

## Factors Associated with the Incidence of Stunting in 18 - 24 Months Old Children in Malaka Village, Sumedang District, West Java, Indonesia

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### Abstract

Stunting has been one of major concerns for the Indonesian government. In 2013, Indonesia reached the number of 37.2% for national stunting incidence, constantly increasing from year 2010 (35.6%) and 2007 (36.8%) according to Indonesian Basic Health Research (Riset Kesehatan Dasar). The National Nutrition Status Monitoring (Pemantauan Status Gizi) in 2017 recorded that 17.8% children of Indonesia were malnourished and 12.1% of them were stunted. Whereas data from the Ministry of Health of the Republic of Indonesia in 2017 showed that the prevalence of under-fives nationally with stunting was 29.6%. At provincial level, West Java ranked 26<sup>th</sup> with 35.3% as the number of stunting incidence. Sumedang District is one of 100 districts assigned as the main focus for stunting intervention program. In addition, Malaka Village in Sumedang District is one of 1,000 villages in Indonesia designed to be intervened as it held a high incident of children suffering from stunting. This study was aimed to find the association between birth length, birth weight, family economic status, exclusive breastfeeding, mother's knowledge with the incidence of stunting in children aged 24-48 months old. The total sample of the study was 62 children, determined through accidental (convenience) sampling. Malaka Village had a prevalence of stunted children at a percentage of 27.4%. From univariate analysis with Spearman's Rho correlation test, birth length and exclusive breastfeeding showed significant associations with stunting while other factors failed to demonstrate such associations.

**Keywords:** malnutrition, birth length, birth weight, exclusive breastfeeding

## Faktor yang Berhubungan dengan Stunting pada Anak Usia 18-24 Bulan di Desa Malaka, Sumedang, Jawa Barat, Indonesia

### Abstrak

Stunting merupakan salah satu permasalahan utama bagi pemerintahan Indonesia. Pada tahun 2013, insiden stunting secara nasional di Indonesia mencapai 37.2%. Angka ini meningkat terus-menerus sejak tahun 2010 (35.6%) dan 2007 (36.8%) berdasarkan data dari Riskesdas. Pemantauan Status Gizi tahun 2017 mencatat bahwa 17.8% anak-anak Indonesia mengalami malnutrisi dan 12.1% di antaranya juga mengalami stunting. Data dari Menteri Kesehatan Republik Indonesia pada tahun 2017 menunjukkan bahwa prevalensi balita stunting sebesar 29.6%. Pada tingkat provinsi, Jawa Barat berada pada peringkat 26 dengan insiden stunting sebesar 35.3%. Kabupaten Sumedang merupakan salah satu dari 100 kabupaten yang ditetapkan sebagai focus intervensi stunting. Desa Malaka pada Kabupaten Sumedang juga merupakan salah satu dari 1,000 desa di Indonesia yang akan dilakukan intervensi stunting karena angka kejadian stunting yang cukup tinggi. Penelitian ini bertujuan untuk mencari hubungan antara panjang badan lahir, berat badan lahir, status ekonomi keluarga, ASI eksklusif, pengetahuan gizi ibu terhadap kejadian stunting pada anak usia 24-48 bulan. Total sampel dari penelitian ini sejumlah 62, yang ditentukan dengan *accidental (convenience) sampling*. Prevalensi anak stunting di Desa Malaka ditemukan sebesar 27.4%. Dengan analisis univariat menggunakan uji korelasi Spearman Rho, didapatkan bahwa panjang badan lahir dan ASI eksklusif memiliki hubungan yang signifikan terhadap kejadian stunting, sedangkan faktor lainnya tidak menunjukkan hubungan yang signifikan.

**Kata kunci:** malnutrisi, panjang badan lahir, berat badan lahir, ASI eksklusif

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## Introduction

Nutritional status is a condition caused by a balance between the number of nutrient intakes and the amount needed by the body for various biological functions including physical growth, development, activity, and health care. An unbalanced nutritional consumption to one's body will cause malnutrition, whether it is excessive or deficient nutritional intakes. Nutritional status of children under five is a reliable indicator of community nutrition and has been developed as an indicator of community health and well-being because, at such age, children are vulnerable to a variety of diseases. The process of rapid growth and development of children under five requires a balanced nutritional intake, thus an unmet need of nutritional intakes will disrupt the process.<sup>1</sup> This explains as one of the most reliable indicators to see the nutritional status of under-fives is growth.

In 2012, 165 million children under 5 years were in stunting condition and 90% were in Africa and Asia.<sup>2</sup> Based on data from UNICEF, an estimated three million children die each year due to malnutrition. In 2016 out of 667 million under-fives throughout the world 159 million under-fives suffered stunting and 50 million under-fives suffered wasting.<sup>3</sup> In the 2013 Indonesian Basic Health Research (Riskesdas) data, the prevalence of national stunting was 37.2%, where there was an increase compared to 2010 (35.6%) and 2007 (36.8%).<sup>4</sup> According to data from the Ministry of Health of the Republic of Indonesia in 2017, the prevalence of under-fives nationally with malnutrition was 17.8%, stunting was 29.6%, and wasting was 9.5%. When compared with the prevalence rate from 2016, stunted under-fives experienced an increase from the previous figure of 27.5%, while the rate of wasted under-fives underwent a decline from the previous figure of 11.1%.<sup>5</sup> Based on the results of the national

Nutrition Status Monitoring in 2017, 17.8% of children suffering from malnutrition were found and 12.1% of them were stunted.<sup>6</sup>

Based on national stunting prevalence, from 34 provinces in Indonesia, West Java ranked 26th (35.3%).<sup>4</sup> The stunting prevalence in Sumedang district in 2013 was 41.08% with the number of stunting under-fives at 37,970.<sup>7</sup> Sumedang district was included in the 100 districts that have the highest stunting rate in Indonesia, which has been the focus of the government. Ten villages in the district, including Malaka Village, were additionally included in 1,000 villages, which represent the focus of the stunting intervention program in Indonesia.

Stunting is a condition of failure to thrive in children under five due to chronic malnutrition so children are too short for their age. Malnutrition occurs since in-utero until in the first 2 years after the baby is born, known as the first 1000 days of life (270 days in the womb and 730 days after birth). However, stunting conditions generally can only be seen after the age of two years. Stunting affects the level of intelligence, vulnerability to disease, decreases productivity and then inhibits nation's economic growth which can ultimately increase poverty and inequality. Stunting is caused by many factors related to one another.

As follows, the primary aim of this study was to find factors associated with the incidence of stunting. Factors that influence the occurrence of stunting in 18 - 24 months old children, specifically the mother's knowledge regarding nutrition for children, family economic status, exclusive breastfeeding, birth length, and birth weight were observed in this study.

## Materials and Methods

This study used a cross-sectional design to determine factors associated with stunting in children aged 24-48 months. The study

was conducted in November 2018 in Malaka Village, Sumedang District, West Java. To meet the number of samples needed, non-probability sampling method (convenience sampling) was used in the form of accidental sampling. The tools used in this study were questionnaires and anthropometry kit. Inclusion criteria for respondents were those who were willing to participate in the study, had children aged 24-48 months old, and domiciling in Malaka Village, Sumedang Districts, West Java. Whereas the exclusion criteria include those who were not willing to participate in the study, were not aged 24-48 months old, and were not domiciled

in Malaka Village, Sumedang. Prior to the initiation of the study, the prospective respondents were asked informed consent.

The type of data used were primary data in the form of interviews and anthropometric measurements. Data were compiled and presented in the form of narration, text, tables, and graphs. Collected data were then analysed through univariate analysis method using IBM SPSS® to determine the association between the dependent and independent variables. The independent variables were characteristics of children (birth length and birth weight), family economic status, exclusive breastfeeding and mother's knowledge of nutrition. Whereas

**Table 1. Operational Definition of Key Variables Used in the Study**

Variable	Definition	Measurement Tool	Scale	Measurement Results
<b>Age</b>	The life span of a child, calculated since birth date until the time of research.	Questionnaire	Ratio	1 = Under-fives (< 5 years old) 2 = Children (5 – 11 years old)
<b>Stunting</b>	A combination between short-statured and very short-statured under-fives in accordance with the height-for-age graph from WHO	Anthropometry	Nominal	1 = Z-score <-2 SD until ≤ -3 SD (short stature) 2 = Z-score >-3 SD (very short stature)
<b>Economic status</b>	The economic status of a person or family based on monthly income based on regional minimum wages in Sumedang District.	Questionnaire	Ratio	1 = > Rp.2.600.000 2 = Rp.1.000.000 until Rp. 2.600.000 3 = < Rp.1.000.000
<b>Birth length</b>	Birth length in infants is measured in conjunction with the baby's birth weight. < 48 cm = short 48 - 52 cm = normal > 52 cm = tall	Questionnaire	Nominal	1 = Short 2 = Normal 3 = Tall
<b>Birth weight</b>	Body weight in infants measured or weighed within the first 1 hour after birth.	Questionnaire	Ratio	1 = < 2500 gr 2 = > 2500-4000 gr 3 = > 4000 gr
<b>Exclusive breastfeeding</b>	Breast milk given to babies since birth until the age of six months, without adding or replacing with other foods or drinks.	Questionnaire	Nominal	1 = exclusive breastfeeding is not given 2 = exclusive breastfeeding is given
<b>Mother's knowledge regarding nutrition</b>		Questionnaire	Ratio	1 = Insufficient 2 = Sufficient 3 = Good

the dependent variable was the incidence of stunting in children aged 24-48 months old. Stunting was defined as a short or very short stature based on body length or body height with height-for-age z scores less than  $-2$  (see Table 1).

## Results

This research was conducted in 62 children aged 24-48 months in Malaka Village.

**Table 2. Distribution of Characteristics of the Mothers and Children By the Presence of Stunting**

Characteristics	Normal		Stunting	
	f	%	f	%
<b>Children</b>				
Sex				
Male	19	42.22	7	41.18
Female	26	57.78	10	58.82
Birth length				
Short stature (<48 cm)	8	17.78	9	52.94
Normal (48-52 cm)	36	80.00	8	47.06
Tall stature (>52 cm)	1	2.22	0	0
Birth weight				
Low (<2500 g)	2	4.45	2	11.76
Normal (2500-4000 g)	42	93.33	14	82.36
High (>4000 g)	1	2.22	1	5.88
Exclusive breastfeeding				
Given	26	57.78	4	23.53
Not given	19	42.22	13	76.47
<b>Mothers</b>				
Highest education level				
Elementary school	8	17.78	2	11.76
Middle school	17	37.78	11	64.71
High school	13	28.89	4	23.53
Diploma/bachelor	7	15.55	0	0
Family economic status				
Insufficient	9	20.00	2	11.76
Sufficient	18	40.00	5	29.42
Good	18	40.00	10	58.82
Knowledge regarding nutrition				
Insufficient	0	0	1	5.88
Sufficient	2	4.45	1	5.88
Good	43	95.55	15	88.24

Based on the children's characteristics, it is known that in this study there were more stunting girls than boys (58.82 vs. 41.18). More than half (52.94%) stunting children vs. 17.78% non-stunting children had short birth length (Table 2). However, the majority (>75%) children in both groups had normal weight at birth. The number of stunting vs. non-stunting children who were not given exclusive breastfeeding 76.47 vs 42.22%, respectively.

As for the mothers' characteristics, in stunting children, most (64.71%) mothers' highest education was the middle school level, while more than half of the mothers of children without stunting were high school or university graduates (Table 2). Surprisingly, 58% stunting children came from family with good economic status and 88% of their mothers had good knowledge about nutrition.

**Table3. Variable Correlation Test Using Spearman's Rho Test**

Variable	Correlation coefficient	Significancy
Birth length	.355**	.005
Birth weight	.055	.670
Family economic status	-.167	.193
Eclusive breastfeeding	-.306*	.016
Mother's knowledge regarding nutrition	.138	.286

\*. Correlation is significant at the 0,05 level (2-tailed).

\*\*. Correlation is significant at the 0,01 level (2-tailed).

As shown in Table 3, short birth length had positive association ( $r = 0.355$   $p = 0.005$ ) while having exclusive breastfeeding had a negative association ( $r = -0.306$   $p = 0.016$ ) with the incidence of stunting in children aged 24 - 48 months old in Malaka Village, Sumedang District, West Java, Indonesia. Other factors, namely birth weight, family economic status, and mother's knowledge regarding nutrition did not show significant associations with the incidence of stunting.

## Discussion

Based on the characteristics of birth length, more stunting respondents had shorter birth lengths (<48 cm) than those who did not suffer from stunting condition. This is in line with the theory of the Ministry of Health of the Republic of Indonesia published in the Infodatin Situasi Balita Pendek Year 2016, which said that short birth length is one of the risk factors for stunting in children. Short birth length can be caused by various factors, including parents' genetic and lack of nutrition during pregnancy.<sup>8</sup>

While based on birth weight characteristic, stunting was more common in respondents who had normal birth weight (2500-4000 g). This is not in line with the theory of the Indonesian Ministry of Health, which said that the high number of low birth weights (LBW) is estimated to be

the cause of the high incidence of stunting in Indonesia. LBW is the most dominant factor causing stunting.<sup>8</sup> Small sample size and non-random sampling methods might explain the discrepancy, that the samples may not be good representation of the Indonesian stunting children.

Based on family economic status, children with good family economic status experience more stunting than those without. Moreover, stunting children in this study was more prevalent from mothers who had good knowledge of nutrition. This is not in accordance with the theory of the Indonesian Ministry of Health, Info dan Situasi Balita Pendek Year 2016, which stated that low family economic status is one of the causes of stunting, which is influenced by several factors, including parents' work, education level of parents, and number of family members. The economic status of the family will affect the ability to fulfill family nutrition and the ability to obtain health services. Children in low economic families are more at risk of stunting because of the inability to fulfill adequate nutrition, increasing the risk of malnutrition.<sup>8</sup> It is important to note that the author assessed the family economic status of family income based on Sumedang District's minimum regional wage for fulfilling daily needs in which each regions are different.

Birth length and exclusive breastfeeding are other factors that can cause stunting. Short birth length in children shows inadequate nutrients consumed by mothers during pregnancy. Exclusive breastfeeding equally carries out an important role in fulfilling infants' nutritional needs. Insufficient nutrition consumption will lead to growth restriction especially during the first 1000 days of life, increasing the risk of stunting.<sup>8</sup> Table 3 shows positive relationship between short birth length and the incidence of stunting: the shorter the birth length, the higher the incidence of stunting. In contrast,

exclusive breastfeeding had a negative association with the incidence of stunting: the more children were given exclusive breastfeeding, the stunting incidence decreased. This is in line with the research conducted by Kusuma<sup>9</sup> which showed short birth length and non-exclusive breastfeeding were risk factors for stunting in infants.

A larger study with random sampling technique is required to obtain more accurate and representative data in Sumedang District. Further research development regarding stunting related factors should be done, including environmental factors, family genetics, maternal reproductive health and gestational history.

## Conclusion

The incidence of stunting in children aged 24-48 months old in Malaka Village, Sumedang District, West Java in 2018 was 27.5%. Birth length and exclusive breastfeeding were significantly associated with stunting condition while birth weight, family economic status, and mother's knowledge regarding nutrition did not show significant association.

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