


Factors Associated with the Incidence of Stunting in Children Aged 24-59 Months at UPTD Sangurara Public Health Center, Palu City, in 2023

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ARTICLE INFO	ABSTRACT
Article History: Received Accepted Published online	<i>Stunting and underweight were nutrition problem in children under five which is caused by multiple factors Objective: This study aimed to know factors related to stunting and underweight among children under five in working area of public health center of Busalangga. Method: This cross-sectional study involved 293 children under-five, sampled technique with stratified random sampling. Continuity Correction and Pearson Chi-Square were used to analyse the relationship between variables. Result: Factors related to stunting and underweight: age of mother when first pregnancy (p:0,000), birth weight (p:0,000), exclusive breastfeeding (p:0,000), aged to introduce complementary feeding (p:0,000), type and textures of first complementary feeding (p:0,000), toddlers with history of infectious diseases (p:0,000), and mother's behaviour {hand washing} (p:0,000). Factors just related to underweight: maternal education (p:0,003), health problems during pregnancy (p:0,003), early initiation of breastfeeding (p:0,001), colostrum (p:0,024) Conclusion and suggestions: Factors related to stunting and underweight: age of mother when first pregnancy, birth weight, exclusive breastfeeding, aged to introduce complementary feeding, type and textures of first complementary feeding, toddlers with history of infectious diseases, and mother's behaviour (hand washing). Factors just related to underweight: maternal education, health problems during pregnancy, early initiation of breastfeeding and colostrum. Therefore, health workers in the future need to be concerned to improve the program about prevention stunting and underweight.</i>
Keywords: Risk Factors; Stunting; Toddler; This is an open access article under the  CC-BY-SA license.	

INTRODUCTION

Stunting is a growth disorder due to malnutrition that occurs in children under five years old.¹ Stunting is also defined as a condition in which a child's body is short or very short based on the length-for-age (LAZ) or height-for-age (HAZ) index, with a threshold (z-score) between -3 SD and < -2 SD.²

Children are categorized as stunted if their length/height is less than -3 SD from the median child growth standard.³

For the same age and sex category, stunting begins as early as the fetal stage and only becomes apparent when the child reaches two years of age.⁴

There are many factors influencing the incidence of stunting in a particular region, including the level of knowledge, attitudes, availability of health facilities and infrastructure, as well as the form of family support. Knowledge is closely related to education, where it can be defined that a person with a higher level of education tends to have broader knowledge, and vice versa. A mother's level of nutritional knowledge will affect her child's nutritional status. Mothers with low knowledge levels can contribute to the incidence of stunting in toddlers. However, having a low level of formal education does not necessarily mean a mother lacks sufficient knowledge about her family's health and well-being.⁵

According to the 2018 Basic Health Research in Indonesia, the prevalence of stunting was 30.8%. Stunting prevalence remains a public health problem if it is 20% or higher. In 2021, the prevalence of stunting among children under five in Central Sulawesi was 29.7%. Stunting prevalence occurs in several districts within Central Sulawesi. The highest incidence of stunting was found in Sigi District at 40.74%, while the lowest was in Palu City with a prevalence of 23.9%. Stunting in Palu City is still considered a public health problem because, according to WHO standards, stunting is classified as a problem if its prevalence is 20% or higher.⁶

Data obtained by the researcher from the Palu City Health Office recorded several cases of stunting. The highest incidence of stunting was found at Pantoloan Health Center with a prevalence of 20.92%, and the lowest at Kamonji

Health Center with a prevalence of 1.16%. The Sangurara Health Center area ranked second highest after Pantoloan Health Center, with a prevalence of 18.7%. Stunting data in the Sangurara area showed prevalence rates of 4.76% in Nunu Sub-district, 5.88% in Duyu Sub-district, 53% in Boyaoge Sub-district, 3.95% in Balaroa Sub-district, and 6.15% in Donggala Kodi Sub-district.⁶

Based on the information above, the research problem in this study is: the factors associated with the incidence of stunting among children aged 24-59 months in the working area of UPTD Sangurara Public Health Center, Palu City, in 2023.

The general objective of this study is expected to identify the factors associated with the incidence of stunting among children aged 24-59 months in the working area of UPTD Sangurara Public Health Center, Palu City, in 2023.

MATERIAL AND METHOD

Data Collection Method

This study employed an observational research design with a cross-sectional approach, aiming to examine the factors associated with the incidence of stunting among children under five in the working area of UPTD Sangurara Public Health Center, Tatanga District, Palu City.

Population and Sample

The population in this study consisted of all mothers who have children aged 24-59 months in the working area of UPTD Sangurara Public Health Center, Palu City, over the past year (2022), totaling 832 children. The sample in this study was taken proportionally to represent the entire population. The sample size in this study was 76 mothers with children under five.

Research Location and Study Design

The research was conducted in the working area of UPTD Sangurara Public Health Center, Tatanga District, located on Jl. Pomandu, Duyu, Tatanga District, Palu City, Central Sulawesi. This study used a cross-sectional approach to examine factors associated with the incidence of stunting among children under five.

Data Analysis

The responses from the questionnaire regarding factors associated with the incidence of stunting were entered into Microsoft Excel. Data processing was carried out using the SPSS version 26.0 computer software.

RESULTS AND DISCUSSIONS

Table 1. The Relationship Between Maternal Education Level and the Incidence of Stunting Among Children Under Five in the Working Area of UPTD Sangurara Public Health Center in 2023

No	Maternal Education Level	Stunting		Non-Stunting		Total		P-Value
		n	%	n	%	n	%	
1	Low	15	19.7	17	22.4	32	42.1	1.000
2	High	20	26.3	24	31.6	44	57.9	
	Total	35	55.2	41	44.7	76	100	

Based on Table 1, the relationship between maternal education level and stunting cases among children under five shows that out of 32 respondents (42.1%) with a low education level, 15 respondents (19.7%) experienced stunting, while 17 respondents (22.4%) did not. Meanwhile, among 44 respondents (57.9%) with a high education level (\geq senior high school), 20 respondents (26.3%) experienced stunting, and 24 respondents (31.6%) did not.

Table 2. The Relationship Between Maternal Knowledge Level and the Incidence of Stunting Among Children Under Five in the Working Area of UPTD Sangurara Public Health Center in 2023.

No	Maternal Knowledge Level	Stunting		Non-Stunting		Total		P-Value
		n	%	n	%	n	%	
1	Poor	8	10.5	22	28.9	30	39.5	0.01
2	Good	27	35.5	19	25.0	46	60.5	
	Total	35	46.1	41	53.9	76	100	

Based on Table 2, the relationship between maternal knowledge level and stunting cases among children aged 24-59 months shows that, out of the 76 respondents in this study, 30 respondents (39.5%) had low knowledge regarding stunting, while 46 respondents (60.5%) had good knowledge. Among the 30 respondents with low knowledge, 8 (10.5%) experienced stunting, while 22 (28.9%) did not experience stunting and had good nutritional status. Among respondents with good knowledge, 27 (35.5%) experienced stunting, and 19 (25%) did not.

Table 3. The Relationship Between Early Marriage and the Incidence of Stunting Among Children Under Five in the Working Area of UPTD Sangurara Public Health Center

No	Early Marriage	Stunting		Non-Stunting		Total		P-Value
		n	%	n	%	n	%	
1	Poorly	26	34.2	15	19.7	41	53.9	0.02
2	Good	9	11.8	26	34.2	35	46.1	
	Total	35	46.1	34	41	76	100	

Based on Table 3, the relationship between early marriage and the incidence of stunting among children under five shows that, out of 76 respondents in this study, 41 respondents (53.9%) were categorized as having unfavorable early marriage status, while 35 respondents (46.1%) were categorized as favorable. Among the 41 respondents with unfavorable early marriage status, 26 respondents (34.2%) had children who experienced stunting, while 15 respondents (19.7%) had children who did not experience stunting. Meanwhile, among the 35 respondents with favorable early marriage status, 15 respondents (19.7%) had children who experienced stunting, and 20 respondents (26.3%) had children who did not experience stunting.

Table 4. The Relationship Between Family Dietary Patterns and the Incidence of Stunting Among Children Under Five at UPTD Sangurara Public Health Center

No	Dietary Pattern	Stunting		Non-Stunting		Total		P-Value
		n	%	n	%	n	%	
1	Sufficient	36	62.2	22	37.9	58	39.5	0.11
2	Not Sufficient	6	33.3	12	66.6	18	60.5	
Total		42	55.2	34	44.7	76	100	

Based on Table 4, the relationship between family dietary patterns and the incidence of stunting among children under five shows that, out of 76 respondents in this study, 58 respondents (76.3%) had inadequate dietary patterns, while 18 respondents (23.7%) had adequate dietary patterns. Among the 58 respondents with inadequate dietary patterns, 36 respondents (62.0%) had children who experienced stunting, while 22 respondents (37.9%) had children who did not experience stunting. For respondents with adequate family dietary patterns, 6 respondents (33.3%) had children who experienced stunting, while 12 respondents (66.6%) had children who did not experience stunting.

Table 5. The Relationship Between Parenting Patterns and the Incidence of Stunting Among Children Under Five at UPTD Sangurara Public Health Center

No	Parenting Patterns	Stunting		Non-Stunting		Total		P-Value
		n	%	n	%	n	%	
1	Poor	23	30.3	11	14.5	34	44.7	0.002
2	Good	12	15.8	30	39.5	42	55.3	
Total		35	46.1	31	53.9	76	100	

Based on Table 5, the relationship between parenting patterns and the incidence of stunting among children under five shows that, out of the 76 respondents in this study, 34 respondents (44.7%) practiced poor parenting, while 42 respondents (55.3%) practiced good parenting. Among the 34 respondents with poor parenting patterns, 23 respondents (30.3%) had children who experienced stunting, while 11 respondents (14.5%) had children who did not experience

stunting and had good nutritional status. Among the 42 respondents with good parenting patterns, 12 respondents (15.8%) had children who experienced stunting, while 30 respondents (39.5%) had children who did not experience stunting

Table 6. The Relationship Between Family Income and the Incidence of Stunting Among Children Under Five at UPTD Sangurara Public Health Center

No	Family Income	Stunting		Non-Stunting		Total		P-Value
		n	%	n	%	n	%	
1	Poor	24	31.6	15	19.7	39	51.3	0.01
2	Good	11	4.5	26	34.2	37	48.7	
Total		35	46.1	41	53.9	76	100	

Based on Table 6, the relationship between family income and the incidence of stunting among children under five shows that, out of the 76 respondents in this study, 39 respondents (51.3%) had low family income, while 37 respondents (48.7%) had good family income. Among the 39 respondents with low family income, 24 respondents (31.6%) had children who experienced stunting, while 15 respondents (19.7%) had children who did not experience stunting. Among the 37 respondents with good family income, 11 respondents (14.5%) had children who experienced stunting, while 26 respondents (34.2%) had children who did not experience stunting.

DISCUSSION

Relationship Between Education Level and Stunting Cases

Table 1 shows that, out of 32 respondents (42.1%) with a low level of education and 44 respondents (57.9%) with a high level of education, 15 respondents (19.7%) among those with low education experienced stunting cases, while 17 respondents (22.4%) did not experience stunting. Meanwhile, among the 44 respondents (57.9%) with a higher education level (\geq senior high school), 20 respondents (26.3%) experienced stunting cases, and 24

respondents (31.6%) did not experience stunting.

The results of statistical analysis using the Chi-Square test showed a p-value of 1.000, meaning $P > 0.05$. Therefore, the alternative hypothesis (H_a) is rejected, and the null hypothesis (H_0) is accepted. It can be concluded that there is no significant relationship between maternal education level and the incidence of stunting among children under five.

Relationship Between Knowledge Level and Stunting Cases

Based on Table 2, the results show the distribution of stunting cases among the 76 respondents in this study. A total of 30 respondents (39.5%) had low maternal knowledge related to stunting, while 46 respondents (60.5%) had good knowledge. Among the 30 respondents with low knowledge, 8 respondents (10.5%) had children who experienced stunting, while 22 respondents (28.9%) did not experience stunting and had good nutritional status. Among the respondents with good knowledge, 27 respondents (35.5%) had children who experienced stunting, while 19 respondents (25.0%) did not experience stunting.

The results of the statistical analysis using the Chi-Square test showed a p-value of 0.01, meaning $P < 0.05$. Therefore, it can be concluded that there is a significant relationship between maternal knowledge and the incidence of stunting among children under five.

Relationship Between Early Marriage and Stunting Cases

Based on Table 3, the percentage results of this study show the distribution of stunting cases among the 76 respondents. Of these, 41 respondents (53.9%) were categorized as having unfavorable early marriage status, while 35 respondents (46.1%) were categorized as having favorable early marriage status. Among the 41 respondents with unfavorable early marriage status, 26 respondents (34.2%) had children who experienced stunting, while 15 respondents (19.7%) had children who did not experience stunting. Among the 35 respondents with favorable early marriage status, 15

respondents (19.7%) had children who experienced stunting, and 20 respondents (26.3%) had children who did not experience stunting.

The results of the statistical analysis using the Chi-Square test showed a p-value of 0.02, meaning $P < 0.05$. Therefore, it can be concluded that there is a significant relationship between early marriage and the incidence of stunting among children under five.

Relationship Between Dietary Patterns and Stunting Cases

Based on Table 4, the percentage results of this study show the distribution of stunting cases among the 76 respondents. Of these, 58 respondents (76.3%) had inadequate dietary patterns, while 18 respondents (23.7%) had adequate dietary patterns. Among the 58 respondents with inadequate dietary patterns, 36 respondents (62.0%) had children who experienced stunting, while 22 respondents (37.9%) had children who did not experience stunting. For respondents with adequate family dietary patterns, 6 respondents (33.3%) had children who experienced stunting, while 12 respondents (66.6%) had children who did not experience stunting.

The results of the statistical analysis using the Chi-Square test showed a p-value of 0.11, meaning $P > 0.05$. Therefore, it can be concluded that there is no significant relationship between family dietary patterns and the incidence of stunting among children under five.

Relationship Between Parenting Patterns and Stunting Cases

Based on Table 5, the percentage results of this study show the distribution of stunting cases among the 76 respondents. Of these, 34 respondents (44.7%) practiced poor parenting patterns, while 42 respondents (55.3%) practiced good parenting patterns. Among the 34 respondents with poor parenting, 23 respondents (30.3%) had children who experienced stunting, while 11 respondents (14.5%) had children with good nutritional status. Among respondents with good parenting patterns, 12 respondents (15.8%) had children who experienced stunting, while 30 respondents

(39.5%) had children who did not experience stunting.

The results of the statistical analysis using the Chi-Square test showed a p-value of 0.002, meaning $P < 0.05$. Therefore, it can be concluded that there is a significant relationship between parenting patterns and the incidence of stunting among children under five.

CONCLUSION

The results found in this study show that, out of the six variables examined, there were two variables that were not associated with the incidence of stunting: maternal education level and family dietary patterns.

AUTHOR CONTRIBUTIONS

Conceptualization, M.S.S, D.A., L.S.; Methodology, M.S.S.; Validation, D.A., L.S.; Formal Analysis, M.S.S.; Investigation, M.S.S., Resources, M.S.S.; Data Curation, M.S.S.; Writing-Original Draft Preparation, M.S.S., D.A., and L.S.; Visualization, M.S.S. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declares that there is no conflict of interest.

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