

## International Journal of Research Publications

# Risk Factors of Stunting in Children Under Five in Mentaya Hilir Utara Subdistrict, Kotawaringin Timur District, Kalimantan Tengah Province, Indonesia 2017

Saulina Aritonang<sup>a\*</sup>, Roselina Panghiyangani<sup>b</sup>, Husaini<sup>c</sup>, Triawanti<sup>d</sup>, Lenie Marlinae<sup>e</sup>

<sup>a</sup>*Kotawaringin Timur District Health Office, Kalimantan Tengah, Indonesia*

<sup>b</sup>*Biomedical Department of the Faculty of Medicine Lambung Mangkurat University*

<sup>c</sup>*Master of Public Health Science Program, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin*

<sup>d</sup>*Department of Biochemistry, Faculty of Medicine Lambung Mangkurat University*

<sup>e</sup>*Public Health Study Program, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin*

---

### Abstract

Stunting is a problem in many countries, including Indonesia. The incidence of stunting in toddlers in Kotawaringin Timur Regency in 2016 was 40.7%, and in 2017 it rose again to 41.8%. Stunting is caused by many factors both directly and indirectly, including those that are problems in the research location are birth weight (LBW), nutritional status of pregnant women (mid-upper arm circumference), poverty factors, and health service coverage. This study uses a quantitative approach with observational analytic using a cross-sectional study design. The population in this study were mothers who had children under five in North Mentaya Hilir Subdistrict with a total sample of 101 people. The results showed that there was a relationship between birth weight and the incidence of stunting in infants with a p-value of 0.027 ( $p < 0.05$ ). There was a relationship between mid-upper arm circumference (LILA) of pregnant women and the incidence of stunting in infants with a p-value of 0.017 ( $p < 0.05$ ). There is a relationship between family income and the incidence of stunting in infants with a p-value of 0.038 ( $p < 0.05$ ). There was a relationship between visits to health services and the incidence of stunting in infants with a p-value of 0.044 ( $p < 0.05$ ). Factors that are strongly or dominantly related to the

---

\* Corresponding author. Saulina, *Master of Public Health Science Program, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, Jl. A. Yani, Km.36,3, Banjarbaru, 70714, Kalimantan Selatan, Indonesia*

incidence of stunting in toddlers are family income variables OR 0.43, Exp B 2.699, the most significant means that respondents with less family income than regional minimum wage will be at risk of experiencing stunting in infants 2,699 times greater than income family more than regional minimum wage.

© 2019 Published by IJRP.ORG. Selection and/or peer-review under responsibility of International Journal of Research Publications (IJRP.ORG)

*Keywords:* stunting, birth weight, upper arm circumference, health services, income

---

## 1. Introduction

Stunting is a problem of chronic malnutrition caused by insufficient nutrition in a long time due to the provision of food that is not following nutritional needs (Maulidah, 2019). The World Health Organization (WHO) sets a tolerance limit for stunting (short stature) of a maximum of 20% or one-fifth of the total number of children under five. (WHO, 2013).

WHO sets stunting in Indonesia at 35.6% (17.1% in the short category and 18.5% in the very short category) this figure is far higher than several Southeast Asian countries, namely Vietnam 23%, Philippines 20%, Malaysia 17%, and Thailand 16%. Based on the results of Nutritional Status Monitoring (PSG) carried out every year throughout Indonesia, National Stunting data obtained in 2015 amounted to 29%, 2016 amounted to 27.5% and in 2017 amounted to 29.6. For the Province of Kalimantan Tengah, the data in 2015 was 33.3%, 2016 was 34.1% and in 2017 was 39%. Whereas for the level of East Kotawaringin Regency, stunting was obtained in 2016 by 26%, then increased in 2016 by 40.7% and in 2017 it increased again to become 41.8% (Dinkes Prop. Kalteng, 2017). Based on data on the results of the risk-smart stunting rate in 2013 amounting to 36.9% but in 2018, there was an increase in the stunting rate to 48.84 % (Ministry of Health, 2017).

Stunting is caused by many factors, both directly and indirectly. Direct factors are determined by food intake, birth weight (BBL), and disease. While indirect factors such as economic, cultural, educational, and employment factors, health care facilities. Socio-economic factors interact with one another with inputs such as nutrition, birth weight, and infectious diseases in children (Sukmawati, 2018). According to UNICEF the factors associated with stunting are health services, weight at birth (temporal causes), nutritional conditions of pregnant women, exclusive breastfeeding, poverty (indirect causes) and the incidence of diarrhea in infants (direct causes). Stunting has a lifetime impact on children. Indonesia targets a reduction of stunting rate by 40% by 2025 (Ministry of Health, 2016).

Based on the results of Setiawan's research, (2018) factors related to stunting events include infectious diseases, low body length at birth, supplementary feeding that is not appropriate according to age and parenting. LBW is the most associated factor with stunting with a value of  $p = 0.002$ . LBW risk is 3.05 times greater for stunting toddlers compared to BBLN. Also, according to Vaozia, (2016), maternal nutritional status (LILA) before and during pregnancy also plays a role as a trigger for stunting. Nutrition of pregnant women (LILA <23.5) is 1.68 times the risk of stunting toddlers compared to nutrition pregnant women (LILA > 23.5).

Another thing that also affects the stunting event is the nutritional status of pregnant women and women of childbearing age in general. The nutritional status of women of reproductive age (WUS) 15-49 years who are pregnant or not pregnant is categorized as a risk of chronic energy deficiency (CED) if the size of the mid-upper arm circumference (LILA) is <23.5 cm. Kalimantan Tengah has 2350 cases of pregnant women with CEDs (21%). Mothers giving birth with CED gave birth to babies with low birth weight (LBW) of 416 people (64%) out of a total LBW of 645 people. The number of LBW cases in Kalimantan Tengah is 556 (1.2%)

cases (2015), as many as 645 (1.5%) cases of the total number of live births weighed (2016) in 2017 as much as 1.3% (Health Office of Kalimantan Tengah, 2018).

Another risk factor that causes high rates of stunting is poverty. Indonesia still has areas that still have poor populations, namely South Sulawesi, West Kalimantan, Kalimantan Tengah, North Kalimantan, and South Kalimantan (PSG 2016). The majority of family heads are 8.5% who work as farmers/fishermen/ laborers with an average stunting mother, 96% of housewives or mothers who do not work (BPS, 2017).

Health services have health service coverage for Kalimantan Tengah Province of 59.3% (2014) and 68.3% (2015) and 63.3% (2016). This figure is still far from the target, which must be at least 80% while health service coverage in East Kotawaringin Regency is 79% (2014), 68.9% (2015) and 55.9% (2016). (Profile of the Kalimantan Tengah Provincial Health Office, 2017). Based on data from the profiles of the 2018 Kotawaringin District Health Office, health care coverage rates were 59% (2015), 52.6% (2016) and 59.4% (2017). Based on the two data above, the coverage of toddler services both at the provincial and district levels is still below the target standards that must be achieved.

According to the results of preliminary data from the Palangka Raya Polytechnic Field Work Practice, the stunting data in North Mentaya Hilir Subdistrict was 42.7%. The total number of pregnant women was 414 people; total under-fives were 1,434 people, under-fives with LBW were 4 pregnant women with CED with LILA <23.5 cm as many as 19 people, coverage of under-fives services was 68.4%. (Data from Mentaya Hilir North District Health Center, 2017). This is thought to be a risk factor associated with the incidence of stunting in children under five. To prove this, this research needs to be done.

## 2. Methods

This study uses a quantitative approach with observational analytic using a cross-sectional study design. The population in this study were mothers who had children under five in North Mentaya Hilir Subdistrict namely Bagendang Hulu Village, Bagendang Permai Village, Bagendang Hilir Village, Bagendang Tengah Village, Sumber Makmur Village, Natai Baru Village, and Pondok Damar Village, in East Kotawaringin Regency Kalimantan Tengah Province. This is based on stunting cases that were reported to the Kotawaringin District Health Office in 2015-2017. The research was conducted in April 2018 until February 2019.

The size of the sample in this study using the sample calculation formula according to Lemeshow (1997) and numbered 101 people. The sampling process uses Purposive random sampling with the criteria of registered toddlers in the local health center, the toddler is willing to be used as a research sample and is willing to be a respondent, toddlers are not in sick conditions, such as ARI, diarrhea or other diseases that have been checked by the doctor Local health center, 1 toddler represents 1 family.

## 3. Results

Table 1. Frequency Distribution of Birth Weight, Mid-Upper Arm Circumference (LILA), Family Income, Health Services, and Stunting Events in Toddlers in North Mentaya Hilir District, East Kotawaringin Regency in 2019

Variable	Frequency	Percentage
<b>Birth Weight</b>		
<2.5 kg	71	70.3
> 2.5 kg	30	29.7

Variable	Frequency	Percentage
<b>Mid-Upper Arm Circumference (LILA)</b>		
< 23.5 cm	66	65.3
> 23.5 cm	35	34.7
<b>Family Income</b>		
Low	66	65.3
High	35	34.7
<b>Health services</b>		
Not good	68	67.3
Well	33	32.7
<b>Stunting in toddlers</b>		
Stunting	69	68.3
Normal	32	31.7

Table 2. Bivariate Analysis of the Relationship between Birth Bodies, Mid-Upper Arm Circumference (LILA), Family Income, Health Services, and Stunting Events in Toddlers

Variable	Toddler Nutrition Status				Total	p-Value	OR
	Stunting		Normal				
<b>Birth Weight</b>							
LBW	26	36.6	45	63.4	71	0.027	1,433
Normal	6	20.0	24	80.0	30		
<b>Mid-Upper Arm Circumference (LILA)</b>							
<23.5 cm	48	72.7	18	27.3	66	0.017	1,778
> 23.5 cm	21	60.0	14	40.0	35		
<b>Family Income</b>							
Low	47	71.2	19	28.8	66	0.038	1,462
High	22	62.9	13	37.1	35		
<b>Health services</b>							
Not good	45	66.2	23	33.8	68	0.044	2,734
Well	24	72.7	9	27.3	33		

Table 3. Multivariate Analysis of Relationships between Birth Weight, Mid-Upper Arm Circumference (LILA), Family Income, Health Services, and Stunting Events in Toddlers

Variable	Sig.	Exp. B
Birth Weight	0 .13	2,220
Family Income	0 .043	2,699
Health Service	0 .058	1303

## 4. Discussion

### a. Relationship between Birth Weight and the incidence of Stunting in Toddlers

According to the Aridiniyah study (2015), low birth weight has a higher chance of experiencing stunting. The impact of low birth babies will last from generation to generation. Related to stunting in Rahmadi's study, (2016) a history of low birth weight < the incidence of stunting usually accompanies 2500 gr; therefore, this condition needs to be addressed early. Low birth weight problems are health problems that occur in poor and developing countries that are closely related to mortality and morbidity and subsequent growth and development. In the neonatal period, LBW nutrition is the biggest compared to the needs in the optimal development period.

This is in line with Setiawan's research, (2018) Low Birth Weight (LBW) factor is the most dominant risk factor for the incidence of stunting in under-five children. Characteristics of a baby at birth (LBW or normal BBL) are things that determine a child's growth. Children with a history of LBW experience linear growth slower than children with a history of normal BBL. The pregnancy period for the first two years of the child's age is critical. Impaired growth in this period is difficult to repair and children have difficulty achieving optimal growth and development.

### b. Relationship of Upper Arm Circumference with Stunting in Toddlers

According to research Rosmalina M, (2018) women with upper arm circumference <23.5 cm or experiencing CED during pregnancy will result in stunting. This is because mothers who have CED during pregnancy have unbalanced food intake so that they will give birth to LBW babies. This situation causes the baby to be susceptible to disease so that its growth and development is hampered and will cause stunting. There is a significant relationship between arm circumference on CED of pregnant women with the incidence of stunting. According to Kusumawati, (2015), there is a meaningful relationship between CEDs increasing the risk factors for stunting in infants.

In line with the Sukmawati study, (2018) there was a relationship between maternal nutritional status during pregnancy (LILA) and the incidence of stunting in infants aged 06-36 months with a value of  $p = 0.01$  ( $<0.05$ ), and there was a relationship between infant birth weight and stunting at toddlers aged 6-36 months with a value of  $p = 0.02$  ( $<0.05$ ), that pregnant women who experience Chronic Energy Deficiency (CED) have an 8.24 times greater risk of giving birth to babies with LBW who will have an impact on stunting in children in the future.

### c. Relationship between family income and the incidence of stunting in infants

According to Rahmadi, (2016) family income is closely related to economic limitations, purchasing power, the fulfillment of macro and micro nutrition of pregnant women and toddlers, the quality and quantity of food consumed by families, access to health services, variations in food. The reduced nutritional intake of pregnant women and nursing mothers will be related to the quality of breast milk production for the growth and development needs of the baby. In accordance with Maulid ah research, (2019) that families with high family income will tend to consume lighter foods that contain high energy than low-income families, only choosing to consume low-calorie snacks. Consumption of unbalanced and insufficient foods is more susceptible to infection in infants and toddlers. Low family income causes a lack of care and cares for children under five, low environmental cleanliness, low access to health services will cause stunting.

### d. Relationship between health care visits and the incidence of stunting in infants

The results of Vaozia's study (2016) stated that visits to health services, including *posyandu* were an indicator of affordability of basic health services. Includes growth and development monitoring. The level of

attendance of visits to health services has a major influence on monitoring nutritional status. The frequency of visits to the *posyandu* is said to be successful if it meets the target of visits > 8x in 1 year. The results of this study have a relationship between visits to *posyandu* or health services with the incidence of stunting in infants.

In line with Rosmalina's research, (2018) showed that the most dominant factor in the incidence of stunting was the frequency of visits to the *posyandu*. Toddlers with low visits to health services have a 3.1-time risk of stunting compared to toddlers who regularly visit Posyandu or to health services. According to Milward, (2017) the level of active visits will be closely related to nutritional monitoring, and mothers of children under five get the latest information about health that is useful in determining healthy lifestyles and good parenting for toddlers.

Based on table 3, it shows that the most dominant variable is the family income variable OR 0.43, Exp B 2.699, the most significant means that respondents with less family income than the regional minimum wage will be at risk of experiencing stunting in infants 2,699 times greater than family income more than the regional minimum wage. This relates to various factors such as low family income resulting in decreased purchasing power so that the availability of foodstuffs in the household will be less, which results in less nutritional intake. Unmet needs will result in CED pregnant women and will give birth to babies with a low birth weight if this is not immediately addressed will result in the occurrence of stunting. The parent factor works; the number of members in the household will also be related to the family income. With the work of parents, family income will also increase, and with a small number of families (4 people in a household consisting of father, mother and two children), their nutritional needs will be more fulfilled.

In line with Setiawan's research, (2018) related to stunting in children under five, low family income caused a lack of care and parenting for toddlers, low environmental hygiene, low access to health services which would cause stunting. Stunting is a health problem that occurs in poor and developing countries that is closely related to family income; this will cause low nutritional status for pregnant women, infants, and toddlers. The neonatal period, nutrition is the greatest compared to the needs in the optimal development period. If this is not achieved, it will increase mortality and morbidity and the disruption of subsequent growth and development (Anasiru, 2018).

## 5. Conclusion

There is a relationship between birth weight and the incidence of stunting in infants with a p-value of 0.027 ( $p < 0.05$ ). There was a relationship between mid-upper arm circumference (LILA) of pregnant women and the incidence of stunting in infants with a p-value of 0.017 ( $p < 0.05$ ). There is a relationship between family income and the incidence of stunting in infants with a p-value of 0.038 ( $p < 0.05$ ). There was a relationship between visits to health services and the incidence of stunting in infants with a p-value of 0.044 ( $p < 0.05$ ). Factors that are strongly or dominantly related to the incidence of stunting in toddlers are family income variables OR 0.43, Exp B 2.699, the most significant means that respondents with less family income than regional minimum wage will be at risk of experiencing stunting in infants 2,699 times greater than income family more than regional minimum wage.

## References

- Anasiru MA. (2018) Effect of Energy and Protein Consumption, Parenting Patterns, and Health Status on Stunting Events in Children 12-36 Months at Tilango Health Center, Tilango District, Gorontalo Regency. *Health and Nutrition Journal* . 4 (1); 7-16.
- Aridiyah FO. (2015) Factors that influence the incidence of stunting in children under five in rural and urban areas. *Health Library e-Journal* .3 (1); 163-70.
- Central Bureau of Statistics. (2017) *Population Profile of Kalimantan Tengah in 2016*. BPS. Palangkaraya.

- Kalimantan Tengah Provincial Health Office (2017) *Kalimantan Tengah Profile in Figures* . Dinkes, Palangkaraya.
- Kalimantan Tengah Provincial Health Office (2018) *Profile of Kalimantan Tengah in Figures* . Dinkes, Palangkaraya.
- Kotawaringin Timur Health Office (2016) *Nutritional Status Monitoring Data (PSG) of East Kotawaringin Regency*, Kotawaringin Health Office. Palangkaraya.
- Republic of Indonesia Ministry of Health. (2016) *Short Toddler Situation*. Indonesian Ministry of Health Data and Information Center. Jakarta.
- Republic of Indonesia Ministry of Health. (2017) *Nutritional Status Assesment Pocket Book*. Directorate General of Community Health Development Directorate of Community Nutrition Development. Jakarta.
- Kusumawati (2015) Model of controlling stunting risk factors in children under three years of age, *National Public Health Journal* 9 (3)
- Lameshow S, & David WH (1997) *Large Samples in Health Research* (translation). Publisher of Gadjah Mada University Press. Yogyakarta.
- Maulidah. (2019) Factors related to the incidence of stunting in children under five in Panduman Village, Jelbuk District, Jember Regency. *Indonesian Nutrition Science Journal*, 2 (2); 89-100.
- Millward DJ. (2017) Nutrition, Infection, and Stunting: the roles of deficiencies of individual nutrients and foods, and determinants of reduced linear growth of children. *Nutrition Research Reviews* . 30 (1); 50-72.
- Mentaya Hilir North Health Center. (2017) *Data on Puskesmas Kecamatan Mentaya Hilir Utara in 2016* .
- Rahmadi A. (2016) Relationship between Birth Weight and Body Length with the incidence of Stunting of Children 12-59 Months in Lampung Province. *Nursing Journal*. 12 (2); 209-218.
- Rosmalina. (2018) Toddler stunting prevention and prevention efforts: a systematic review. *Indonesian Nutrition Journal* ; 41 (1); 1-14.
- Setiawan. (2018) Factors Associated with Stunting Events in Children aged 24-59 Months in the Andalas Community Health Center Working Area in Padang Timur District, Padang City in 2018. *Andalas Health Journal*. 7 (2); 275-284 .
- Sukmawati. (2018) Nutritional Status of Mothers During Pregnancy, Birth Weight of Babies With Stunting in Toddlers. *Journal of Food Nutrition Media* . 25 (1); 18-24.
- Vaozia S, Nuryanto. (2016) Risk factors for stunting in children aged 1-3 years (study in Menduran Village, Brati District, Grobogan Regency). *Journal of Nutrition College*. 5 (4); 314-20.
- WHO. (2013). *Childhood Stunting: Context, Causes, and Consequences* in <http://www.who.int/nutrition/> accessed 12 November 2016.