their children at higher risk of stunting (Smith & Haddad, 2000).
- e. **Ignorance of Healthy Feeding Practices:** Another factor influencing the prevalence of stunting is the lack of understanding of the importance of exclusive breastfeeding for the first six months of life and the selection of nutritious complementary foods. In many areas, especially those with limited access to health information, poor child feeding habits are often a major contributing factor to malnutrition and stunting (Dewey & Begum, 2011).

2.4 Nutrition Solutions to Address Stunting in Nunukan District

To address the problem of stunting in Nunukan District, a comprehensive and nutrition-based approach is needed. Some of the solution measures that can be implemented to reduce the prevalence of stunting include:

- a. **Increased Access to Nutritious Food:** One of the main solutions to stunting is to ensure that pregnant women and children receive adequate nutritious food. Extension programs on balanced nutrition, including the importance of exclusive breastfeeding and the selection of nutritious complementary foods, should be implemented on a massive scale in all communities. Providing nutritious supplementary food to toddlers and pregnant women is also necessary to prevent micronutrient deficiencies.
- b. **Improved Access to Sanitation and Environmental Health:** Improved access to clean water and adequate sanitation facilities can reduce the risk of infections that worsen children's

nutritional status. Improved sanitation and clean water distribution programs in vulnerable areas, such as in Nunukan District, are particularly important. In addition, strengthening immunization and treatment of infectious diseases at the puskesmas level can also support stunting prevention efforts.

- c. Community Empowerment Through Nutrition Education: Intensive nutrition counseling, especially for pregnant women and mothers of children under five, can increase knowledge about the importance of healthy and nutritious feeding. In addition, empowering communities to care more about children's health will also support stunting prevention efforts (WFP, 2017). Counseling on the importance of a balanced diet and healthy living habits can improve community awareness of nutrition issues.
- d. Improved Health Services: Improving the quality and accessibility of health services in remote areas is critical. Regular monitoring of children's nutritional status, examination of pregnant women, and treatment of diseases that interfere with the growth process, such as diarrhea or worm infections, can significantly reduce stunting rates.

RESEARCH METHOD

Research Approach:

This research used a quantitative approach with a systematic literature review (SLR) design and secondary data analysis. This approach allows for the collection, analysis and evaluation of existing data related to stunting in Nunukan District with reference to relevant data sources for the 2020-2023 period.

Research Design

This research design combines two main methods:

1. Systematic Literature Review (SLR): Reviewing and analyzing previous research findings on stunting in Nunukan Regency or its surroundings. SLR was conducted by searching relevant literature in journals, research reports and other publications on the topic of stunting, its causes, impacts and interventions.
2. Secondary Data Analysis: Analyzed existing data on the prevalence of stunting and the factors that influence stunting in Nunukan District. The secondary data used includes various sources available at the Nunukan Health Office and Puskesmas, as well as the results of related surveys.

Data Sources

The data used in this study came from various sources related to stunting in Nunukan Regency, including:

1. Nunukan District Health Office (2020-2023): Data that includes information on public health conditions, nutrition programs, and the health status of mothers and children in Nunukan District for the period 2020 to 2023.
2. Nutrition Status Profile (2022): Data related to the prevalence of malnutrition and the nutritional status of children in Nunukan District in 2022 that provides more detailed information on nutrition issues in the area.

3. Puskesmas Report: Routine reports from Puskesmas that include information on the number of stunting cases, malnutrition prevention programs, and evaluation of programs implemented at the Puskesmas level.
4. Riskesdas 2018: Data from the 2018 Basic Health Research (Riskesdas) that provides an overview of the social, economic, and health factors that influence nutritional status and the incidence of stunting in Indonesia, including in Nunukan District.
5. Previous Research: Previous studies related to stunting in Kabupaten Nunukan or areas with similar characteristics, which provide further insight into the causal factors and interventions.

Data Collection Procedures

1. Literature Data Collection: Searches are carried out in academic databases such as Google Scholar, PubMed, and related journals that publish research on stunting. The selected literature must be relevant to the topic, related to the geography of Nunukan or a region that has similar characteristics, and be published within the last 5 years.
2. Secondary Data Collection: Data from the Nunukan Regency Health Office, Puskesmas reports, 2022 PSG Data, and 2018 Riskesdas are collected through applications to relevant agencies. The data collected will be analyzed to identify the prevalence, patterns, and factors that affect stunting in the region.
3. Data Validation: The data obtained will be compared with the relevant literature to ensure its consistency and validity.

Data Analysis Techniques

1. Descriptive Analysis: Using descriptive statistics to describe the prevalence of stunting in Nunukan Regency based on data obtained from the Health Office, PSG 2022, Puskesmas, Riskesdas 2018, and previous research.
2. Correlation Analysis: Analyze the relationship between socioeconomic factors, access to health services, nutritional patterns, and environmental factors with the incidence of stunting in Nunukan Regency.
3. Synthesis of SLR Findings: The results of the SLR will be used to formulate conclusions related to the factors that cause stunting in Nunukan, as well as potential interventions that can be carried out to reduce the prevalence of stunting.

RESULTS AND DISCUSSION

Based on the analysis of secondary data collected from various sources, as well as findings from the Systematic Literature Review (SLR), the results of this study provide an overview of the prevalence and factors causing stunting in Nunukan Regency in the 2020-2023 period.

Prevalence of Stunting in Nunukan Regency

Data from the Nunukan Regency Health Office (2020-2023) shows that the prevalence of stunting in Nunukan Regency over the past three years has fluctuated, but it still shows a fairly high figure. In 2020, the prevalence of stunting was recorded at around 30%, while in 2022, the prevalence increased to 32%. This data reflects that despite the efforts of the government and health centers, the problem of stunting is still a major challenge in this region. Based on the 2022 PSG

data, which focuses on the nutritional status of children, it is recorded that 25% of children in Nunukan Regency are stunted, with a higher prevalence in rural and border areas.

1. Factors Causing Stunting

Socioeconomic Factors: The results of the analysis show that socioeconomic factors, including poverty and lack of education about nutrition, play a significant role in causing stunting. Riskesdas 2018 data reveals that people in border areas such as Nunukan often have limited access to resources, be it education, health services, or nutritious food.

Access to Health Services: Based on reports from Puskesmas obtained during the 2020-2023 period, limited access to health services in remote areas is one of the factors contributing to stunting. Some areas far from major health facilities often struggle to get routine check-ups and adequate nutrition services.

Community Nutrition Patterns: The results of the SLR show that an unbalanced diet, as well as low consumption of nutritious foods, contributes greatly to the problem of malnutrition in Nunukan. Many families in the area depend on limited local foods, such as rice and fish, which do not cover all of the children's nutritional needs.

Environmental and Sanitation Factors: The results show that poor sanitation and lack of access to clean water are major problems in several areas in Nunukan. This condition causes recurrent infections in children that affect their nutrient absorption and growth.

2. Countermeasures and Intervention Efforts

Government Programs: In a report from the Nunukan Health Office, it is known that since 2020 the government has implemented nutrition intervention programs, such as supplementary feeding and immunization, to reduce stunting rates. However, the achievement of this program is constrained by budget limitations and uneven distribution, especially in rural areas.

Puskesmas Program: Puskesmas in several regions have made efforts to educate pregnant women and their families regarding healthy diets and the importance of good nutrition for children's growth and development. However, low public awareness of the importance of balanced nutrition requires a more intensive and sustainable approach.

Reduction of Stunting Rate: Based on the evaluation of the program, although there are efforts to improve the nutritional status of children, their effectiveness is still limited due to structural and social barriers. Therefore, closer collaboration is needed between local governments, health centers, and the community to ensure the success of the intervention.

DISCUSSION

1. High Prevalence of Stunting in Nunukan Regency

Although there are several government programs that aim to reduce the prevalence of stunting, the number recorded remains high. This shows that the factors causing stunting in Nunukan are complex and require a holistic approach. Socioeconomic factors, access to health services, poor diets, and inadequate sanitation are key elements that must be improved simultaneously.

2. Socio-Economic Factors That Play an Important Role

From the results of the research, it is clear that the problem of stunting in Nunukan is not only related to nutritional status, but also to the problem of poverty that plagues most of the community. Limited resources, low income, and lack of education about the importance of nutrition and healthy

eating make it difficult for families to provide nutritious food for their children. In border areas, this factor is further exacerbated by limited access to health facilities and information.

3. Limited Access to Healthcare

Limited access to health facilities in remote areas has a great impact on stunting prevention and control. Although Puskesmas try to provide basic services to the community, long distances and inadequate infrastructure hinder the delivery of nutritional assistance or optimal health services. Therefore, there is a need for a strategy to strengthen the health service network that is closer and more accessible to the community.

4. Diet and Nutritional Limitations

An unbalanced diet, which often relies on carbohydrates (such as rice) and a lack of variety of nutritious foods, is the main factor causing stunting in Nunukan Regency. Education programs on the importance of eating nutritious food must be carried out with a more intensive approach and based on local wisdom, so that the community can more easily understand and implement these suggestions.

5. The Need for Collaboration and an Integrated Approach

To overcome the stunting problem in Nunukan Regency, collaboration between various parties is very important, including the local government, health centers, civil society organizations, and the community itself. In addition, interventions that focus more on structural stunting factors such as poverty, sanitation, and nutrition education should be a priority in stunting prevention programs.

CONCLUSION

The conclusion of this study is that the prevalence of stunting in Nunukan Regency is still relatively high, although there is a significant decrease from 30.5% in 2022 to 15.8% in 2023. The factors that cause stunting in this region are complex and multifactorial, including malnutrition in pregnant women and children, poor sanitation and environmental health conditions, limited access to health services, and low socioeconomic and educational factors.

To overcome the problem of stunting, solutions are recommended that include increasing integrated nutrition education, optimizing supplementary feeding programs, strengthening exclusive breastfeeding programs, and improving environmental sanitation. Collaboration between the government, health centers, and the community is very important to ensure the success of the intervention and create a healthy generation in Nunukan Regency. This research is expected to be the basis for the development of more effective and impactful stunting control policies and programs.

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