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Bivariate Associations of Maternal, Obstetric, and Birth Characteristics with Stunting among Children Under Five in an Indonesian Stunting-Locus Village

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ABSTRACT

Stunting remains an important public health problem in Indonesia, including in villages designated as stunting loci. This study examined associations between maternal characteristics, obstetric history, birth characteristics, and stunting status among children aged 0–59 months in Pujo Basuki Village, Central Lampung. This analytic cross-sectional study included all 41 eligible mother–child pairs identified in the village sampling frame. Maternal and obstetric data were obtained through structured interviews using a previously tested questionnaire. Stunting was defined as a height-for-age z-score (HAZ) <−2 standard deviations according to the WHO Child Growth Standards. Because only 14 children were classified as stunted, the analysis was restricted to descriptive and bivariate comparisons to avoid an overfitted multivariable model. Fourteen of 41 children (34.1%) were stunted; this figure represents the observed proportion in the study sample. Gravidity, parity, mode of delivery, birth length, and birth weight differed significantly by stunting status in bivariate analyses ($p<0.05$). Maternal age, age at the index pregnancy, education, occupation, abortion history, and pregnancy complications were not statistically associated with stunting status. In this small cross-sectional sample, stunting status was associated with selected obstetric and birth characteristics. These findings are exploratory, do not establish causality, and require confirmation in larger studies that measure socioeconomic, maternal nutritional, infant-feeding, infection, and sanitation factors.

Keywords: Birth characteristics; Children under five; Stunting; Maternal characteristics; Obstetric history.

INTRODUCTION

Stunting continues to be one of the most serious nutritional problems facing children worldwide. The World Health Organization (WHO) reported that in 2022, approximately 148.1 million (22.3%) children under five years of age were affected by stunting, with more than half of all stunted children living in Asia (52%) and two in five living in Africa (43%) (WHO, 2023). Although global stunting prevalence declined from 33.0% in 2000 to 22.3% in 2022, more than one in four children in South-eastern Asia remain stunted (WHO, 2023). The condition is defined as chronic malnutrition characterized by a height-for-age (HAZ) Z-score below −2 standard deviations from the WHO Child Growth Standards median (WHO, 2024). In Indonesia, national stunting prevalence fell from 21.5% in 2023 to 19.8% in 2024; yet this figure remains well above the 14.2% target for 2029 set under the National Medium-Term Development Plan (RPJMN) 2025–2029 (Kementerian Kesehatan Republik Indonesia, 2025). The implications are far-reaching, given that stunting imposes irreversible consequences on children's physical growth and development. Stunted children tend to fall short of their maximum height potential without timely correction. Beyond physical growth, stunting undermines intellectual development and cognitive capacity, contributing to learning difficulties in affected children. Over time, stunted individuals face greater vulnerability to infectious diseases and carry a higher risk of degenerative non-communicable diseases in later life, with downstream effects on adult productivity and economic capability (Pitoyo et al., 2022).

According to the WHO Conceptual Framework on Childhood Stunting, the condition arises from a wide range of intersecting factors spanning household conditions, the physical environment, socioeconomic circumstances, and cultural context (Beal et al., 2018). These can be organized into proximal determinants, covering maternal nutritional status, breastfeeding practices, complementary feeding, and infectious disease exposure during the growth period, and distal determinants, covering maternal education, dietary habits, access to healthcare, and the quality of water and sanitation. Of these, maternal factors stand out as particularly consequential in the development of childhood stunting. Mothers serve as the principal source of a child's health and nutritional well-being, above all during the first 1,000 days of life, a window widely regarded as foundational to a child's nutritional trajectory

(Saleh et al., 2021). Evidence from sub-Saharan Africa indicates that improved utilization of maternity care was the most important distal determinant associated with reduced stunting, and improving the mother's overall care has been identified as a key determinant in reducing stunting in developing countries (Amaha & Woldeamanuel, 2021; Buisman et al., 2019). Maternal education, too, bears a strong relationship with child growth outcomes; in Indonesia, mothers with primary education or lower were 1.587 times more likely than mothers with a college education to have a stunted child under two years (Laksono et al., 2022). Other maternal risk factors linked to stunting include unfavorable obstetric history, short interpregnancy intervals, high-risk maternal age at delivery, and high parity (Amaha & Woldeamanuel, 2021; Sukmawati et al., 2018; Syahril et al., 2020).

The economic toll of stunting is equally striking, with losses due to stunting and malnutrition in Indonesia estimated at 2–3% of Gross Domestic Product (GDP) (World Bank, 2015). Responding to this burden, the Indonesian government has drawn on SDG Goal 2 regarding the elimination of hunger, attainment of food security, improved nutrition, and the promotion of sustainable agriculture, as well as Presidential Regulation No. 72 of 2021 on the Acceleration of Stunting Reduction (Presiden Republik Indonesia, 2021), to develop targeted programmatic responses addressing the root causes of stunting. A notable component of this response is the establishment of stunting locus villages, villages within designated stunting locus areas selected as focal points for intervention through coordinated efforts among Regional Government Organizations, civil society organizations, and local communities. Studying these villages carries particular scientific value, as the data generated can directly inform the design of regionally tailored interventions. This is all the more relevant because stunting risk factors tend to vary by region and research findings frequently differ across geographic settings (Yaya et al., 2022).

Data from the 2024 Indonesian Nutritional Status Survey placed the prevalence of stunting in Lampung Province at 15.9%, lower than the national figure of 19.8% but still indicating a persistent public health problem (Kementerian Kesehatan Republik Indonesia, 2025). Pujo Basuki Village, Trimurjo District, Central Lampung Regency, had been designated as a stunting-locus village. Local program records indicated a persistent burden of stunting among children under five, but evidence on the distribution of maternal, obstetric, and birth characteristics in this setting remained limited. The present study therefore examined the associations of maternal characteristics, obstetric history, and child characteristics at birth with current stunting status among children aged 0–59 months in Pujo Basuki Village. Given the cross-sectional design, the study was intended to identify associations rather than incidence, temporal effects, or causal predictors.

METHODS

This observational analytic study used a cross-sectional design and was conducted in Pujo Basuki Village, Trimurjo District, Central Lampung Regency. The source population consisted of children aged 0–59 months who resided in the village with their biological mothers during the study period. The village register identified 41 eligible mother–child pairs; all met the inclusion criteria and were enrolled through total sampling. Children were excluded if age or anthropometric information required to determine height-for-age status was unavailable. Variables were organized conceptually into maternal characteristics (current maternal age, age at the index pregnancy, education, and occupation), obstetric history (gravidity, parity, abortion history, pregnancy complications, and mode of delivery), child characteristics at birth (birth length and birth weight), and the current outcome of child stunting. Maternal and obstetric information was obtained through structured interviews conducted by the research team with support from the village midwife using a questionnaire that had previously undergone validity and reliability testing. Stunting was defined as HAZ <-2 SD relative to the median of the sex- and age-specific WHO Child Growth Standards. Anthropometric assessment was performed jointly by the research team and village health personnel. However, the retained study documentation did not record the equipment model, calibration log, number of repeated measurements, or the software/version used to calculate HAZ; this reporting limitation is acknowledged when interpreting the findings.

Data were processed and analyzed using IBM SPSS Statistics for Windows, version 27.0. Quantitative variables were assessed for distribution using the Shapiro–Wilk test and are presented as mean±standard deviation when approximately normally distributed or median (minimum–maximum) otherwise. Categorical variables are presented as frequency and percentage. Between-group comparisons used the independent-samples t-test for normally distributed continuous variables and the Mann–Whitney U test for non-normally distributed variables. Associations between categorical variables and stunting status were examined using the chi-square test or Fisher's exact test when expected cell counts were small. Statistical significance was set at $p<0.05$. A previously fitted logistic regression model contained numerous parameters for only 14 outcome events and produced very wide confidence intervals, including estimates close to zero. Because this event-to-parameter ratio created a high risk of overfitting, sparse-data bias, and unstable coefficients—particularly for the intrinsically correlated pairs of current maternal age versus age at pregnancy and gravidity versus parity—the multivariable model was removed from the revised analysis. Results are therefore reported as unadjusted, exploratory associations and are not interpreted causally.

Ethical Information

This study received ethical clearance from the Ethical Committee for Health Research at Poltekkes Kemenkes Tanjungkarang (approval number: No. 403/KEPK-TJK/V/2024). Written informed consent was obtained from

all respondents' parents or legal guardians prior to data collection. Respondents' confidentiality was maintained throughout the research process. The results were presented without disclosing participants' personal data and identities.

RESULTS AND DISCUSSION

Characteristics of Study Subjects

All 41 eligible mother–child pairs in the village sampling frame were included in the analysis. Fourteen children were classified as stunted, corresponding to an observed sample proportion of 34.1%; this should not be interpreted as a population prevalence estimate beyond the defined village sample. The mean current maternal age was 31.02 years (SD 5.58), and the mean age at the index pregnancy was 27.80 years (SD 5.34). Most mothers had completed no more than 12 years of education (73.2%), and 70.7% were not formally employed or were homemakers.

Regarding obstetric history, 61.0% of mothers were multigravida, 73.2% were primiparous, and 90.2% reported no previous abortion. Thirty-nine mothers (95.1%) had no recorded complication during the index pregnancy; one reported hypertension and one reported turbid amniotic fluid. Twenty-four children (58.5%) were delivered vaginally and 17 (41.5%) by caesarean section. Mean birth weight was 3.041 kg (SD 0.396), and median birth length was 49 cm (range 46–55 cm). Birth length and birth weight are characteristics of the child at birth and were analyzed separately from maternal and obstetric characteristics.

Table 1. Sample characteristics

Characteristics	Value
Maternal age (years)	31.02±5.583
Maternal age at pregnancy (years)	27.80±5.344
Maternal education level, N (%)	
Basic (≤12 years)	30 (73.2)
Advanced (>12 years)	11 (26.8)
Maternal occupation, N (%)	
Unemployed (housewife)	29 (70.7)
Trader/Self-employed	4 (9.8)
Civil servant (ASN)	4 (9.8)
Farmer	2 (4.9)
Laborer	1 (2.4)
Midwife	1 (2.4)
Obstetric history: gravidity, N (%)	
Primigravida	16 (39)
Multigravida	25 (61)
Obstetric history: parity, N (%)	
Primiparous	30 (73.2)
Multiparous	11 (26.8)
Obstetric history: abortion, N (%)	
No history	37 (90.2)
History present	4 (9.8)
Mode of delivery, N (%)	
Vaginal delivery	24 (58.5)
Caesarean section	17 (41.5)
Pregnancy complications, N (%)	
None	39 (95.1)
Hypertension	1 (2.4)
Turbid amniotic fluid	1 (2.4)
Birth length (centimeters)	49 (46–55)
Birth weight (kilograms)	3.041±0.3956
Stunting status, N (%)	
Normal	27 (65.9)
Stunting	14 (34.1)

Note: Values are mean±SD, median (min–max), or n (%). Source: research data, analyzed.

Bivariate Analysis of Factors Associated with Stunting Status

Table 2 presents the unadjusted comparisons by stunting status. Gravidity, parity, mode of delivery, birth length, and birth weight were statistically associated with stunting status ($p<0.05$). The Pearson chi-square result for gravidity was $p=0.019$; all expected cell counts exceeded 5, so this test was acceptable. Because the parity table contained an expected cell count below 5, Fisher's exact test was used and yielded $p=0.026$. Among multigravida mothers, 12 of 25 children (48.0%) were stunted, compared with 2 of 16 children (12.5%) among primigravida mothers. The corresponding unadjusted odds ratio (OR) was 6.46 (95% CI 1.21–34.55). Among multiparous mothers, 7 of 11 children (63.6%) were stunted, compared with 7 of 30 children (23.3%) among primiparous mothers, giving an unadjusted OR of 5.75 (95% CI 1.29–25.56). These ORs describe crude associations only. Their wide confidence intervals indicate low precision and preclude claims of independent prediction or causality. Mode of delivery, birth length, and birth weight also differed by stunting status, whereas current maternal age, age at the index pregnancy,

education, occupation, abortion history, and recorded pregnancy complications did not. Because several cells contained few observations and multiple comparisons were performed, all statistically significant findings should be considered exploratory.

Table 2. Bivariate analysis of maternal, obstetric, and birth characteristics by stunting status

Variables	Stunting Status		*p*-value
	Normal (n=27)	Stunting (n=14)	
Maternal age (years)	30.85±4.905	31.57±6.734	0.698[a]
Maternal age at pregnancy (years)	27.81±4.674	27.79±6.647	0.987[a]
Maternal education level, N (%)			0.064[b]
Basic (≤12 years)	17 (63)	13 (92.9)	
Advanced (>12 years)	10 (37)	1 (7.1)	
Maternal occupation, N (%)			0.058[b]
Unemployed (housewife)	17 (63)	12 (85.7)	
Trader/Self-employed	4 (14.8)	0	
Civil servant (ASN)	4 (14.8)	0	
Farmer	0	2 (14.3)	
Laborer	1 (3.7)	0	
Midwife	1 (3.7)	0	
Obstetric history: gravidity, N (%)			0.019[c]
Primigravida	14 (51.9)	2 (14.3)	
Multigravida	13 (48.1)	12 (85.7)	
Obstetric history: parity, N (%)			0.026[b]
Primiparous	23 (85.2)	7 (50)	
Multiparous	4 (14.8)	7 (50)	
Obstetric history: abortion, N (%)			0.107[b]
No history	26 (96.3)	11 (78.6)	
History present	1 (3.7)	3 (21.4)	
Mode of delivery, N (%)			0.033[c]
Vaginal delivery	19 (70.4)	5 (35.7)	
Caesarean section	8 (29.6)	9 (64.3)	
Pregnancy complications, N (%)			0.132[c]
None	27 (100)	12 (85.7)	
Hypertension	0	1 (7.1)	
Turbid amniotic fluid	0	1 (7.1)	
Birth length (centimeters)	49 (46–55)	47 (47–52)	0.017[d]
Birth weight (kilograms)	3.130±0.4065	2.871±0.3221	0.046[a]

Note: [a]Independent-samples t-test; [b]Fisher's exact test; [c]Pearson chi-square test; [d]Mann–Whitney U test. Percentages are column percentages. ORs reported in the text are crude estimates for stunting: multigravida versus primigravida and multiparous versus primiparous. Source: research data, analyzed.

The principal finding of this study is not that a single maternal factor predicts stunting, but that stunting clustered with a pattern of reproductive history and size at birth in this small village sample. Gravidity, parity, mode of delivery, birth length, and birth weight differed by current stunting status, whereas current maternal age and age at the index pregnancy did not. The distinction is important: these are unadjusted cross-sectional associations and cannot identify temporal sequence, independence, or causality. Within the WHO conceptual framework, reproductive history and birth size sit within a broader pathway that also includes maternal nutritional status, fetal growth, infant feeding, infection, household resources, and sanitation. Because several of these domains were not measured, the results should be interpreted as signals of accumulated vulnerability rather than isolated causal effects.

The clearest observed pattern concerned gravidity and parity. Stunting occurred in 48.0% of children of multigravida mothers compared with 12.5% of children of primigravida mothers, corresponding to a crude OR of 6.46 (95% CI 1.21–34.55). It occurred in 63.6% of children of multiparous mothers compared with 23.3% of children of primiparous mothers, with a crude OR of 5.75 (95% CI 1.29–25.56). These estimates are statistically compatible with positive associations, but the wide intervals show substantial uncertainty about their magnitude. Gravidity and parity should also not be treated as interchangeable exposures. Gravidity captures the number of pregnancies, whereas parity reflects pregnancies reaching viable birth; both may proxy repeated maternal nutritional demands, short interpregnancy intervals, household resource dilution, and cumulative caregiving burden. Their high conceptual correlation, however, means that the data cannot determine which pathway is most influential. The heterogeneous findings reported by Maravilla et al. (2020) and Sari and Sartika (2021) further suggest that reproductive history operates through context-dependent biological and social mechanisms rather than a universal dose-response relationship.

The association between caesarean delivery and stunting requires even greater caution. Caesarean delivery was more frequent among children with stunting, but the operation itself should not be interpreted as a direct cause. Confounding by indication is plausible: maternal disease, fetal growth restriction, preterm birth, or obstetric complications may increase both the probability of caesarean delivery and subsequent growth impairment. Postnatal pathways, including delayed initiation of breastfeeding and early feeding disruption, may also contribute, but these variables were not measured. Kumar et al. (2021) reported an association between caesarean delivery and a composite malnutrition outcome, whereas Saaka and Hammond (2020) found no consistent evidence of impaired childhood growth attributable to caesarean delivery alone. Accordingly, mode of delivery in the present study is better interpreted as a marker of perinatal complexity than as an intervention target.

Birth length and birth weight provide the most biologically coherent link with later linear growth. Children with stunting had a lower median birth length and lower mean birth weight than children without stunting. Smaller size at birth may reflect fetal growth restriction arising from maternal undernutrition, placental dysfunction, infection,

or other adverse intrauterine exposures. This interpretation is consistent with evidence that growth deficits can originate before birth and persist across the first 1,000 days (Beal et al., 2018; Gusnedi et al., 2023). Nevertheless, birth size is not destiny. Catch-up or further growth faltering depends on breastfeeding, complementary feeding, dietary quality, recurrent illness, care practices, and the household environment. Because the study did not measure these intervening factors, birth length and weight should be regarded as early markers of vulnerability, not sufficient explanations for current stunting.

The absence of statistically significant associations for maternal age, education, occupation, abortion history, and recorded pregnancy complications does not establish that these factors are unimportant. With only 41 participants and 14 stunting events, the study had limited power to detect modest associations, particularly when categories were uneven or contained very few observations. Broad classifications, such as education of 12 years or less and employment status, may also conceal meaningful gradients in health literacy, income, decision-making autonomy, and access to care. Similarly, only two pregnancy complications were recorded, making a stable comparison impossible. These null findings should therefore be described as inconclusive within this sample rather than evidence of no relationship.

For stunting-locus programs, the findings support a life-course assessment rather than an intervention focused on one statistically significant variable. Reproductive history and birth records can help identify families who may benefit from closer growth surveillance, but screening should be combined with assessment of maternal nutritional status, birth spacing, antenatal care, breastfeeding, complementary feeding, infection, food security, and water and sanitation. The results do not justify discouraging caesarean delivery when clinically indicated or labeling multigravida and multiparous mothers as causal risk groups. Their practical value lies in prompting a more comprehensive review of accumulated maternal, perinatal, and household disadvantage and directing proportionate follow-up within existing maternal and child health services.

This study contributes complete enumeration of the defined village sampling frame and a focused description of a stunting-locus setting, but its limitations materially constrain inference. The cross-sectional design precludes temporal and causal conclusions; the small number of events produces imprecise estimates; multiple bivariate tests increase the probability of chance findings; and the single-village setting limits external validity. Anthropometric documentation did not retain sufficient detail on instrument model, calibration, repeated measurements, or HAZ calculation software. Important confounders—including maternal height and nutritional status, socioeconomic position, gestational age, birth interval, infant feeding, dietary intake, infection, food security, and sanitation—were not measured. The earlier multivariable model was therefore appropriately removed because the number of parameters was disproportionate to 14 stunting events and included correlated variables. Future prospective multicentre studies should use standardized anthropometry, prespecified causal diagrams, adequate event counts, and parsimonious adjusted models. Until such evidence is available, the present findings should remain explicitly exploratory and locally contextualized.

CONCLUSION

Among the 41 children aged 0–59 months included from Pujo Basuki Village, 14 (34.1%) were classified as stunted. This percentage is the observed proportion in the defined study sample and should not be generalized as a broader population prevalence. Gravidity, parity, mode of delivery, birth length, and birth weight were associated with stunting status in unadjusted analyses, whereas current maternal age and age at the index pregnancy were not. Because the study was cross-sectional, included few outcome events, and did not measure several major socioeconomic, nutritional, feeding, infection, and sanitation factors, the findings neither establish causality nor support claims of independent prediction or protection. They provide local, hypothesis-generating evidence that should be tested in larger, methodologically rigorous studies.

CONFLICT OF INTEREST

The authors declared no conflict of interest in the study.

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REFERENCES

Amaha, N. D., & Woldeamanuel, B. T. (2021). Maternal factors associated with moderate and severe stunting in Ethiopian children: analysis of some environmental factors based on 2016 demographic health survey. *Nutrition Journal*, *20*(1), 18. [Crossref], [Publisher]

Beal, T., Tumilowicz, A., Sutrisna, A., Izwardy, D., & Neufeld, L. M. (2018). A review of child stunting determinants in Indonesia. *Maternal & Child Nutrition*, *14*(4). [Crossref], [Publisher]

Buisman, L. R., Van de Poel, E., O'Donnell, O., & van Doorslaer, E. K. A. (2019). What explains the fall in child stunting in Sub-Saharan Africa? *SSM - Population Health*, *8*, 100384. [Crossref], [Publisher]

Gusnedi, G., Nindrea, R. D., Purnakarya, I., Umar, H. B., Andrafikar, Syafrawati, Asrawati, Susilowati, A., Novianti, Masrul, & Lipoeto, N. I. (2023). Risk factors associated with childhood stunting in Indonesia: A systematic review and meta-analysis. *Asia Pacific Journal of Clinical Nutrition*, *32*(2), 184–195. [Crossref], [Publisher]

Kementerian Kesehatan Republik Indonesia. (2025). *Survei Status Gizi Indonesia 2024*. [Publisher]

Kumar, P., Chauhan, S., Patel, R., Srivastava, S., & Bansod, D. W. (2021). Prevalence and factors associated with triple burden of malnutrition among mother-child pairs

in India: a study based on National Family Health Survey 2015–16. *BMC Public Health*, *21*(1), 391. [Crossref], [Publisher]

Laksono, A. D., Wulandari, R. D., Amaliah, N., & Wisnuwardani, R. W. (2022). Stunting among children under two years in Indonesia: Does maternal education matter? *PLOS ONE*, *17*(7), e0271509. [Crossref], [Publisher]

Maravilla, J. C., Betts, K., Adair, L., & Alati, R. (2020). Stunting of children under two from repeated pregnancy among young mothers. *Scientific Reports*, *10*(1), 14265. [Crossref], [Publisher]

Pitoyo, A. J., Saputri, A., Agustina, R. E., & Handayani, T. (2022). Analysis of Determinan of Stunting Prevalence among Stunted Toddlers in Indonesia. *Populasi*, *30*(1), 36. [Crossref], [Publisher]

Presiden Republik Indonesia. (2021). *Peraturan Presiden Republik Indonesia Nomor 72 Tahun 2021 tentang Percepatan Penurunan Stunting*. Sekretariat Negara Republik Indonesia.

Saaka, M., & Hammond, A. Y. (2020). Caesarean Section Delivery and Risk of Poor Childhood Growth. *Journal of Nutrition and Metabolism*, *2020*, 1–12. [Crossref], [Publisher]

Saleh, A., Syahrul, S., Hadju, V., Andriani, I., & Restika, I. (2021). Role of Maternal in Preventing Stunting: a Systematic Review. *Gaceta Sanitaria*, *35*, S576–S582. [Crossref], [Publisher]

Sari, K., & Sartika, R. A. D. (2021). The Effect of the Physical Factors of Parents and Children on Stunting at Birth Among Newborns in Indonesia. *Journal of Preventive Medicine and Public Health*, *54*(5), 309–316. [Crossref], [Publisher]

Sukmawati, Hendrayati, Chaerunnimah, & Nurhumaira. (2018). Status Gizi Ibu Saat Hamil, Berat Badan Lahir Bayi dengan Stunting pada Balita. *Media Gizi Pangan*, *25*. [Crossref], [Publisher]

Syahril, E., Mappaware, N. A., Akib, M., & Mursyid, M. (2020). Analysis of Obstetric Medical Determinant Factors toward Mothers with the Stunting Children. *Green Medical Journal*, *2*(3), 88–100. [Crossref], [Publisher]

World Bank. (2015, April 23). *The double burden of malnutrition in Indonesia*. World Bank. [Publisher]

World Health Organization. (2023). *Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates: Key findings of the 2023 edition*. World Health Organization. [Publisher]

World Health Organization. (2024). *World health statistics 2024: Monitoring health for the SDGs, sustainable development goals*. World Health Organization. [Publisher]

Yaya, S., Oladimeji, O., Odusina, E. K., & Bishwajit, G. (2022). Household structure, maternal characteristics and children's stunting in sub-Saharan Africa: evidence from 35 countries. *International Health*, *14*(4), 381–389. [Crossref], [Publisher]