

# Reducing Stunting Prevalence: Causes, Impacts, and Strategies

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**Abstract.** The prevalence of stunting in Indonesia was still high at 24.4% based on the 2021 Indonesian Nutritional Status Study, while at 20.9% in Central Java. Policymakers need to make quick and practical decisions to support the creation of an environment that empowers communities in stunting prevention. This current study aimed to describe the cause and effect of stunting and various applicable models of community empowerment in various regions of Indonesia to prevent stunting cases. This study used a qualitative method and focus group discussions (FDG) for data collection. It was conducted in mid-2022. The participants were the technical officers of the provincial government, National Population and Family Planning Board (BKKBN), non-government organizations, nutritionists, child health experts and academicians, as many as 2 participants from each organization selected by the purposive sampling method. The FGD results showed several good practices in some regions. One initiative to replicate is providing stunting prevention training for cadres and mothers of childbearing age and health promotion programs for prospective brides at least three months before marriage. Besides, forming a team for collecting data on prospective brides, and improving the existing recording system is required to reduce stunting prevalence.

## 1 Introduction

Stunting is one of the health problems in Indonesia which was globally ranked fifth highest stunting prevalence in children under five years old. In Indonesia, stunting is a chronic nutritional problem in which the child's height does not match with age. The 2021 Indonesian Nutritional Status Study showed a 24.4 % of stunting prevalence in Indonesia [1] which was less serious compared to The 2018 Basic Health Research. However, the situation is still concerning as one in three children under five in Indonesia suffers from stunting. Accelerating stunting reduction measures is a priority target for the Indonesian Government

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which determined the prevalence to be reduced up to 14% by 2024. The stunting prevalence in Central Java (20.9%) which was ranked the 7<sup>th</sup> province with the lowest prevalence was lower than the national prevalence but this value is still far from the national target.

Stunting is influenced by many factors, including socioeconomics, food intake, infection, mother's nutritional status, infectious diseases, micronutrient deficiencies, the environment and physical metabolic disorders. Based on the data, some determinants of stunting that need to be considered in Central Java are LBW, exclusive breastfeeding in children aged 0-5 months, and various foods in children aged 0-23 months. Those indicators show a worse figure than the national level. Based on the 2021 Indonesian Nutritional Status Study, the prevalence of LBW in Central Java was 6.9% higher than the national (6.6%). Only 47.5% of children aged 0-5 months who receive exclusive breastfeeding and 38.8% of children aged 0-23 months who are fed with diverse food, lower than the national (52.5%) [1]. In a long-term period, it may lead to decreased cognitive abilities, lowered learning achievement, and decreased immunity, thereby posing a high risk of developing diabetes, heart disease, cancer, stroke, and other disabilities in old age [2]. To prevent these devastating effects, stunting could be controlled by giving attention to the first 1,000 days of fetal life.

Stunting becomes the priority health problem to solve, and thus the President launched the National Strategy for the Acceleration of Stunting Reduction in Indonesia. This program requires collaboration from various actors such as the government, private sector, academia, society, philanthropy, and mass media [3].

Specific and sensitive nutrition interventions directly and indirectly dealing with the causes of stunting should be supported by a comprehensive political and policy commitment to implementation, government and cross-sectoral involvement, and capacity building for health workers. Several interventions have been carried out by the Central Java government, such as education for teenagers to prevent early marriage, pre-marriage course, maternal class, supplementary feeding for pregnant women and toddlers, and increasing family food security. In practice, intervention activities have not been effective and cannot be measured properly. Equalizing perceptions and division of tasks across all OPDs is also a challenge besides the need to improve the database to improve program performance. Success in the implementation of the stunting prevention program will be beneficial to protect all children under five years old in Central Java. Based on the descriptions above, this paper addressed various causes and impacts of stunting, as well as different prevention measures.

## **2 Research method**

This study used a qualitative method and focus group discussions (FDG) for data collection. The FGD was held three times on the topics of stunting in Indonesia especially in Central Java and the direct and indirect causes of stunting. This study was part of study entitled "Family Nutrition Attachment (FNA) toward Enhancement of Nutrition Status of Under 5-years Stunting Children". This study has ethical clearance approval No. 400/EC/KEPK/FK-UNDIP/X/2021 from Faculty of Medicine – Diponegoro University, Indonesia.

The participants were the technical officers of the Central Java Provincial Government National Population and Family Planning Board (BKKBN), and non-government organizations, nutritionists, child health experts and academicians, as many as 1-2 participants from each organization selected by the purposive sampling method, in total it was 19 participants.

### 3 Results and discussion

This section describes the analysis of three FGDs. The first FGD focused on discussing various contributing factors followed by past accelerating measures in the second session and evaluation and strategies for accelerating reductions in the third session. Participants in the FGDs were representatives of regional apparatus organizations in Central Java, non-governmental organizations related to family planning and health, professional organizations, religious organizations, and university. The representatives of regional apparatus organizations came from the Provincial Health Office, Education Office, Food Security Office, Ministry of Religion, Provincial Planning Agency, Women and Child Protection Service, Stunting Task Force, Central Java PKK, Fatayat NU, Aisyah, PERSAGI, IBI, Fapsedu, Population Coalition, PKBI, IPKB, and UNICEF Indonesia.

#### 3.1 Causes of stunting

Stunting is a failure to thrive due to chronic malnutrition in children under five years old (toddlers) especially in the first 1,000 days of life (HPK) [4]. Various studies have found that the causes of stunting are multi-dimensional. The causes could be both direct and indirect, and some of them may be related to medical and social factors. To identify the causes, it is important to trace the nutrition status throughout adolescence, pre-conception (bride-to-be), pregnancy, and childhood.

Adolescence and pre marriage are the beginning to raise awareness of nutritional issues. Adolescence is a period of rapid growth and development that requires a high intake of nutrients. Excessive nutrition and undernutrition during this period have implications for adolescents and the next generations, especially young women. Stunting is closely related to pregnancy, especially maternal and child health. In adolescents aged 16-18 years, the prevalence of underweight and obesity was 9.4% and 7.3%, respectively [2]. In Central Java, female adolescents aged 12-18 years were known to develop 0.4% of very poor nutritional status, 2.7% of undernutrition status, 73.4% of normal nutritional status, 17.5% of overweight status, and 5.9% of obesity (PSG, 2017).

Anemia during pregnancy is one of the causes of maternal death or also known as "Potential Danger To Mother And Child" and is a cause of chronic debilitation that will have an impact on social, economic, and physical health [5]. Based on the 2018 Basic Health Research Data in Central Java, the incidence of anemia in pregnant women is 43.5%. Iron deficiency anemia (ADB) that occurs during pregnancy is associated with an increased risk of prematurity, low birth weight (LBW), and low iron stores in newborns. These impaired growths and development in the womb and outside after several months of birth are caused by inadequate iron intake from the mother to the fetus, thus interfering with metabolism, bone growth, erythropoiesis, and the formation of fetal immune cells.

Furthermore, infancy before the age of 2 years is the critical period for improving nutritious intake for the infant. Exclusive breastfeeding for infants up to the age of 6 months is shown to reduce the incidence of infant mortality and morbidity and the impairment of weight and height growth. Ill children could develop stunting despite the nutrition intake because the nutrients consumed are mainly used for the healing process but not for growth [6]–[12]. Supporting the statements, previous research in Central Java showed that children aged 6-24 months who were not exclusively breastfed had a 1,282 times risk of stunting. In conclusion a history of exclusive breastfeeding was a factor associated with stunting [13].

Complementary foods for infants >6 months can increase the child's immune system against various diseases [14]. Feeding too early (< 6 months) can trigger immune reactions or allergies because the cells around the intestines are still not ready to accept complex food nutrients [15]. The food provided must be able to meet nutritional needs so as not to interfere

with growth and cause stunting [16]. One of the nutrients that are low in complementary foods is protein. A systematic review of the habits of complementary feeding in South Asia found that only 17.1% of infants were given complementary foods containing protein sources of meat, fish, poultry, and/or eggs [17]. Low protein intake is positively related to the incidence of stunting [18].

According to the FGD, participants indicated that lack of knowledge about stunting, poor parenting, exclusive breastfeeding, and micronutrient deficiencies were the determinants of stunting in Central Java.

### **3.2 Long-term impacts of stunting**

Stunting impacts the quality of human resources, and it contributes to 2-3% of Gross Domestic Product (GDP) loss every year [3]. Besides, it affects the development and growth of organs, and it contributes to 15% of toddler deaths in the world and the loss of a healthy life span for 55 million children under five years old [2]. In a short-term period stunting may cause delays in cognitive development and low learning performance. Cognitive abilities are highly dependent on the environment, parents' support, and nutritional status during infancy [19]. Several studies conducted in Central Java also showed the same thing. Study on toddlers aged 2-3 years in Semarang district shows that stunting toddlers are at greater risk for experiencing less cognitive development than toddlers who were not stunted (OR: 4,303) [20]. Other study conducted on junior high school students in Sukoharjo also showed the same results, where stunting adolescents were at greater risk of having poor cognitive abilities compared to adolescents who were not stunted (OR: 18,333) [21].

Long-term impacts of stunting may be poor productivity, low wages, and, an increased risk of obesity and other non-communicable diseases [17], [22]. The risk of obesity due to stunting is related to lower resting energy expenditure. Stunting children have higher respiration quotient and carbohydrate oxidation, but lower fat oxidation than non-stunted children [23]

### **3.3 Community Empowerment for Stunting Reduction**

A comprehensive approach, which harmonizes political and policy commitment, government and cross-sectoral involvement, and human resource competence, is required to accelerate the stunting prevention measures in Central Java. Based on this approach and several challenges faced in implementing interventions such as the ineffectiveness of educational activities, the need for counseling/assistance programs by cadres, and the limited availability of data that supports stunting reduction interventions, this current study formulated the following recommendations: (a) Stakeholders need to conduct training on stunting prevention for cadres and mothers of children under five years old. The training must convey information related to the definition, impact, causes, prevention, and early detection of stunting; (b) Accelerating strategies need to be done by fulfilling the nutritional needs of pregnant women; (c) Stakeholders need to conduct a pre-marriage course accompanied by a facilitator for prospective brides at least three months before marriage; (d) Village needs to form a family-assistance team responsible for distributing supplements such as blood tablets to pregnant women and collecting data on prospective brides; (e) Stakeholders have to collect data on stunting prevention strategies through various sources to improve their programs.

## 4 Conclusion

The prevalence of stunting in Central Java (20.9%) was lower than the national prevalence. Stunting detection has to be carried out throughout adolescence, pre-conception, pregnancy, and post-delivery for up to two years. Strong and systemic multi-sectoral collaboration is required to reduce stunting quickly and effectively.

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## Declaration of Conflict of Interests

The authors declared no potential conflicts of interest for the research, authorship, and/or publication of this article.

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