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Stunting and its Determinant Factors Among Children Under Five in North Maluku Province in 2021-2023

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ABSTRACT

The occurrence of stunting has become one of the global health challenges, especially in developing countries. The average prevalence of stunting in North Maluku province from 2021 to 2023 is around 24.9% for children under 5 years old. Stunting is a nutritional problem caused by multiple factors. Factors suspected to influence the occurrence of stunting include the diversity of food consumption and food security. Food diversity can be described through the expected food patterns score, while food security can be measured using the food security index indicator. The purpose of this research is to identify the factors causing stunting in North Maluku province from 2021 to 2023. This study uses a *cross-sectional* design with secondary data sources. Data analysis used *Pearson and Spearman correlation* as well as multiple linear regression tests. The results of the *bivariate* data analysis show that the average years of schooling for women (P<0.001) and the ratio of healthcare workers (P<0.001) are significantly related. As for the desirable dietary patterns (P=0.426), the population below the poverty line (P=0.142), food expenditure >65% (P=0.822), lack of access to electricity (P=0.177), lack of access to clean water (P=0.833), and life expectancy (P=0.110), these are variables that do not have a significant relationship. The multivariate analysis results show that the p-*value* for the average years of schooling for women is 0.005 and the healthcare worker ratio is 0.004. Thus, it can be concluded that there is a significant influence between the average years of schooling for women and the ratio of healthcare workers on the incidence of stunting in children in North Maluku province from 2021 to 2023.

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Introduction

Nutritional fulfilment is a fundamental aspect that is important in human life. To meet quality intake as an enhancement of human resources. The inadequacy in meeting nutritional needs has significant impacts, one of which is currently the focus worldwide: the prevalence of stunting (Ministry of Health of the Republic of Indonesia, 2023). Stunting is a measurement that describes the children height score being lower than their age through the calculation of weight to height. (World Health Organization, 2024).

The occurrence of stunting has become one of the global health challenges, especially in developing countries. At least nearly one in three people worldwide experience malnutrition, specifically stunting. According to the UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates (World Health Indonesia, 2024), in 2022, it is estimated that 22.3% or approximately 148.1 million children under the age of 5 experienced stunting. Indonesia has a stunting prevalence rate of 21.5% in 2023 for children under 5 years old, which means about one in five children in Indonesia experience stunting. The average incidence of stunting in North Maluku province from 2021-2023 is around 24.9% for children under 5 years old (Food Security and Vulnerability Atlas, 2023). Both nationally and in North Maluku province, the stunting rate remains in the high category, which is 20-29% (World Health Organization, 2024).

Several studies that have been conducted found that the impact caused by stunting increases the risk of decreased academic achievement in children, raises the incidence of obesity in adulthood, makes the body more susceptible to diseases, and leads to degenerative diseases (Khan S *et al*., 2019). One of the pillars in the prevention and handling of stunting by the stunting reduction acceleration team is nutrition and food security (Ministry of State Secretariat of the Republic of Indonesia, 2020).

In terms of nutrition, the prevention measures taken include providing nutritious and varied foods, aimed at increasing food intake, especially complete nutrition for children. The diversity of food consumption can be seen in the Desirable Dietary patterns (DDP) score. DDP has a compositional meaning that, when consumed, can meet daily needs (including energy and other nutrients) (Suratri *et al.*, 2023). With an approach to the quality of food consumption among the population at the regional level through the PPH score, it becomes a social transformation from a health aspect towards the Golden Indonesia 2045. (National Food Agency, 2024). Research conducted by Rohamawati *et al*., (2022) found that a low DDP score has a risk of 1.02 times for stunting incidents in Sumberjambe district. In 2023, the DDP score in North Maluku Province was 77.8%, still far below the RPJMN 2023 target of 94%. (National Food Agency, 2023).

In the aspect of food security, it can be measured through the food security index. Food security describes the condition of having sufficient food available in terms of both quantity and quality, safe, varied, nourishing, widely available, reasonably priced, and not in opposition to the local population's or individuals' culture, religion, or beliefs. (National Food Agency, 2023). indirectly, the occurrence of stunting can be influenced by food security (Jumariati *et al*., 2019). In 2023, six out of ten regencies/cities in North Maluku Province still into the vulnerable and somewhat vulnerable food security category. (Food Security and Vulnerability Atlas, 2023). This sufficiently explains that the increase in stunting cases is also due to food insecurity, especially in the province of North Maluku.

Based on the above description, the prevalence of stunting in North Maluku province is still very common, and there are few studies examining the factors determining stunting in North Maluku province. Therefore, there is a need for research to identify other factors influencing the occurrence of stunting, one of which is the DDP score and indicators in the food security index in North Maluku province from 2021-2023.

Method

This research uses secondary data obtained from the website and the FSVA (Food Security and Vulnerability Atlas) books from 2021-2023, as well as the 2023 Food Consumption Directory Book for Districts/Cities in the Nusa Tenggara, Sulawesi, Maluku, and Papua regions. This research employs a cross-sectional design with secondary data sources. The population and sample consist of regencies and cities in North Maluku province from 2021-2023, total 30 samples.

The dependent variable used in this study is stunting. Then, the independent variables used in this study are the Desirable dietary patterns, the population below the poverty line, food expenditure >65%, without access to electricity, without access to clean water, average years of schooling for women, healthcare worker ratio, and life expectancy. The data analysis process was conducted using *SPSS* Version 26 software.

The analysis techniques used in this study are univariate analysis (descriptive analysis), bivariate analysis (relationship analysis), and multivariate analysis (effect analysis).

Univariate analysis aims to understand the characteristics of each research variable using measures of central tendency and data dispersion. (Harsono *et al*., 2024). Bivariate analysis in this study uses *Pearson and Spearman correlation tests*. The *Pearson correlation test* is a measure of the linear relationship between two normally distributed random variables, where H0 is rejected (p-*value*<0.05) indicating a significant relationship between the independent and dependent variables. The *Spearman correlation test*, on the other hand, is a measure of the linear relationship between two non-normally distributed random variables, where H0 is accepted (p-*value*>0.05) indicating no significant relationship between the independent and dependent variables (Schober *et al*., 2018).

Multivariate analysis in this study uses *Multiple linear regression analysis*. The type of *linear regression* analysis used is *multiple linear regression*, which is an extension of *simple linear regression* to examine the effects of several independent variables on one dependent variable (Trunfio *et al*., 2022).

The assumptions that must be met before conducting *multiple linear regressio*n analysis are classical assumption tests aimed at examining the feasibility of the regression model used. Classical assumption tests include: (a) The residual normality test is Metric that quantifies the linear correlation between two randomly distributed, normally distributed variables. To determine if the residual values generated by the regression are regularly distributed or not, the residual normality test is utilized. If the residual values of a regression model are regularly distributed, it is seen to be good (Priyatno, 2022). (b) The heteroscedasticity test aims to test seeks to determine whether a regression model exhibits residuals or variance inequality between observations. (Maesaroh *et al*., 2022). (c) The Multicollinearity Test aims to determine the correlation between variables. Independent variables should not be correlated with each other. If this assumption is not met, a condition known as multicollinearity occurs. This condition is detected through the Value of the Variance Influence Factor. (VIF). The null hypothesis (H0) is rejected if the VIF value is greater than 10. (Mufidah *et al*., 2023). (d) The Autocorrelation Test aims to determine whether the model obtained from linear regression has a correlation between the disturbance errors in the data. If autocorrelation occurs, then the equation is not suitable for use as a prediction. If the autocorrelation value through *Durbin-Watson* is between -2 and 2, then there are no signs of autocorrelation (Terimajaya *et al*., 2024).

The results of the *multiple linear regression* analysis yield the coefficient of determination (R-square value). The R-square is percentage of the dependent variable's variation that can be accounted for by the

independent variables is shown by the R-squared value (Leon *et al.,* 2023). *Multiple linear regression* analysis uses two tests, namely the F test (simultaneous test) and the t test (partial test). The F test is conducted to test the overall regression model, which is to see whether the independent variables together can influence the dependent variable (Herminingsih & Rahayu, 2024). The t test is conducted to see the significance level or the influence given by each independent variable on the dependent variable (Nursiyono & Nadeak, 2016).

Results

Univariate Analysis

Descriptive statistic for the research variables' mean, median, standard deviation, minimum-maximum, and 95% confidence interval are displayed in table 1. The independent variables in this study are the desirable dietary pattern (DDP), Population below the poverty line (POV), food expenditure >65% (food), lack of access to electricity (elect), lack of access to clean water (water), average years of schooling for women (school), healthcare workers ratio (health), and life expectancy (life), with stunting as the dependent variable.

Table 1. Descriptive Statistic

Variable	Mean	Median	SD	Min – Max	95% CI
Desirable Dietary Patterns (DDP)	74.23	75.90	7.48	56.90 – 86.90	71.43 – 77.02
Population below the poverty line (POV)	7.74	6.73	3.48	3.11 – 15.45	6.44 – 9.03
Food Expenditure >65% (Food)	13.92	13.56	6.91	1.75 – 33.33	11.34 – 16.50
Lack of Access to Electricity (Elect)	3.68	1.58	6.11	0.00 – 23.87	1.40 – 5.96
Lack of Access to Clean Water (Water)	36.40	37.82	12.43	5.95 – 56.98	31.76 – 41.04
Average Years of Schooling for Women (School)	9.39	9.12	1.25	7.63 – 11.82	8.92 – 9.86
Healthcare workers ratio (Health)	3.59	2.93	3.58	0.01 – 10.79	2.25 – 4.92
Life Expectancy (Life)	66.93	66.91	2.87	62.10 – 71.38	65.86 – 67.99
Stunting	24.19	24.45	7.14	10.40 – 35.20	21.52 – 26.85

The average and standard deviation of DDP, POV, food, elect, water, school, health, life, and stunting are 74.23 ± 7.48; 7.74 ± 3.48; 13.92 ± 6.91; 3.68 ± 6.11; 36.40 ± 12.43; 9.39 ± 1.25; 3.59 ± 3.58; 66.93 ± 2.87; and 24.19 ± 7.14. The minimum value for DDP is 56.90 with the maximum value 86.90; the minimum value for POV is 3.11 with the maximum value 15.45; the minimum value for food is 1.75 with the maximum value 33.33; the minimum value for elect is 0.00 with the maximum value 23.87; the minimum value for water is 5.95 with the maximum value 56.98; the minimum value for school is 7.63 with the maximum value 11.82; the minimum value for health is 0.01 with the maximum value 10.79; the minimum value for life is 62.10 with the maximum value 71.38; and the minimum value for stunting is 10.40 with the maximum value 35.20.

Bivariate Analysis

Pearson and Spearman tests are used for bivariate analysis, depending on the normality of the data. Bivariate analysis is used to examine the relationship between each independent and dependent variable. Variables that are related in the bivariate analysis (*p-value* <0.05) will be further examined using multiple linear regression in multivariate analysis.

The results of the bivariate analysis using *Pearson and Spearman correlation* tests indicate that the average years of schooling for women and healthcare workers ratio have significant relationship (*p-value* <0.05) with the incidence of stunting among children under five in North Maluku Province from 2021 to 2023. Meanwhile, the variables of expected food consumption patterns, the population below the poverty line, food expenditure >65%, lack of access to electricity, and lack of access to clean water are variables that do not have a significant relationship (*p-value* > 0.05) with the incidence of stunting among children under five in North Maluku Province from 2021 to 2023.

Table 2. *Pearson and Spearman* test on Dependent dan Independent Variables

Variable	Correlation Value	p-Value
DDP	-0.151	0.426
POV	0.275	0.142
Food	-0.043	0.822
Elect	0.253	0.177
Water	0.040	0.833
School	-0.780	<0.001*
Health	0.822	<0.001*
Life	-0.298	0.110

*) significant

Multivariate Analysis

The classical assumptions must be met before conducting multiple linear regression analysis: residual normality test, autocorrelation test, heteroscedasticity test, and multicollinearity test (Priyatno, 2022). The residual normality test using *Shapiro-Wilk* showed *p-value*=0.325 (p>0.05), which means the residual values produced in this study are normally distributed. The results of the autocorrelation test using the *Durbin-Watson* test showed a value 1.86, which means there is no autocorrelation. The significance values in the heteroscedasticity test for the average years of schooling for women and the healthcare worker ratio are 0.367 and 0.106, indicating that there are no signs of heteroscedasticity (p-value > 0.05). The Variance Influence Factor (VIF) values in the multicollinearity test for the average years of schooling for women and the healthcare worker ratio are 2.012 and 2.012, indicating that there is no

multicollinearity (VIF < 10) or the two independent variables are not correlated with each other.
All classical assumptions are met so the linear regression model can be declared feasible. The multiple linear regression test in this study showed an R-square value of 0.715, which means that 71.5% of the variation in stunting prevalence among children under five in North Maluku Province from 2021 to 2023 can be explained by the combination of the average years of schooling for women and the healthcare worker ratio, while 28.5% is attributed to other factors that not included in the model. The F-test in this study produced an F value of 33.95 with a p-value <0.001, that can be concluded that simultaneously, the average years of schooling for women and the ratio of healthcare workers have an impact on the incidence of stunting among children under five in North Maluku Province from 2021 to 2023.

Table 3. Multivariat Analysis of Multiple Linear Regression

Variable	*B*	*t*	*p-Value*
Constant	44.89	5.22	<0.001
School	-2.56	-3.09	0.005*
Health	0.93	3.20	0.004*

*) significant

Table 3 presents the *t-test* results for the average years of schooling for women and healthcare workers ratio with p-values of 0.005 and 0.004 ($p<0.05$), which means that each of these independent variables affects the incidence of stunting among children under five in North Maluku Province from 2021 to 2023. The multiple regression model for the incidence of stunting among children under five in North Maluku Province from 2021 to 2023 is as follows:

$$Y = 44.89 - 2.56X_1 + 0.93X_2 + \varepsilon$$

Discussion

According to multivariate analysis, the average length of education of women in North Maluku Province has a significant impact on the incidence of stunting from 2021 to 2023, with a regression coefficient of -2.56 and a (*p-value*=0.005). This indicates that the prevalence of stunting will decrease by 2.56 for every increase in maternal education. This study supports the finding by Chowdhury *et al*., (2016) that the prevalence of stunting is influenced by the length of maternal education. One of the key determinants of a child's growth and development is the mother. Low-educated mothers are more likely to make poor judgments and perform activities that affect their children's health, particularly when it comes to nutrition and health (Khan *et al*., 2019).
A woman or mother who has good education, especially related to nutrition, will tend to pay more attention to the health and growth of children appropriately because of decision-making in providing nutritious food and also pay attention to the suitability of proper feeding in each phase or age of the child as a prevention of stunting.
With the goal of raising public awareness of the significance of high education for women in preventing stunting in the long run, the findings of this study conducted in North Maluku Province can undoubtedly be a significant concern for community organizations and local government education departments. In the short term, nutrition education combined with support for expectant and nursing moms can help avoid stunting. The necessity of exclusive breastfeeding, complementary foods, and the Clean and Healthy Living Guidelines' tenets—which must be followed to shield kids from infectious diseases—can all be used as teaching tools.
Another factor causing stunting that has a significant effect in North Maluku Province is the ratio of health workers (*p-value*=0.004) with a regression coefficient of 0.929. This means that the higher the ratio of health workers in North Maluku Province will increase the incidence of stunting by 0.929.
The findings of this significance are consistent with Lestari's (2020) research, which shows that the incidence of stunting would be impacted by the relationship between high health worker support. Ginting's research (2020), which claims that stunting prevention measures are still weak because health workers have not performed their jobs to the best of their abilities, provides additional support research.
Being communicators, motivators, and facilitators of the community's access to good health makes health workers a vital part of the community. Effendy and Tjahjono (2020) also expressed the similar idea, namely that health professionals' main responsibility is to monitor, assess, and provide input on all aspects of health in the hopes of supplying the family with information for their monitoring. In addition to direct home visits, this monitoring may involve presenting community members with information on health-related issues.
Other variables in the food security indicator and also the DDP value are not proven to be a factor in causing stunting in North Maluku Province from 2021-2023. This can happen because these variables are not a direct factor in supporting the cause of the increase in stunting incidence.

Conclusion

The average years of schooling of women and the ratio of health workers are factors that cause an increase in the incidence of stunting in toddlers in North Maluku Province from 2021 - 2023. Stunting is less common among women with higher levels of education. Another risk factor for stunting in North Maluku Province is the proportion of health workers. In order to encourage the improvement of stunting in North Maluku Province, it is vital to recognize the increased improvement from this side. Other indicator variables as well as DDP are not proven to be causal factors for the incidence of stunting in North Maluku Province from 2021 - 2023. The addition of a year range can be done for further research to see the effect of food security index indicators on the incidence of stunting.

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References

Badan Pangan Nasional. (2024). *Pedoman Penilaian Skor Pola Pangan Harapan (B2SA)*. Badan Pangan Nasional.

Badan Pangan Nasional. (2023). Perkuat Instrumen Ketahanan Pangan, Badan Pangan Nasional Terbitkan Beleid Pola Pangan Harapan. Tersedia pada www.badanpangan.go.id.

Badan Pangan Nasional. (2023). *Peta Ketahanan dan Kerentangan Pangan: Food Security and Vulnerability Atlas 2023 (Data Indikator Tahun 2022).* Badan Pangan Nasional.

Chowdhury, M. R. K., Rahman, M. S., Khan. M. M. H., Mondal M. N. I., Rahman, M. M., Billah, B. (2016). Risk Factors for Child Malnutrition in Bangladesh: A Multilevel Analysis of a Nationwide Population-Based Survey. *The Journal of Pediatrics,* 172(1), 194-201.el. https://doi.org/10.1016/j.jpeds.2016.01.023

Effendy, R. W., dan Tjahjono, E. (2000). Hubungan Antara Perilaku Coping dan Dukungan Sosial dengan Kecemasan Pada Ibu Hamil Anak Pertama. *Jurnal Anima,* 14, 214-227.

Ginting, P. Y. (2020). Program Penanggulangan Stunting di Wilayah Kerja Puskesmas Tangkahan Durian Kecamatan Brandan Barat Kabupaten Langkat Tahun 2018. [Skripsi, Universitas Sumatera Utara].

Mufidah, I. M., Basuki, H.(2023). Analisis Regresi Linier Berganda untuk Mengetahui Faktor yang Mempengaruhi Kejadian Stunting di Jawa Timur. *Indonesia Nursing Journal of Education and Clinic*. 3(3) : 51-59. ISSN: 2527-8819.

Jung H., Jung, H. U., Baek, E. U., Chung, J. Y., Kwon, S.Y., Kang, J.O., Lim, J. E., Oh B., (2023). Investigation of Heteroscedasticity in Polygenic Risk Scores Across 15 Quantitative Traits. *Front. Genet.* 14 : 1-14. doi: 10.3389/fgene.2023.1150889.

Jusuf, H., Adityaningrum, A., Yunus, R. (2022). Determinan Kejadian Gastritis Pada Mahasiswa. JAMBURA Health and Sport Journal. 4(2) : 108-118. https://doi.org/10.37311/jhsj.v4i2.15171

Harsono, I., Wonar, K., Desviona, N., Utama, R. C., Masruroh, M., Damayanti, I. D., Andrini, V. S., Rospida, L., Salle, H. T., Wati, D. C., Naufal, N., Duma', S. Y., & Matsaany, B. (2024). *Buku Ajar Metode Statistika 1*. Sonpedia Publishing Indonesia.

Herminingsih, A., & Rahayu, L. D. (2024). *Manajemen Kesiapan Organisasi untuk Peubah*. Bintang Semesta Media.

Khan, S., Zaheer, S., Safdar, N. F. (2019). Determinants of Stunting, Underweight and Wasting Among Children <5 Yeard of Age: Evidence From 2012-2013 Pakistan Demographic and Health Survey. *BMC Public Health*, 19(358): 2-15. https://doi.org/10.1186/s12889-019-6688-2.

[KEMENSETNEG] Kementerian Sekretariat Negara Republik Indonesia. (2020). *Tim Percepatan Penurunan Stunting/TPPS*. Tersedia Pada www.stunting.go.id.

Lestari, S. (2020). Determinan Pemberian ASI Eksklusif Pada Balita Stunting di Wilayah Kerja Puskesmas Sepulu. [Skripsi, STIKES Ngudia Husada Madura].

Leon, F. M., Suryaputri, R. V., & Purnamaningrum, T. K. (2023). *Metode Penelitian Kuantitatif: Manajemen, Keuangan, dan Akuntansi*. Salemba Empat.

Maesaroh, Zubadi, H., Pramesti, D.A. (2022). Pengaruh Likuiditas, Profitabilitas, Leverage dan Ukuran Perusahaan Terhadap Harga Saham pada Perusahaan Manufaktur yang Terdaftar di BEI (Studi Empiris pada Perusahaan Tambang yang Terdaftar di BEI 2017-2020). *UNIMMA Journal*, 508-514. eISSN: 2828-0725.

Nursiyono, J. K., & Nadeak, P. P. H. (2016). *Setetes Ilmu Regresi Linier*. MNC Publishing.

Priyatno, D. (2022). *Olah Data Sendiri Analisis Regresi Linier dengan SPSS dan Analisis Regresi Data Panel dengan Eviews*. Cahaya Harapan.

Rohmawati, N., Hidayati, M. N., Jannah, M. (2022). Hubungan Skor Pola Pangan Harapan (PPH) dengan Kejadian Stunting Pada Balita Usia 24-59 Bulan. *Jurnal Nutrisia*. 24(1) : 8-15.

Schober, Patrick, Boer, Christa, Shcwarte, Lothar, A. (2018). Correlation Coefficients: Appropriate Use and Interpretation. International Anesthesia Research Society. 126(5): 1763-1768.
DOI: 10.1213/ANE.0000000000002864.

Suratri, M. A. L., Putro, G., Rachmat, B., Nurhayati., Ristrini., Pracoyo, N. E., Yulianto, A., Suryatma, A., Samsudin, M., Raharni. (2023). Factors for Stunting among Children under Five Years in the Province of East Nusa Tenggara (NTT), Indonesia. *Int. J. Environ. Res. P Public Health*, 20, 1640. https://doi.org/10.3390/ ijerph20021640

Terimajaya, I. W., Dewi, N. L. S., Simamora, T., Judijanto, L., Sigamura, R. K., Nurhayati, Kusumastuti, S. Y., Bahana, R., Laka, L., Permatasari, A. H., Salma, A., Sudarsani, N. P., Ardiansyah, & Basri. (2024). *Dasar-dasar Statistika (Konsep dan Metode Analisi)*. Sonpedia Publishing Indonesia.

Trunfio, T. A., Scala, A., Giglio, C., Rossi, G., Borreli, A., Romano, M., Improta, G. (2022). Multiple Regression Model to Analyze the Total LOS for Patients Undergoing Laparoscopis Appendectomy. Medical Informatics and Decision Making. 22:2-8.

https://doi.org/10.1186/s12911-022-01884-9

United Nations Children's Fund (UNICEF), World Health Organization, International Bank for Reconstruction and Development/The World Bank. (2020). *Levels and trends in child malnutrition: Key Findings of the 2020 Edition of the Joint Child Malnutrition Estimates.* Geneva: World Health Organization.

[WHO] World Health Organization. (2024). *Joint Child Malnutrition Estimates*. World Health Statistics : WHS.

[FSVA] Food Security and Vulnerability Atlas. Indeks Ketahanan & Kerentanan Pangan [Internet]. Tersedia pada www.fsva.badanpangan.go.id

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