Indonesian Journal of Global Health Research
Volume 7 Number 1, April 2025
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

FACTORS INFLUENCING THE INCIDENCE OF STUNTING: A CASE-CONTROL STUDY AT BALIKPAPAN PRIMARY HEALTHCARE

Rina Marini*, Ratih Wirapuspita Wisnuwardani, Nur Rohmah
Faculty of Public Health, Universitas Mulawarman, Jl. Kuaro, Gn. Kelua, Samarinda Ulu, Samarinda, Kalimantan Timur 75119, Indonesia
*rinamariniskm@gmail.com

ABSTRACT
Stunting is a serious health issue in Indonesia, with long-term impacts on children's development. SSGI 2022 data shows a national prevalence of 21.6%, down from the previous year but still above the WHO standard and the 2024 target. In East Kalimantan, the prevalence of stunting reached 23.9% in 2022, up from the previous year and a concern as the province will become the new capital city. Stunting impacts brain development and the risk of long-term chronic diseases, influenced by maternal education and employment, as well as limited nutritional knowledge and parenting time. This analytical observational study with a case-control design was conducted in December 2023 at Gunung Sari Ulu Primary Healthcare working area with 30 respondents (15 cases, 15 controls) selected by purposive sampling. Data were collected through questionnaires and assessment of children's nutritional status measurements using a microtoise and infantometer . Stunting is defined as a height or length below -2 SD (WHO). Data analysis was performed using chi-square tests to assess the relationship between variables. No association was found between child gender and stunting (P-value = 1). Mothers with low education levels had a 1.313 times higher risk of having stunted children (P-value = 0.713). Although not statistically significant, non-working mothers had a 2.364 times higher risk of having stunted children compared to working mothers (P-value = 0.651). No significant relationship was found between child gender and stunting incidence. Maternal education and employment status are identified as risk factors for stunting, although not statistically significant.

Keywords: characteristics socio-demographic; mother education; stunting

How to cite (in APA style)
Marini, R., Wisnuwardani, R. W., & Rohmah, N. (2025). Factors Influencing the Incidence of Stunting: A case-control study at Balikpapan Primary Healthcare. Indonesian Journal of Global Health Research, 7(2), 37-44. https://doi.org/10.37287/ijghr.v7i2.5112.

INTRODUCTION

Stunting refers to a condition where a toddler has a lower height or length compared to his/her age. This condition is measured based on the height or length that is below minus two standard deviations from the median of child growth standards set by the World Health Organization (Rusliani et al., 2022). Stunting is still a serious health problem in Indonesia (Syahruddin et al., 2022). Although the prevalence has decreased in recent years, SSGI 2022 data shows the prevalence of stunting at 21.6%, down from 24.4% the previous year (Asnawi et al., 2024) . This figure is still far from the national target of 14% in 2024 and the WHO standard of below 20% (Aryastami, 2017). Since 2013, the prevalence of stunting in Indonesia has decreased from 37.2%, but remains a major challenge (Setiyawati et al., 2024) . According to the Indonesian Health Survey (SKI), the national stunting prevalence rate in 2023 reached 21.5% (Auliyah et al., 2024) . The prevalence of stunting in Indonesia is included in the high prevalence category when compared to ASEAN countries, similar to the situation in Cambodia and Myanmar (Sutopo & W, 2021).

In East Kalimantan, the prevalence of stunting in toddlers varies each year. In 2022, the prevalence reached 23.9%, an increase of 1.1% from the previous year, ranking it 16th nationally (Sekretariat BKKBN, 2023). Despite preventive efforts, this figure is still high by

WHO standards, especially since East Kalimantan is a candidate for the new capital city. This makes stunting a health problem that requires serious attention because of its impact on child development (Winowatan et al., 2017). Stunting has both short-term and long-term adverse effects. In the short term, stunting interferes with brain development, intelligence, and physical growth. Long-term impacts include increased risk of non-communicable diseases, decreased cognitive quality, and low educational achievement, leading to decreased economic productivity in adulthood (Ridua & Djurubassa, 2020) . Stunting in toddlers can increase the risk of non-communicable diseases such as obesity and hypertension in the future. Stunting affects low muscle mass and increased body fat, especially in the upper body and hips. Stunting children tend to have higher systolic blood pressure, increasing the risk of hypertension (Kurniati et al., 2023). Maternal education also affects the incidence of stunting, low nutritional knowledge (Savita & Amelia, 2020) and working mothers have limited time to care for children contributing to high stunting rates (Domili et al., 2021) . UNICEF states that toddler growth is influenced by direct factors, such as nutritional intake, LBW, and infectious diseases, as well as indirect factors, such as exclusive breastfeeding, gender, maternal height, education, and economy, regular visits to the integrated health post can help monitor child growth and prevent stunting (Abimayu & Rahmawati, 2023). The aim of this study is to identify the factors associated with stunting among children aged 6–59 months in the working area of Balikpapan Primary Healthcare.

METHOD

This research is a quantitative research with case-control approach implemented in the month December 2023. Withdrawal sample done with purposive sampling technique. Number sample in study This is 30 respondents, consisting of of 15 cases and 15 controls, with ratio 1:1. Data is collected through interview use questionnaire for get data about characteristics respondents, such as age mother, employment status, and level education. Nutritional status measurement child done with measure height using microtoise with 0.1 cm approach, and body length using infantometer. Children are categorized as stunted if height or body length is below -2 standard deviation (SD) based on standard WHO growth. Data analysis was conducted with two approaches. In this study, Mother education, Mother's employment status, and child gender are demographic variables or respondent characteristics that are objective and factual. Because these data are not generally obtained through scale instruments, they do not require validity and reliability testing. Analysis univariate used for describe distribution frequency and percentage characteristics Respondent each variable research. While analysis bivariate using the chi-square test to know connection between variable free and variable bound. Measurement big risk in study This counted using odds ratio.

RESULT

Table 1.
Frequency Distribution of Respondents

Characteristics Respondent		f	%
Number of children mother:	1	2	6.7
	2	21	70
	3	1	3.3
	4	3	10
	5	2	6.7
	6	1	3.3
Integrated Health Service Post:	Sartika 1	5	16.7
	Sartika 4	16	53.3
	Sartika 9	1	3.3
	Sartika 14	1	3.3
	Sartika 20	1	3.3

Characteristics Respondent		f	%
	Sartika 22	2	6.7
	Sartika 24	3	10
	Sartika 31	1	3.3
Child's age at measurement:	1 year	13	43.3
	2 years	5	16.7
	3 years	8	26.7
	4 years	4	13.3

From the data above, it can be concluded that as many as 70% of mothers who have 2 children, as many as 53.3% of the respondents came from Posyandu Sartika 4, and the age of the child at the time of measurement was mostly at the age of 1 year at 43.3%.

Table 2.
Frequency Distribution of Respondents based on variables

Variables		Frequency (f)	Percentage (%)
Independent:			
Gender child	Man	14	46.7
	Woman	16	53.3
Mother's education level	Low Education (No school, elementary school, and junior high school)	17	56.7
	Higher Education (High School - Further Education)	13	43.3
Mother's employment status	Doesn't work	24	80
	Work	6	20
Dependents:			
Child Stunting Cases	Stunting	15	50
	No Stunting	15	50

From the data above, it can be concluded that the male gender dominates with a percentage of 46.7%, as many as 56.7% of mothers have a low level of education, and around 80% of the mothers who were respondents did not work.

Table 3.
Statistical test results Gender with Stunting Incidence

Toddler Gender	Stunting				Total		*Asymp.Sig*	*OR*
	Case		Control					
	f	%	f	%	f	%		
Man	7	46.7	7	46.7%	14	46.7	1,000	1
Woman	8	53.3	8	53.3%	18	53.3%		

Based on table 3, it can be seen that a P-value of 1 indicates that there is no relationship between toddler gender and stunting, and an OR of 1 means that the risk of stunting is the same for boys and girls.

Table 4.
Statistical test results Maternal Education Level with Stunting Incidence

Mother's Education Level	Stunting				Total		*Asymp. Sig*	*OR*
	Case		Control					
	f	%	f	%	f	%		
Low Education (No school, elementary school, and middle school)	9	60	8	53.3	17	56.7	0.713	1,313
higher education (High School - Further Education)	6	40	7	46.7	13	43.3		

Based on table 4, it can be seen that the P-value of 0.713 indicates that there is no relationship between maternal education level and stunting, but OR 1.313 indicates a significant relationship. This means that mothers with low education have a 1.313 times higher chance of having stunted children than mothers with high education.

Table 5.
Statistical test results Mother's Employment Status with Stunting Incidence

Mother's Employment Status	Stunting				Total		*Asymp.Sig*	*OR*
	Case		Control					
	f	%	f	%	f	%		
Doesn't work	13	86.7%	11	73.3%	24	56.7%	0.651	2,364
Work	2	13.3%	4	26.7%	6	20%		

Based on table 5, it can be seen that the p-value is 0.651 (>0.05) which means there is no relationship between the mother's employment status and the incidence of child stunting. With an OR value of 2.364 or OR> 1, which means there is a significant relationship between the mother's employment status and the incidence of stunting.

DISCUSSION

Relationship between Toddler Gender and Stunting Incidents

Based on the results of the analysis, a P-value of 1 indicates that there is no relationship between toddler gender and stunting incidents. This is supported by the Odds Ratio (OR) value of 1, which indicates that the risk of stunting is the same for both male and female toddlers. This finding is in line with Samuel in 2022 stunting showed no difference in predictors between boys and girls. several studies that state that biological factors of gender do not directly affect a child's nutritional status, but are more influenced by external factors such as parenting patterns and nutritional intake (Sekarini, 2022). The risk of stunting in male and female toddlers has the same possibility. This is because the toddler period is a golden period of growth, where every toddler needs nutritional intake that is in accordance with their body's needs (Kurniawati & Yulianto, 2022). The findings of this study indicate that children raised in families with suboptimal parenting practices or limited access to nutritious food are at a higher risk of stunting, regardless of gender. Therefore, although biological gender factors do not have a direct impact on stunting prevalence, interventions prioritizing parenting practices, nutritional education, and improved access to healthcare services are crucial in reducing stunting rates. This study highlights the necessity of adopting a holistic approach that considers all environmental factors influencing child growth and development, without differentiating based on gender. In this study, researchers concluded that children raised in families with poor parenting or lack of access to nutritious food have a higher risk of stunting, regardless of gender. Thus, although biological factors of gender do not have a direct impact on the incidence of stunting, interventions that focus on parenting, nutrition education, and increasing access to health services are essential to reduce the prevalence of stunting. This study underscores the need for a holistic approach that considers all aspects of the environment that support toddler growth and development, regardless of gender.

Relationship between Mother's Education Level and Stunting Incidents

The analysis showed a P-value of 0.713, which means there is no statistically significant relationship between mother's education level and stunting incidents. However, the OR value of 1.313 shows that mothers with low education have a 1.313 times higher chance of having stunted children than mothers with higher education. This indicates a relationship, although not statistically significant. Mothers with low education tend to have limited nutritional knowledge, making it difficult to meet their children's nutritional needs properly

(M. Amin et al., 2024). Mothers with higher education tend to have better knowledge about nutrition and child health, which has the potential to reduce the risk of stunting in their children (Ernawati, 2020). The findings in this study indicate that although there was no significant relationship between maternal education level and the incidence of stunting, there are indications that maternal education affects their understanding of nutrition and child health. Mothers with low levels of education are 1.313 times more likely to have children who experience stunting compared to mothers with high education. This study also shows that although maternal education level does not guarantee better knowledge about nutrition, mothers with higher education tend to be more aware of the importance of good nutritional intake for their children. Higher education may provide mothers with greater access to information about healthy eating patterns and child health, which in turn can reduce the risk of stunting in children. The results of this study are in line with research conducted in North Pontianak by Mentari & Hermansyah in 2019 where there was no significant relationship between stunting nutritional status and mother's education level. This is because maternal education does not guarantee more knowledge related to nutrition. In the future, there needs to be more targeted interventions to improve nutrition education and awareness among mothers, especially in areas with a high prevalence of stunting. Nutrition training programs and health education involving the community can be an effective strategy to improve mothers' understanding of the importance of balanced nutrition and good child care (SETIA et al., 2020).

Relationship between Maternal Employment Status and Stunting Incidents

The results of the analysis showed a P value of 0.651, which means that there is no statistically significant relationship between maternal employment status and the incidence of stunting. However, the OR value of 2.364 indicates that children of unemployed mothers have a 2.364 times higher risk of experiencing stunting compared to working mothers. Based on the findings in this study, although there was no statistically significant relationship between maternal employment status and the incidence of stunting, there is an indication that economic factors related to maternal employment affect the risk of stunting in children. Based on the data collected, it was found that unemployed mothers tend to face difficulties in fulfilling balanced nutrition for their children, even though they have more time to care for and nurture their children. This could be due to family economic constraints, which affect the family's purchasing power to buy nutritious food needed by toddlers. In addition, family income is an important factor in fulfilling the nutritional needs of toddlers, especially in families with unemployed mothers, because they tend to rely on one limited source of income. Although unemployed mothers have more time to care for their children, financial constraints can hinder their ability to provide optimal nutrition for their children, which ultimately increases the risk of stunting. As several studies have shown, it is said that economic constraints on unemployed mothers affect the fulfillment of children's nutritional needs, even though unemployed mothers have more time to care for their children (Febrianingsih & Purnomo, 2023). In a study by Laksono et al., in 2022, it was stated that the prevalence of stunting was higher in children with mothers who worked without receiving wages compared to mothers who had lying jobs. Work affects the quality and quantity of food because it is related to income. Families with low incomes have a risk of stunting in children aged 6-24 months up to 8.5 times higher than families with high incomes (Djogo, 2021).

CONCLUSION

Based on the results of the study, no significant relationship was found between the gender of the child and the incidence of stunting. However, the low level of maternal education and the status of mothers who are not working show potential as risk factors for stunting,

although statistically not significant. This finding emphasizes the importance of efforts to improve education and empower the economy of mothers as a strategic step in preventing and reducing the prevalence of stunting, especially in areas that are priority for development.

ACKNOWLEDGEMENTS

The author would like to express his deepest gratitude to the UPTD Gunung Sari Ulu Health Center for the support and permission given during the implementation of this research. Appreciation is also addressed to the respondents who have taken the time to participate and provide valuable data. The author would also like to thank the supervisors, colleagues, and family for the prayers, encouragement, and moral support that have been given throughout the research process and writing of this article.

REFERENCES

Abimayu, A. T., & Rahmawati, N. D. (2023). Analisis Faktor Risiko Kejadian Stunted, Underweight, dan Wasted Pada Balita di Wilayah Kerja Puskesmas Rangkapan Jaya, Kota Depok, Jawa Barat Tahun 2022. *Jurnal Biostatistik, Kependudukan, Dan Informatika Kesehatan*, *3*(2), 88–101.

Amin, M., Salsabilah, M., Pratama, M. I., Salsabila, M., Satria, M. D., & Az-Zahra, B. R. (2024). Strategi pencegahan anemia pada ibu hamil melalui layanan posyandu. *Jurnal Pengabdian Masyarakat Nusantara*, *6*(4), 32–42.

Asnawi, A. A., Maziaturrahmah, M., Handayani, W., & Tanjung, N. U. (2024). Program Pemberian Tablet Tambah Darah Pada Ibu Hamil Dalam Pencegahan Stunting di Sumatera Utara. *Jurnal Kesehatan Tambusai*, *5*(1).

Auliyah, G. G., Utami, B. P., Anantama, Q., Herdiansyah, R. R., Pratama, R. W., Biaggi, M., & Fujilestari, A. (2024). Implementasi Program Keberhasilan Rencana Strategis Dinas Kesehatan Dalam Penurunan Angka Stunting Di Kota Cimahi. *Journal of Social and Economics Research*, *6*(1), 1241–1254.

Dinas Kesehatan Kota Balikpapan. (2022).

Djogo, H. M. A. (2021). Hubungan Pekerjaan Ibu Dan Praktik Asi Ekslusif Dengan Kejadian Stunting Pada Balita Di Kabupaten Timor Tengah Selatan. *Jurnal Kesehatan*, *8*(2), 89–97. https://doi.org/10.35913/jk.v8i2.200

Domili, I., Suleman, S. D., Arbie, F. Y., Anasiru, M. A., & Labatjo, R. (2021). Karakteristik ibu dan pemberian ASI eksklusif dengan kejadian stunting di Kelurahan Padebuolo Kota Gorontalo. *AcTion: Aceh Nutrition Journal*, *6*(1), 25–32.

Ernawati, A. (2020). Gambaran penyebab balita stunting di desa lokus stunting Kabupaten Pati. *Jurnal Litbang: Media Informasi Penelitian, Pengembangan Dan IPTEK*, *16*(2), 77–94.

Febrianingsih, I., & Purnomo, S. D. (2023). Analisis Faktor-Faktor Yang Mempengaruhi Pemenuhan Gizi Keluarga Di Desa Cilopadang Kecamatan Majenang. *Unikal National Conference*, 476–484.

Kurniati, H., Djuwita, R., & Istiqfani, M. (2023). Literature Review: Stunting Saat Balita sebagai Salah Satu Faktor Risiko Penyakit Tidak Menular di Masa Depan. *Jurnal Epidemiologi Kesehatan Indonesia*, *6*(2). https://doi.org/10.7454/epidkes.v6i2.6349

Kurniawati, N., & Yulianto, Y. (2022). Pengaruh Jenis Kelamin Balita, Usia Balita, Status Keluarga Dan Pendapatan Keluarga Terhadap Kejadian Pendek (Stunted) Pada Balita Di Kota Mojokerto. *Pengembangan Ilmu Dan Praktik Kesehatan*, *1*(1), 76–92. https://doi.org/10.56586/pipk.v1i1.192

Laksono, A. D., Sukoco, N. E. W., Rachmawati, T., & Wulandari, R. D. (2022). Factors Related to Stunting Incidence in Toddlers with Working Mothers in Indonesia. *International Journal of Environmental Research and Public Health*, *19*(17). https://doi.org/10.3390/ijerph191710654

Mentari, S., & Hermansyah, A. (2019). Faktor-faktor yang berhubungan dengan status stunting anak usia 24-59 bulan di wilayah kerja UPK puskesmas Siantan Hulu. *Pontianak Nutrition Journal (PNJ)*, *1*(1), 1–5.

Puskesmas Gunung Sari Ulu. (2023).

Ridua, I. R., & Djurubassa, G. M. P. (2020). Kebijakan Pemerintah Kabupaten Halmahera Timur Dalam Menanggulangi Masalah Stunting. *Journal of Social Politics and Governance (JSPG)*, *2*(2), 135–151.

Rusliani, N., Hidayani, W. R., & Sulistyoningsih, H. (2022). Literature Review: Faktor-Faktor yang Berhubungan dengan Kejadian Stunting pada Balita. *Buletin Ilmu Kebidanan Dan Keperawatan*, *1*(01), 32–40. https://doi.org/10.56741/bikk.v1i01.39

Samuel, A., Osendarp, S. J. M., Feskens, E. J. M., Lelisa, A., Adish, A., Kebede, A., & Brouwer, I. D. (2022). Gender differences in nutritional status and determinants among infants (6–11 m): a cross-sectional study in two regions in Ethiopia. *BMC Public Health*, *22*(1), 401.

Savita, R., & Amelia, F. (2020). Hubungan Pekerjaan Ibu, Jenis Kelamin, dan Pemberian Asi Eklusif Terhadap Kejadian Stunting Pada Balita 6-59 Bulan di Bangka Selatan The Relationship of Maternal Employment, Gender, and ASI Eklusif with Incident of Stunting inToddler Aged 6-59 Months. *Jurnal Kesehatan Poltekkes Kemenkes Ri Pangkalpinang*, *8*(1), 6–13.

Sekarini, S. (2022). Kejadian Stunting Pada Balita Ditinjau Dari Karakteristik Umur Dan Jenis Kelamin. *Jurnal Ilmu Kesehatan MAKIA*, *12*(1), 8–12.

Sekretariat BKKBN. (2023). Laporan Pps Sem 1 23. *Laporan Pelaksanaan Percepatan Penurunan Stunting Semester Pertama Tahun 2023*, 2.

SETia, A., Shagti, I., Boroa, R. M., Adi, A. M., Saleh, A., & Amryta, P. (2020). The effect of family-based nutrition education on the intention of changes in knowledge, attitude, behavior of pregnant women and mothers with toddlers in preventing stunting in Puskesmas Batakte. *Kupang Regency, East Nusa Tenggara, Indonesia Working Area. People*, *16*, 48–55.

Setiyawati, M. E., Ardhiyanti, L. P., Hamid, E. N., Muliarta, N. A. T., & Raihanah, Y. J. (2024). Studi Literatur: Keadaan Dan Penanganan Stunting Di Indonesia. *IKRA-ITH HUMANIORA: Jurnal Sosial Dan Humaniora*, *8*(2), 179–186.

Sutopo, B., & W, R. D. T. (2021). Penyuluhan Pencegahan Stunting dan Pendampingan Parenting bagi Masyarakat Desa Ketro. *Jurnal Abdidas*, *2*(6), 1301–1310. https://doi.org/10.31004/abdidas.v2i6.470

Syahruddin, A. N., Ningsih, N. A., & Menge, F. (2022). Hubungan kejadian stunting dengan perkembangan anak usia 6-23 bulan. *Poltekita: Jurnal Ilmu Kesehatan*, *15*(4), 327–332.

Winowatan, G., Malonda, N. S. H., & Punuh, M. I. (2017). Hubungan antara berat badan lahir anak dengan kejadian stunting pada anak batita di wilayah kerja puskesmas sonder kabupaten Minahasa. *Kesmas*, *6*(3).