



Overview of Risk Factors for Pregnant Women from the Incidence of Stunted Children in the Working Area of East Bogor Health Center for the Period November 2024 to April 2025

Keswari Aji Patriawati^{1*}, Vidi Posdo A. Simarmata², Batara Imanuel Sirait³, Christine Handayani Tampubolon¹

¹Department of Pediatrics, Faculty of Medicine, Universitas Kristen Indonesia

²Department of Medical Community, Faculty of Medicine, Universitas Kristen Indonesia

³Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Kristen Indonesia

*Email correspondence: keswari.patriawati@uki.ac.id

Track Record Article	Abstract
Revised: 19 July 2026 Accepted: 16 September 2026 Published: 28 September 2026 How to cite : Patriawati, K. A., Simarmata, V. P. A., Sirait, B. I., & Tampubolon, C. H. (2026). Overview of Risk Factors for Pregnant Women from the Incidence of Stunted Children in the Working Area of East Bogor Health Center for the Period November 2024 to April 2025. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 8(3), 191–200.	<i>Stunting, a condition in which children fail to grow due to chronic malnutrition, remains a serious public health problem in Indonesia, although its prevalence has decreased from 21.6% in 2022 to 19.8% in 2024, according to the 2024 Indonesian Nutritional Status Survey (SSGI). This study aims to analyze risk factors in pregnant women that contribute to the incidence of stunting in the work area of the East Bogor Health Center in the period November 2024 to April 2025. This study used a descriptive quantitative method, with a population of 52 mothers who had stunted children aged 0-59 months at the East Bogor Health Center. Data collection was conducted via an electronic questionnaire, and the data were analyzed using univariate methods. The results showed that the majority of respondent mothers were aged 20-35 years (78.8%), had a junior high school education (46.2%), and worked as housewives (76.9%). The most stunted children are 25-36 months (28.8%), with the female gender slightly more (50%). Regarding risk factors among pregnant women, 55.8% did not have anemia, and 53.8% routinely took blood-boosting tablets. As many as 82.7% of mothers do not experience Chronic Energy Deficiency (CED). The most common maternal age during pregnancy is 20-35 years (67.3%). Most of the respondents (76.9%) had no history of pregnancy complications, attended regular ANC visits (71.2%), did not experience weight loss during pregnancy (76.9%), and received adequate nutrition (76.9%). Family support was received by 92.3% of respondents, but 53.8% did not receive counseling and information related to pregnancy. This study underscores the importance of interventions from the get-go to prevent stunting, with a focus on nutrition and health education for pregnant women, as well as on improving access to and quality of antenatal services.</i> Keywords: <i>Chronic Energy Deficiency, East Bogor, Overview, Risk Factors, Stunting</i>

INTRODUCTION

Stunting is a condition of growth failure in children due to chronic malnutrition, especially during the first 1,000 days of life, which includes pregnancy to age two. This condition not only impacts a child's physical growth but also affects cognitive development and future productivity (Dhirah et al., 2022; Fitria & Astuti, 2023; Pibriyanti et al., 2023; Saniati et al., 2024). According to the Global Nutrition Report, worldwide, 149.2 million children under 5 are stunted, 45.4 million are wasted, and 38.9 million are overweight, while more than 2.2 billion adults are overweight or obese. Of the 194 countries assessed, 105 are on track to address childhood overweight, but anemia rates are worsening or showing no progress in 161 countries (Shafira et al., 2024).

The prevalence of stunting in Southeast Asia remains high, with several countries recording rates above the WHO threshold. Timor-Leste, for example, had the highest prevalence at 48.8%, followed by Indonesia (31.8%), Laos (30.2%), and Cambodia (29.9%) (Audi Setyawati et al., 2025b). According to the 2024 Indonesian Nutritional Status Survey (SSGI), released in 2025, the national prevalence of stunting decreased from 24.4% in 2021 to 21.6% in 2022, 21.5% in 2023, and 19.8% in 2024. Although the trend is encouraging, stunting remains a significant public health concern in Indonesia (Fitria & Astuti, 2023; Hermawati et al., 2025). Various risk factors in pregnant women have been identified as the main causes of stunting in children. According to the 2023 Indonesian Health Survey (SKI), the prevalence of anemia among pregnant women in Indonesia decreased to 27.7%, representing a substantial improvement compared with previous national estimates. Nevertheless, maternal undernutrition and pregnancy-related complications remain major public health concerns, contributing significantly to adverse maternal and neonatal outcomes, including maternal mortality, low birth weight, preterm birth, and stunting. This situation highlights the importance of interventions during pregnancy to prevent stunting (Audi Setyawati et al., 2025b; Puspitasari, 2023).

Research in various regions shows that factors such as maternal nutritional status during pregnancy, anemia, maternal age during pregnancy, and maternal height are significantly associated with stunting in children. For example, in the Salaman I Community Health Center (Puskesmas) work area in Magelang Regency, maternal nutritional status during pregnancy ($p=0.000$), history of anemia during pregnancy ($p=0.004$), and gestational age at delivery ($p=0.002$) were found to be associated with stunting in toddlers aged 24-59 months (Mahera & Santik, 2023). However, determinants of stunting can vary across regions due to differences in demographic characteristics, socioeconomic conditions, culture, access to healthcare services, and the inconsistent implementation of stunting prevention programs. Therefore, research findings from one region cannot necessarily be generalized to other regions.

The service area of the East Bogor Community Health Center (Puskesmas Bogor Timur) is characterized by a significant number of pregnant women. It is a site for the implementation of various programs aimed at accelerating the reduction of stunting. However, there is currently limited empirical evidence specifically evaluating the relationship between maternal risk factors during pregnancy and the incidence of stunting among children under five in this area. This situation highlights a local empirical gap: the lack of data characterizing maternal risk factors in the local population to inform the design of more targeted interventions. The novelty of this study lies in its presentation of up-to-date empirical evidence regarding the link between

maternal risk factors during pregnancy and stunting among children under five in the East Bogor Community Health Center's service area, utilizing data from 2025; this offers a contextual perspective distinct from previous studies conducted in other regions, such as the Salaman Community Health Center. The findings are expected to provide a foundation for developing stunting prevention strategies tailored to the characteristics of the East Bogor Community Health Center's service area. Based on this background, the research question posed is, "Are maternal risk factors during pregnancy associated with the incidence of stunting among children under five in the service area of the East Bogor Community Health Center in 2025?".

METHOD

This study employed a quantitative descriptive cross-sectional design to describe maternal risk factors associated with stunting among children aged 0–59 months in the working area of East Bogor Primary Health Center, Bogor City, Indonesia. The study was conducted from November 2024 to April 2025. The study population consisted of mothers with stunted children aged 0–59 months registered at East Bogor Primary Health Center. The sample size in the study was 52 mothers who had stunted children aged 0–59 months at the East Bogor Community Health Center, who met the inclusion criteria (mothers who had children aged 0–59 months classified as stunted based on the WHO Child Growth Standards, possessed complete maternal medical records, were willing to participate, and signed written informed consent) and exclusion criteria (mothers with incomplete medical records or who declined to complete the questionnaire).

Data collection was conducted by the research team using secondary data. Prior to data collection, the researchers obtained permission from the Head of East Bogor Primary Health Center and the Maternal and Child Health (MCH) Unit to access the required data. Secondary data were collected from maternal and child medical records. The researchers first identified all children aged 0–59 months who were diagnosed with stunting according to the health center's anthropometric records. Medical records were subsequently screened based on the study variables, including maternal history of anemia during pregnancy, history of chronic energy deficiency (CED), maternal age during pregnancy, pregnancy complications, antenatal care (ANC) visits, maternal weight changes during pregnancy, and history of iron (Fe) tablet consumption. Eligible records were extracted using a standardized data extraction sheet.

Descriptive analysis was performed using IBM SPSS Statistics version 26. Univariate analysis was conducted to summarize the distribution of each variable using frequencies,

percentages, means, and standard deviations where appropriate. This study received ethical approval from the ethics committee of the Center for Research and Community Service (LPPM) UKI under Ethical Clearance Number: 115/UKI.LPPM/PPM.00.00/ET.2024. Written informed consent was obtained from all participants before questionnaire administration, and all collected data were anonymized to protect participant confidentiality.

RESULTS

The risk factor variables analyzed in this study include education, occupation, anemia during pregnancy, iron supplement consumption during pregnancy, KEK (Chronic Energy Deficiency), age during pregnancy, history of complications, history of chronic diseases, history of ANC (Antenatal Care), weight loss during pregnancy, adequate nutritional intake, economic status, family support, counseling and information related to the health of pregnant women, age of the child, gender of the child, visits to the integrated health post (Posyandu), maternal LILA, and infant weight.

Table 1. Maternal, Child Demographic Data and Risk Factor Data for Pregnant Women

Indicator	Category	Quantity	Percentage
Maternal Demographic Data	Age		
	20-34 Years	41	78.8
	35-50 Years	11	21.2
	Education		
	College	2	3.8
	High School	12	23.1
	Middle School	24	46.2
	Elementary School	13	25
	Not attending school	1	1.9
	Job		
	Housewife	40	76.9
	Trader	5	9.6
	Teacher	2	3.8
Child Demographic Data	Self-Employed	2	3.8
	Domestic Assistant	3	5.9
	Age		
	0-12 months	14	26.9
	13-24 months	11	21.2
	25-36 months	15	28.8
	37-48 months	12	23.1
	Gender		
Baby's Weight	Male	26	50.0
	Female	26	50.0
	3.2 - 8.9 kg	28	53.8
	10.8 - 15.4 kg	24	46.2

Indicator	Category	Quantity	Percentage
Risk Factor Data for Pregnant Women	Anemia in Pregnancy		
	Yes	23	44.2
	No	29	55.8
	Consume Iron Supplement Tablets		
	Yes	28	53.8
	No	24	46.2
	Chronic Energy Deficiency		
	Yes	9	17.3
	No	43	82.7
	Age at Pregnancy		
	< 20 Years	9	17.3
	20 - 35 Years	35	67.3
	> 35 Years	8	15.4
	History of Complications during Pregnancy		
	No	40	76.9
	Preeclampsia	8	15.4
	Oligohydramnios	3	5.8
	History of Falls	1	1.9
	History of ANC during Pregnancy		
	Routine	37	71.2
	Not Routine	15	28.8
	Weight Loss During Pregnancy		
	Yes	12	23.1
	No	40	76.9
	Nutritional Intake During Pregnancy		
	Enough	40	76.9
	Not Enough	12	23.1
	Family Support During Pregnancy		
	Yes	48	92.3
	No	4	7.7
	Counseling and Information		
	Yes	24	46.2
	No	28	53.8

DISCUSSION

Stunting is a multifactorial condition resulting from complex interactions between biological, behavioral, environmental, and socioeconomic determinants. Previous studies have consistently classified these determinants into direct factors, including fetal growth restriction, low birth weight, recurrent childhood infections, and maternal nutritional status; indirect factors such as infant feeding practices, sanitation, and access to healthcare; and broader structural determinants including parental education, household socioeconomic status, and health literacy (Audi Setyawati et al., 2025a; Hapsari et al., 2022; Krisnana et al., 2020; Maulina & Rachmayanti 2021; Mporanyi et al., 2025). Therefore, understanding stunting

requires moving beyond individual risk factors and examining how these determinants interact throughout the first 1,000 days of life.

The present study demonstrates that maternal educational attainment was generally low, with nearly half of respondents having completed only junior high school (46.2%), while most mothers were housewives (76.9%). These findings are particularly important because formal education influences health literacy, which in turn affects a mother's ability to understand nutritional recommendations, recognize danger signs during pregnancy, and adopt appropriate infant feeding practices. Although being a housewife may theoretically provide more time for childcare, a limited educational background may reduce the ability to interpret health information, critically evaluate nutritional advice, or independently seek reliable information. Consequently, frequent contact with health services alone may not translate into effective preventive behaviors if communication is not adapted to mothers' educational backgrounds.

One of the most striking findings in this study is the apparent paradox between healthcare utilization and health education. Although most mothers reported attending routine antenatal care (ANC) visits, more than half (53.8%) reported not receiving counseling or information on maternal nutrition and pregnancy health. This discrepancy suggests that ANC utilization should be assessed not solely by the number of visits but also by the quality and comprehensiveness of services delivered. In many primary healthcare settings, ANC may still be predominantly focused on administrative record-keeping and routine clinical assessments, such as blood pressure measurement, maternal weight monitoring, and fetal examination. At the same time, individualized nutritional counseling receives less attention due to limited consultation time, high patient loads, or insufficient counseling capacity among healthcare workers. Consequently, high ANC coverage may overestimate the effectiveness of maternal health services if educational components are inadequately delivered. This finding highlights an important quality-of-care gap within primary healthcare services in urban Indonesia. It suggests that improving the content of ANC may be as important as increasing its coverage.

The coexistence of relatively high ANC attendance with inadequate maternal counseling may also explain why several nutritional risk factors remained prevalent in this population. Approximately 44.2% of mothers experienced anemia during pregnancy, while only 53.8% reported consuming iron supplementation. These findings indicate that attendance alone is insufficient to ensure adherence to nutritional recommendations. Previous studies have demonstrated that counseling quality, communication effectiveness, and maternal comprehension strongly influence compliance with iron supplementation and dietary recommendations during pregnancy. Therefore, strengthening interpersonal communication

during ANC may represent an important strategy for reducing nutritional risk factors associated with stunting.

An equally interesting finding is that most mothers reported adequate nutritional intake during pregnancy (76.9%), yet all children included in this study experienced stunting. This apparent contradiction deserves careful interpretation and represents one of the important contributions of this study. First, maternal nutritional intake was assessed retrospectively through self-report, making recall bias unavoidable. Mothers may unintentionally overestimate the adequacy of their dietary intake or report socially desirable responses, particularly when recalling pregnancies that occurred several years earlier. Second, adequate maternal dietary intake during pregnancy does not necessarily reflect nutritional status before conception or throughout fetal development. Maternal chronic undernutrition, micronutrient deficiencies, pre-pregnancy anemia, or placental dysfunction may have already affected fetal growth before dietary improvements occurred. Consequently, fetal growth restriction or suboptimal intrauterine development may predispose children to stunting despite apparently adequate nutrition during pregnancy. Third, stunting develops cumulatively during the first 1,000 days of life. Therefore, adequate prenatal nutrition alone cannot compensate for adverse postnatal factors such as recurrent infections, suboptimal complementary feeding practices, poor sanitation, or inadequate psychosocial stimulation. This finding reinforces current evidence that stunting is not solely determined by maternal dietary intake during pregnancy but reflects the cumulative effects of prenatal and postnatal exposures.

The maternal characteristics observed in this study are generally comparable with previous reports from Southeast Asia. Kang and Kim reported that mothers of malnourished children in Myanmar commonly had low educational attainment, high rates of anemia, and inadequate ANC utilization (Kang YunHee & Kim JiHye, 2019). Similarly, Astuti et al. reported that maternal anemia, suboptimal breastfeeding practices, and low educational background remained common among mothers of stunted children in Indonesia (Astuti et al., 2024; Astuti et al., 2021). Nevertheless, unlike previous studies that mainly focused on identifying conventional risk factors, the present study demonstrates that even among mothers reporting adequate dietary intake and relatively high ANC attendance, substantial gaps remained in nutrition education and counseling. This observation suggests that the effectiveness of maternal health services should be evaluated not only by service coverage indicators but also by the quality of health education delivered during routine care.

The findings should also be interpreted in light of several limitations. First, the cross-sectional design precludes causal inference between maternal characteristics and stunting

outcomes. Second, several variables, including maternal nutritional intake, iron tablet consumption, and counseling history, relied on maternal recall, which may introduce recall bias and social desirability bias. Third, because the study was conducted in a single primary healthcare area with a relatively limited sample size, the findings may not be generalizable to all urban or rural populations in Indonesia. Finally, important determinants such as household food security, environmental sanitation, paternal characteristics, child dietary diversity, and infectious disease history were not comprehensively assessed, preventing a more complete evaluation of the pathways leading to stunting.

Despite these limitations, the study provides important practical implications for public health practice. For Puskesmas Bogor Timur, strengthening the quality of ANC should become a priority by ensuring that every ANC visit includes standardized, individualized counseling on maternal nutrition, iron supplementation adherence, infant feeding practices, and the first 1,000 days of life. Routine monitoring should evaluate not only ANC coverage but also counseling quality and maternal comprehension. At the Bogor City Health Office level, capacity-building programs for midwives and primary healthcare workers should emphasize effective communication skills and nutrition education to improve health literacy among mothers with lower educational backgrounds. Furthermore, within Indonesia's National Strategy for Accelerating Stunting Reduction, these findings support expanding program evaluation beyond service utilization indicators toward quality-of-care indicators, including the completeness of nutrition counseling, maternal understanding of key messages, and behavioral changes achieved following ANC services. Strengthening these educational components may improve the effectiveness of existing maternal and child health programs and contribute more substantially to reducing stunting prevalence.

CONCLUSION

This descriptive cross-sectional study describes several maternal and health service characteristics among mothers in the East Bogor Community Health Center catchment area. Maternal anemia remained common, although most mothers reported routine ANC attendance, iron supplementation, adequate nutritional intake, and strong family support. However, gaps were observed in the provision of nutrition counseling during pregnancy. These findings describe patterns within the study population but do not establish associations or causal relationships with childhood stunting. Maternal education may provide important context for nutrition communication, although health literacy and ANC quality were not directly measured. Practically, the findings support strengthening nutrition counseling during ANC, maternal

anemia monitoring, iron supplementation, and communication tailored to mothers' educational needs. Further analytical and longitudinal studies are needed to examine potential relationships and causal pathways between these factors and childhood stunting.

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