

Stunting and its Risk Factors at Durenan Primary Public Healthcare in 2025

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Abstract

Stunting remains a major global health concern, particularly in low- and middle-income countries. Indonesia has successfully reduced its stunting prevalence over the past five years, reaching 19.8% in 2024. Stunting is caused by multiple direct and indirect factors, and nutritional deficiencies during the first 1,000 days of life, particularly the period from conception to two years of age, can have irreversible impacts on children's growth and long-term quality of life. This study aimed to identify and analyze the risk factors associated with stunting among children in the working area of Durenan Primary Public Healthcare, Trenggalek Regency, and to provide baseline data on the prevalence of stunting in the region. This qualitative descriptive study used secondary data from 58 children with stunting aged 8–59 months in 2025, based on height-for-age <-2 standard deviations (SD) according to World Health Organization (WHO) standards. The study analyzed several risk factors, including maternal chronic energy deficiency, low household income, low birth weight, comorbidities, non-exclusive breastfeeding, exposure to cigarette smoke, and inadequate nutritional intake. Children without stunting were excluded from the analysis. Among the 58 children included in the study, 14 (24.13%) were born to mothers with chronic energy deficiency, 30 (51.72%) came from families with economic difficulties, 9 (15.51%) had low birth weight, 9 (15.51%) had comorbidities, 12 (20.68%) did not receive exclusive breastfeeding, 47 (81.03%) were exposed to cigarette smoke at home, and all children (100%) had inadequate nutritional intake. Stunting remains a significant public health challenge in Indonesia, particularly in rural areas. Prevention efforts should begin during preconception and continue throughout pregnancy and early childhood. Collaboration among healthcare professionals, healthcare facilities, and relevant sectors is essential to accelerate stunting reduction efforts and support the achievement of zero stunting in Indonesia.

INTRODUCTION

Stunting is defined as a condition of short or very short stature based on length/height-for-age measurements below -2 standard deviations (SD) according to the World Health Organization (WHO) growth standards (Kementerian Kesehatan Republik Indonesia, 2022). Stunting is a chronic nutritional problem caused by inadequate nutritional intake over an extended period due to feeding practices that do not meet children's nutritional requirements. Stunting may begin during the fetal period and becomes more apparent when children reach two years of age (Investigators, 2017; Millward, 2017). It is assessed as a nutritional status indicator based on a child's length or height, age, and sex (Eze et al., 2017; Ferreira, 2020).

In 2024, approximately 150.2 million children under five years of age worldwide were affected by stunting, 42.8 million experienced wasting, and 35.5 million were overweight for their height. Southeast Asia demonstrates considerable diversity across economic, cultural, social, geographical, and demographic aspects. Countries in the region also differ in access to education, healthcare services, sanitation, and adequate nutrition (Chakravarty et al., 2017). Despite these differences, most Southeast Asian countries are classified as developing countries, except Singapore. These conditions contribute to persistent poverty and economic inequality, which may increase the risk of childhood stunting due to limited access to nutritious food and adequate health services. Southeast Asia consists of 11 countries, seven of which have stunting prevalence rates above the global average. The highest prevalence was reported in Timor-Leste (48.8%), followed by Indonesia (31.8%), Laos (30.2%), Cambodia (29.9%), the Philippines (28.7%), Myanmar (25.2%), and Vietnam (22.3%) (Beyond Personal Factors, 2021).

According to the Indonesian Nutrition Status Survey (Survei Status Gizi Indonesia [SSGI]), the prevalence of stunting in Indonesia decreased to 19.8% in 2024 from 21.5% in 2023. In East Java Province, the prevalence also declined to 14.7% in 2024 from 17.7% in 2023, making East Java the province with the largest reduction in stunting prevalence on Java Island (Kementerian Kesehatan RI, 2024). In Trenggalek Regency, the prevalence of stunting was 6.7% in 2024, indicating that stunting remains a public health concern despite the relatively lower prevalence compared with national and provincial levels.

Although numerous studies have examined stunting risk factors in Indonesia, several research gaps remain (Beal et al., 2018). First, most studies have focused on urban or peri-urban areas, whereas research in rural settings such as Durenan District, Trenggalek Regency, remains limited. Second, previous studies have frequently examined risk factors individually rather than comprehensively analyzing interactions among multiple risk factors within the same population. Third, limited research has simultaneously investigated the full range of factors from maternal health conditions during pregnancy to postnatal environmental factors. Fourth, the high prevalence of cigarette smoke exposure (81.03%) and inadequate nutritional intake (100%) identified in rural populations requires further investigation because these factors remain insufficiently explored in previous studies.

The novelty of this research lies in its comprehensive analysis of multiple risk factors associated with stunting in a rural Indonesian setting, specifically within the working area of Durenan Primary Public Healthcare. Unlike previous studies that examined risk factors separately, this study simultaneously analyzes seven key factors: maternal chronic energy deficiency, low family income, low birth weight, comorbidities, non-exclusive breastfeeding, cigarette smoke exposure, and inadequate nutritional intake. This approach provides a more comprehensive understanding of how multiple factors contribute to stunting in rural communities. Furthermore, this study provides baseline information regarding stunting prevalence in Trenggalek Regency, contributing to the limited evidence on stunting conditions in rural areas of East Java.

According to the WHO conceptual framework, stunting results from interactions among multiple factors, including inadequate nutritional intake and increased nutritional requirements. Inadequate intake may be influenced by socioeconomic conditions, poverty, limited parental education and knowledge regarding infant and young child feeding practices, inadequate

breastfeeding and complementary feeding practices, cultural factors, neglect, and limited availability of nutritious local food sources. Increased nutritional requirements may occur due to chronic diseases requiring Food for Special Medical Purposes (FSMP), such as congenital heart disease, cow's milk allergy, very low birth weight, inborn errors of metabolism, chronic infections caused by poor personal and environmental hygiene, and vaccine-preventable diseases such as tuberculosis, diphtheria, pertussis, and measles. Failure to regularly measure children's length or height in communities contributes to delayed detection of stunting. Malnutrition affects children's nutritional status in both the short and long term, with stunting representing one of the consequences of prolonged nutritional deficiency.

Children with stunting are at increased risk of morbidity and mortality, impaired immune function, and infectious diseases. Stunted children have been reported to have an average intelligence quotient (IQ) score approximately 11 points lower than children with normal growth patterns. Growth and developmental impairments caused by malnutrition, if not addressed early, may persist into adulthood. Long-term consequences include failure to achieve optimal cognitive and physical potential, which may negatively affect future work capacity and socioeconomic status. In addition, stunted children may experience altered metabolism, including reduced fat oxidation, increased central fat accumulation, and insulin resistance, leading to a higher risk of noncommunicable diseases such as diabetes, hypertension, dyslipidemia, and reproductive health problems in adulthood.

Prevention plays an essential role in reducing the incidence of stunting. Stunting prevention can be implemented through primary, secondary, and tertiary prevention strategies. Primary prevention begins at the community health volunteer (kader) level through integrated health service posts (posyandu). Community health volunteers monitor child growth, measure length/height and weight using standardized equipment and procedures, and provide education to parents or caregivers regarding exclusive breastfeeding and complementary feeding with adequate nutritional content, particularly animal-source protein. During posyandu activities, supplementary feeding programs (Pemberian Makanan Tambahan [PMT]) containing animal protein sources such as eggs, chicken, fish, meat, milk, and dairy products may be provided. Children identified with length/height-for-age below -2 SD, weight-for-age below -2 SD, weight faltering, or growth deceleration should be referred to a first-level healthcare facility (Fasilitas Kesehatan Tingkat Pertama [FKTP]) or public health center (puskesmas). Monthly growth monitoring through weight and length/height measurements is required for early detection of growth problems.

Secondary prevention is conducted by physicians at first-level healthcare facilities. Physicians confirm previous anthropometric measurements and assess potential causes of growth impairment. Children with low weight, weight faltering, or undernutrition who have not yet developed short stature may receive nutritional interventions, including specialized dietary products when clinically indicated, to prevent progression to stunting. Nutritional management should be prescribed and monitored by healthcare professionals. Physicians and nutrition officers at puskesmas continue providing counseling and education to parents or caregivers regarding child growth assessment results, appropriate feeding practices, food preparation, and implementation of responsive feeding principles. Tertiary prevention is conducted by pediatric specialists at referral hospitals (Fasilitas Kesehatan Rujukan Tingkat

Lanjut [FKRTL]) through confirmation of diagnosis and management of children with stunting.

Based on the background described above, the research problem formulated in this study was: What risk factors contributed to the occurrence of stunting among children in rural areas of Durenan District, Trenggalek Regency, in 2025? This study aimed to identify risk factors associated with stunting among children in the working area of Durenan Primary Public Healthcare, Trenggalek Regency, and to provide baseline information regarding stunting prevalence in the area. This research provides theoretical and practical contributions. Theoretically, it contributes to the understanding of stunting risk factors in rural Indonesian settings by examining the interaction of multiple contributing factors and expanding the limited literature on stunting in rural East Java. Practically, this study provides valuable information for healthcare providers and policymakers in developing targeted stunting prevention interventions, serves as baseline data for monitoring stunting prevalence in Trenggalek Regency, supports community health workers in identifying children at risk, and provides a reference for future research involving broader geographical areas and additional variables.

METHOD

The research used a qualitative descriptive method based on secondary data observation. The data covered the period from January to December 2025. The inclusion criteria comprised infants or children aged 6–59 months with length/height-for-age measurements below -2 SD according to the WHO growth standard who had chronic nutritional problems identified during pregnancy or after birth and were receiving nutritional interventions. The exclusion criteria included infants or children aged 6–59 months with length/height-for-age measurements above -2 SD and those without chronic nutritional problems.

Infants were weighed using a digital baby scale, whereas children were weighed using a digital standing scale. Length was measured for children under 2 years of age using a recumbent length board, while height was measured for children over 2 years of age using a stadiometer. Risk factors were identified based on maternal pregnancy history, child birth history, interviews, and home visits conducted by healthcare staff.

RESULTS AND DISCUSSION

Based on secondary data obtained, there were 58 children aged 8 – 59 months who experienced stunting in the period January – December 2025.

The results of the data analysis in this study can be seen in the following table:

Table 1. Risk Factors for Stunting

NO.	Risk Factors	Amount	Percentage
1.	History of chronic energy deficiency in the mother during pregnancy	14	24.13%
2.	Economically challenged families	30	51.72%
3.	Low birth weight	9	15.51%
4.	Comorbidities	9	15.51%
5.	Not exclusive breastfeeding	12	20.68%
6.	Exposure to cigarette smoke	47	81.03%
7.	Inadequate nutrition	58	100%

Source: Secondary Data from Durenan Primary Public Healthcare Nutritional Status
Surveillance Records, 2025

Based on table 1, it was found that stunted children with a history of chronic energy deficiency in mothers during pregnancy were 14 children (24.13%), risk due to families with difficult economic conditions were 30 children (51.72%), history of low birth weight (LBW) were 9 children (15.51%), accompanied by comorbidities were 9 children (15.51%), did not receive exclusive breastfeeding were 12 children (20.68%), exposed to cigarette smoke were 47 children (81.03%), and inadequate nutrition were 58 children (100%).

The risk factors for stunting do not only occur after the baby is born, but can occur while the baby is still in the womb. The mother's maternal history greatly influences the risk of stunting in children, such as the risk of poor nutrition during pre-conception and pregnancy. The nutritional status of pregnant women can affect the health and development of the fetus. Impaired growth in the mother's womb during pregnancy greatly influences the birth of a child who is malnourished or stunted. The condition of poor nutritional status at the beginning of pregnancy and the risk of CED (Chronic Energy Deficiency) during pregnancy, followed by less weight gain during pregnancy can cause pregnant women to increase the risk of miscarriage, stillbirth, neonatal death, congenital defects, anemia in babies, and babies born with LBW. the fetus or baby will take supplies from the mother's body, such as maternal fat cells as a source of calories; iron from stores in the mother's body as a source of iron for the fetus/baby (Nubli & Sutarto, 2023).

Apart from that, risk factors that can occur in the home environment include exposure to cigarette smoke and also the family's economic conditions (Lu et al., 2018). High smoking prevalence rates can contribute to the increase in stunting prevalence. This is because cigarettes or other tobacco products can be a large household expense among low-income families. Smoking exacerbates the impact of poverty, as spending on tobacco can divert household income from food, clothing, housing, health and education. The amount of money spent on tobacco is particularly problematic in low-income countries (Muchlis et al., 2023).

The risk factor for not getting exclusive breast milk is because breast milk contains a number of unsaturated fatty acids which are important for the growth and development of a child's brain. Breastfeeding has a positive impact on children's growth and development (Azizah et al., 2022).

Inadequate nutrition during MPASI and after MPASI also plays an important role in the risk of stunting. The quantity and nutritional quality of dietary protein is known to influence plasma levels of insulin-like growth factor I, a mediator of growth hormone—as well as bone matrix proteins and growth factors that play an important role in bone formation (Mahfouz et al., 2021).

Meanwhile, children have health problems such as a history of low birth weight (LBW). Low birth weight is closely related to early growth disorders, especially at the age of 0–6 months, and is often caused by growth disorders in the womb or premature birth. Babies with low birth weight tend to experience breastfeeding problems, digestive disorders and malnutrition which can have long-term impacts on growth and development, including a higher risk of stunting (Halli et al., 2022).

The presence of comorbidities after birth such as congenital heart disease (CHD) also influences the incidence of stunting in children in the Durenan Community Health Center area (Fitriany et al., 2025; Murni et al., 2023). The causes of malnutrition, especially undernutrition, in children with congenital heart disease (CHD) are multifactorial. Causes include the underlying heart defect itself, hemodynamic factors, chronic hypoxemia, inadequate calorie intake, and increased energy expenditure compared to intake (hypermetabolism) (Robyn et al., 2024).

CONCLUSION

Stunting remains a significant health problem among children, particularly in rural areas. Modifiable risk factors, such as maternal chronic energy deficiency during pregnancy, can be addressed through improved education for prospective brides to achieve an optimal nutritional status and body weight before conception, thereby reducing the risk of low birth weight (LBW). Education on exclusive breastfeeding should also be provided from pregnancy through the breastfeeding period to support the achievement of exclusive breastfeeding practices. Exposure to cigarette smoke requires special attention, particularly from the prenatal period when the fetus is still in the womb. Inadequate nutritional intake may result from several factors, including socioeconomic constraints that limit access to adequate food and healthcare services.

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