

**Factors Affecting The Stunting Case: A Retrospective Study On Children In Banjarmasin**Anggrita Sari<sup>1\*</sup>,<sup>1</sup>Akademi Kebidanan Sari Mulia Banjarmasin

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**ABSTRAK****Objective:** This is to analyze the factors that influence the stunting case in toddlers in Banjarmasin**Method:** This research used case control with 190 toddlers as the sample consisting of 74 stunting children under five and 116 toddlers with stunting and was analyzed using Chi-Square test.**Result:** The result of the research showed that there was a correlation between birth weight and stunting case in infants  $p\text{-value} = 0,032$  and OR 3,082, there was a correlation between gestational age and stunting incidence in pita  $p\text{-value} = 0,006$  and OR 3,712. in children under five  $p\text{-value} = 0.001$  and OR 5,551, whereas exclusive breastfeeding was not related to stunting incidence in under-five children with  $p\text{-value} = 0,377$  and there was no association of basic immunization status with stunting incidence in under-fives with  $p\text{-value} = 0,120$ .**Conclusions:** Low birth weight infants, preterm gestational age, and less than normal birth weight were factors that influenced stunting cases, while the history of exclusive breastfeeding and primary immunization has no relationship with the incidence of stunting.**Keywords:** Age of gestation, Birth Weight Infant, Exclusive Breast Milk, Immunization, Length of Birth, Retrospective Study, of Stunting Toddler.

## I. INTRODUCTION

Stunting is a chronic condition that describes stunted growth due to chronic malnutrition based on age index (PB / U) or height by age (TB / U), z-score for short category is  $-3$  SD to  $<-2$  SD and very short is  $<-3$  SD [1]. Nutrition status is the expression of a state of equilibrium in a particular form or the embodiment of nutrients in the form of a particular variable can be inferred, nutritional status is a healthy state of a certain form of balance associated with the use of food by the body [8-9].

Nutrition problems become a problem in Indonesia, such as anemia, wasting, low birth weight and stunting Of the 15 provinces in Indonesia, which is classified as serious for stunting problems among children, one of them is South Kalimantan which is ranked fifth for short toddlers with prevalence 44, 2% [4]. Based on data from the Banjarmasin City Health Office in 2017 the number of Stunting incidents increased: the year 2014 stunting prevalence of 13.96% and in 2015 to 21.55%. The highest prevalence of under-five stunting in 2016 was Alalak Selatan Puskesmas 55,4%, Puskesmas Kelayan Dalam 39,54% and Puskesmas 9 November 32,87%. So the city of Banjarmasin, South Kalimantan Province, needs serious attention and handling to reduce the number of stunting incidents in infants. [5-7].

Several factors contribute to stunting; key among them are nutritional deprivation or adverse fetal environment during pregnancy,

poor quality diets during the complementary feeding period and frequent infections. Stunting has origins during the fetal stages [2-3]. According to research from Rahmi, the prevalence of stunting decreased of significantly from waves 1 to 4 (from 50.8% to 36.7% as did the prevalence of at-risk obesity increased from 10.3% to 16.5%. [10]. Preliminary studies conducted by researchers at the Banjarmasin City Health Office The case of Stunting in Banjarmasin city. Based on this study, the researcher is interested to do research on Factors Affecting Stunting Event: Retrospective Study on Toddlers in Banjarmasin City.

## II. RESEARCH METHODS

The population is a child aged 2-5 years old, amounting to 190 people from 26 Puskesmas in the work area of Banjarmasin City health office which has a Pink book (KIA Book). Samples used are 74 Balita Stunting and 116 Toddler Non-Stunting. Research design using Case-control method. The study was conducted from March 2016 to April 2017 with a span of 1 Year. Independent variables in this study include; birth weight, gestational age, length of birth, exclusive breastfeeding, and baseline immunization status, while the dependent variable in this study was stunting incident in under-fives. Instruments in this study used a checklist for retrospective data sources that included a history of birth weight, gestational age, length of birth, exclusive breastfeeding, and baseline immunization

status. As for the measurement of stunting done by measuring height and age based on Stunting assessment  $<-2$  SD and No Stunting  $\geq 2$  SD.

### III. RESULTS

#### A. Birth Weight Relationships Born with Stunting in Toddlers

Table 1 Weight History Relation Analysis Birth with Stunting Genesis in Toddlers

No	Birth Weight History	Stunting of Balita				Total	
		Stunting		No Stunting			
		n	%	n	%	N	%
1	BBLR	22	61,1	14	38,9	36	100
2	Normal	52	33,8	102	66,2	154	100
Total		74	38,9	146	61,1	190	100

p value : 0.032

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Table 1 shows that there are 61.1% children under five who have a history of low birth weight (LBW) and 38.9% of children without stunting who have a history of low birth weight (LBW).

Chi-square test results obtained  $p = 0.032$  means  $p \leq 0.05$ . with OR = 3,082 (1,069-8,886) in the risk estimate table seen the value of OR 3.082 mean the history of low birth weight has 3.1 times stunting compared to children of normal birth weight in Toddler.

#### B. Relationship Age of pregnancy with Stunting in Toddlers

Table 2 Relationship History Analysis of Gestational Age with Stunting Occurrence in Toddlers

No	Gestational Age	Stunting of Balita				Total	
		Stunting		No Stunting			
		n	%	n	%	n	%
1	Preterm	30	62,5	18	37,5	38	100
2	Aterm	44	31	98	69	142	100
Total		74	38,9	116	61,1	190	100
P value : 0,006							

P value : 0,006

Based on table 2 above, it can be seen that Toddlers born with gestational age preterm there are 30 people who experience stunting While toddlers born with germination a term age there are 44 (31%) people who experience stunting. The result of chi-square test obtained  $p = 0,006$  means  $p \leq 0,05$ , and result of OR = 3,712 (1,411-9,767) mean that preterm gestational age at pregnancy has 3.7 times risk of stunting during infancy compared to under-fives born from a history of gestational age at the term of pregnancy.

#### C. Long Body Relationships Born with Stunting in Toddlers

Table. 3. Relationship Analysis History of Long Body Born with Stunting Incidence in Toddlers

No	Long Body Born	Stunting of Balita				Total	
		Stunting		Tidak Stunting			
		n	%	n	%	N	%
1	Short	32	69,6	14	30,4	46	100
2	Normal	42	29,2	102	70,8	144	100
Total		74	38,9	116	61,1	190	100
P value 0,001							

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Based on table 3 shows that of 74 people experienced stunting and toddlers who were born with a normal birth weight there are 42 people. Toddlers who have to stunt. The result

of chi-square test obtained  $p = 0,001$  mean  $p \leq 0,05$ , and result of  $OR = 5.551$  (1.995-15.455) mean short birth length have 5,5 times more risk stunting than a child born with a history of normal birth length.

#### D. Exclusive Breastfeeding Relationship with Stunting in Toddlers

Table 4 Relationship Analysis of Exclusive Breastfeeding History with Stunting Occurrence in Toddlers

No	ASI o Eksklusif	Stunting of Balita				Total	
		Stunting		No Stunting			
		n	%	n	%	n	%
1	PASI exclusive	24	46,2	28	53,8	52	100
2	breastfeeding	50	36,2	88	63,8	138	100
	Total	74	38,9	116	61,1	190	100
P value 0,377							

Based on table 4 shows that there are 24 people under five who experience Stunting who get PASI and there are 50 Toddlers who have a history of Exclusive Breastfeeding who experienced stunting.

Chi square test results obtained  $p = 0,377$  means  $p > 0,05$ .

#### E. Relationship History Basic Immunization Status with Stunting in Toddlers

Table 5 Relationship Analysis of Basic Immunization Status History with Stunting Incidence in Toddlers.

No	History Basic Immunization	Stunting of toddlers				Total		P Value
		Stunting		No Stunting				
		N	%	n	%	N	%	
1	completed	18	56,2	14	43,8	31	100	0,120
	Not							
2	Completed	56	35,4	102	64,6	158	100	
	Total	74	38,9	116	61,1	190	100	
P value 0,120								

Based on table 5 above, it can be seen that infants who get basic immunization is not complete there are 18 children under five who have stunting and Toddlers with complete basic immunization there are 56 children under five who have to stunt. Chi-square test results obtained  $p = 0,120$  means  $p > 0,05$ .

## IV. DISCUSSION

### 1. Stunting Occurrence in Toddlers

Based on the results of research conducted in Banjarmasin City Area of 190 Balita, 116 children under five (61,1%) did not experience stunting and 74 people (38,9%) had to stunt.

Stunting is a deficit in height according to age, is a result of chronic malnutrition (chronic) so the child becomes short and height is not appropriate for his age even though at first glance the child is not skinny [11]. Factors related to stunting incidence in toddlers include birth weight, gestational age, length of birth, exclusive breastfeeding, child immunization history, energy and protein intake, history of infectious diseases, the age of first breastfeeding, gender, knowledge of mother and family social economy. [12-15]. According to the Nutrition in the First 1,000 Days State of the World's Mothers report in 2012, stunting events are influenced by the condition during 1000 days of life that is from the fetus in the stomach or when the woman is pregnant until the child is 2

years old and this time called the period of windows critical [16,]. In the infant childhood development of the brain or intelligence and rapid growth of body, so that at this time if not done adequate nutrition by pregnant women, exclusive breastfeeding and provision of MPASI and adequate nutritional intake until the child aged 2 years then the potential occurs stunting [ 17-18]

## **2. Birth Weight History**

Based on the results of research conducted in Banjarmasin City area found that there is a significant relationship between birth weight history with the incidence of stunting in infants.

This is related to maternal nutrition at the time of pregnancy is lacking, which causes food supply and oxygen obstructed, resulting in malnutrition in infants for the first time, which is shown with birth weight less than 2500 grams or Low Birth Weight or LBW [10]. LBW is also very susceptible to various infectious diseases. [11] The results of this study indicate that  $OR = 3.082$ , which means a low birthweight history has a 3.1 times greater risk of stunting than a normal-born child. This is also supported by research by Victory et al and S Keino et al who say that LBW is the most dominant risk factor associated with stunting events and has a risk of 5.87 times for stunting [12, 18]. Birth weight is closely related to fetal,

neonatal and post-neonatal mortality, infant and child morbidity and long-term growth and development so that the impact of low birth weight babies lasts from generation to generation so that children with a low birth weight will have anthropometric measures which are less on its development. [15,19].

Birth weight is a very significant risk factor for growth especially in the first 6 months of life because at this time the infant is susceptible to infectious diseases thus increasing the likelihood of stunting, low birth weight infants followed by inadequate food intake and health services and infections often occur in children during the growth period can cause the growth of children inhibited and eventually become short. [11] This study is also in line with the research of CN Rahmi et al (2016), which shows that low birth weight is a significant risk factor for the occurrence of stunting. This is because malnutrition is a major health problem in the community so that some interventions can be done to overcome it [12]. Health workers are particularly aware of the nutritional status of pregnant women, providing counseling and counseling through antenatal care and also working with nutritionists to improve the nutrition of children with stunting as well as providing health education to mothers and families about balanced nutrition to

reduce malnutrition in children -child.  
[19- 22].

adequate nutrition intake than normal  
growth will be overtaken. [13,17]

### 3. Gestational Age

Based on the results of research conducted in the Area Puskesmas Banjarmasin concluded that  $H_0$  rejected means there is a significant relationship between gestational age with the incidence of stunting in infants in the region of Banjarmasin South Kalimantan Province with the value of OR 3.712 means preterm gestational age has 3.7 times the risk of stunting compared to term gestational age. This is also in line with the research of Rahayu and Mira showing that the incidence of prematurity is also associated with stunting events at 6-12 months of age [23]. Infants born prematurely have a risk of having stunting 2 times greater than normal-born subjects. Growth in premature infants is delayed due to short gestational age and the presence of linear growth retardation in the womb. Similarly, research on Baby's Long Birth Risk factor suggests that women with preterm delivery have a risk of delivering babies with short-term infants shorter than 4 times mothers with the term a term birth [24]. Infants born enough months but less nutritional intake will also experience growth faltering, it will increase weight if coupled with exposure to infectious diseases, should premature babies who have growth faltering if give

### 4. Length of Birth

The results of research conducted in the Work Area Puskesmas Banjarmasin obtained results there is a significant relationship between the long history of the birth body with the incidence of stunting in toddlers with OR 5.551 means short-term body length has 5.5 times more risk of stunting compared to children whose length of normal birth. The length of the birth body is categorized as normal when the body length is  $\geq 48$  cm while the short category is  $<48$  cm [22]. This study is in line with what Ng M, Fleming T et al said that good nutrition during pregnancy is very important to support the growth of children who will be born [20]. Baby's longevity describes the baby's linear growth during the womb. A low linear measure usually indicates a lack of nutrients due to lack of energy and protein suffered in the past. [3] Research on Risk Factors of Stunting Incidence in Toddlers Age 12 Months indicates that gestational age is a risk factor for stunting incidence in children aged 12 months (p-value:  $0.002 < 0.05$ ) babies born with short body lengths have a chance to grow shorter than normal birth children. Children with short-term lengths indicate a lack of maternal intake during pregnancy so that fetal growth is not optimal. Adequate

intake of nutritional and nutritious foods will affect the child's condition at the age of the child. [18, 21]

### **5. Exclusive breastfeeding**

The results of research conducted in the Work Area Puskesmas Banjarmasin get results that with the Hypothesis shows that there is no relation history of exclusive breastfeeding with stunting events in toddlers in the area of the city of Banjarmasin South Kalimantan Province. This research is not in line with Arifin et al's research on Spread Analysis and Stunting Risk Factors in Under-Fives in Purwakarta Regency. The result of the statistical test is obtained  $p\text{-value} = 0.0001$ , it is concluded that there is a relationship between breastfeeding with stunting event, while the result of the analysis in this research obtained by  $OR = 3,7$  means that toddlers with exclusive breastfed have a risk 3.7 times greater stunting than toddlers with Exclusive Breast Milk. [4]. This study is in line with other studies that show that Exclusive Breast is not a risk factor for stunting events in infants [18]. As it is known that the function of breast milk that is as an anti-infection that can affect stunting status changes in infants and also the length of breastfeeding is lacking and feeding or formula milk too early may increase infections such as diarrhea and ISPA [17]. Breast milk has many advantages overnutrition during toddlers

that can help to establish normal growth in Toddlers [13] Breast milk is needed by infants for food at the age of Baby 0 to 6 months but the growth of a person is much influenced by food intake at the time of growth. [22]

### **6. Basic Immunization Status**

Based on the results of research conducted in Banjarmasin City Work Area obtained results with the accepted hypothesis which means there is no relationship of basic immunization status with stunting incidence in toddlers. Immunization is an attempt to provide immunity to infants and children against certain diseases so as not to get the disease and if the disease is not fatal [9]. Immunization status in children is an indicator of contact with health services. Immunization status is expected to have a positive effect on long-term nutritional status [15]. In this study toddlers who get complete basic immunization and parents are aware of the importance of immunization for the health and growth of their children. Immunization is one of the efforts undertaken to improve the body's immunity if the body's immunity decreases can cause the body susceptible to infectious diseases and will inhibit the growth and development of children that can cause children to experience stunting [3.6].



## V. CONCLUSION

A low birthweight baby's history, preterm gestational age, and less than normal body length were factors that influenced the Stunting event. While the history of exclusive breastfeeding and primary immunization has no relationship with the incidence of stunting.

## VI. REFERENCES

- [1] Kementerian Kesehatan Republik Indonesia Direktorat Jendral Bina Gizi dan Kesehatan Ibu dan Anak, *Standard Antropometri Penilaian Status Gizi Anak*. 2013.
- [2] Martorell R & Zongrone An Intergenerational influences on child growth and undernutrition. 2012 *Pediatr Perinat Epidemiol* 26, 302–314.
- [3] Victora CG, de Onis M, Hallal PC et al. Worldwide timing of growth faltering revising implications for intervention using the World Health Organization growth standards. 2010. *Pediatrics* 125, e473–e480.
- [4] Arifin et al. *Analisis Sebaran dan Faktor Risiko Stunting pada Balita di Kabupaten Purwakarta 2012* [Cited 2017 January 2017]. Tersedia pada: [http://repository.unpad.ac.id/1653/1/1/pustaka\\_unpad\\_analisis\\_sebaran\\_dan\\_faktor\\_risiko\\_stunting.pdf](http://repository.unpad.ac.id/1653/1/1/pustaka_unpad_analisis_sebaran_dan_faktor_risiko_stunting.pdf)
- [5] Kementerian Kesehatan Republik Indonesia. 2016. *Profil Kesehatan Indonesia.2015*. Jakarta.
- [6] Badan Penelitian dan Pengembangan Kesehatan KKRI. Laporan Hasil Riset Kesehatan Dasar ( RISKESDAS) Indonesia Tahun 2013. In: Indonesia DK, Editor. Jakarta, Indonesia: CV Kiat Nusa; 2014
- [7] City Health Office Banjarmasin 2016. Health Profile Banjarmasin Banjarmasin City.
- [8] Marmi. Nutrition in Reproductive Health. Yogyakarta: Pustaka Pelajar. 2013
- [9] Ministry of Health Republic of Indonesia Maternal & Child Health. Standard of Pregnancy Service. 2013
- [10] CN Rahmi, KE Agho, M Li et al. Stunting, Underweight and overweight in children aged 2.0-4.99 years in Indonesia: prevalence trends and associated risk factor. 2016. *PLoS One* ( In The press)
- [11] Anugraheni HS & Kartasurya MI. Risk Factors Stunting Occurrences In Children Ages 12-36 Month In Pati District, Pati Regency. Nutrition Science Program Faculty of Medicine Diponegoro University. [Cited 2017 May 2016]. Available at: <https://core.ac.uk/download/pdf/11736638.pdf>
- [12] S Keino, G plaque, G Pattaya et al, Determination of stunting and overweight among young children and adolescents in sub- Saharan Africa. 2014, *Food Nutr Bull* 35, 167-178.



- [13] J Armstrong & JJ Reilly: Child Health Information team ( team) Breastfeeding and lowering the risk of childhood overweight in a large Chinese cohort. *J Nutr* 144, 1454-1459.
- [14] M de Onis, K Dewey, E Borghi et al. The World Health Organization's global target for reducing action. Childhood stunting by 2015: rationale and proposed action. *Matern Child Nutr* 9, Suppl.2,6-26
- [15] WHO. *Global Nutrition Targets 2015 Stunting Policy Brief*. [Cited 2017 Januari]. Tersedia pada: [http://www.who.int/nutrition/topics/globaltargets\\_stunting\\_policybrief.pdf](http://www.who.int/nutrition/topics/globaltargets_stunting_policybrief.pdf)
- [16] Johnson M, Inc and Brookstone. *Nutrition in the First 1,000 Days State of the World's Mothers 2012. Save The Children*. [Cited 2017 Mei ]. Tersedia pada: [www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74%D/STATE-OF-THE-WORLDS-MOTHERS-REPORT-2012-FINAL.PDF](http://www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74%D/STATE-OF-THE-WORLDS-MOTHERS-REPORT-2012-FINAL.PDF)
- [17] JS Zheng, H Liu, J Li et al. Exclusive breastfeeding is inversely associated with the risk of childhood overweight In a large Chinese cohort.2014. *J Nutr* 144, 1454-1459
- [18] GS Marquis, JP Habicht, CF Lanata et al. Association of breastfeeding and Stunting in Peruvian toddlers: an example of reverse causality.1997 *Int J Epidemiol* 26, 349-359.
- [19] Nutrition SU. Scaling Up Nutrition Movement: Indonesia [Cited 2016 Nopember]. Available from: [HTTP://scalingupnutrition.org/sun-countries/Indonesia](http://scalingupnutrition.org/sun-countries/Indonesia).
- [20] Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, et al. Global, Regional, and National Prevalence of Overweight and Obesity in Children and Adults during 1980-2013: a systematic analysis for The Global Burden of Disease Study 2013. *Lancet*. 2014;384(9945):766-81.doi:10.1016/S0140-6736(14)60460-8.pmid:24880830.
- [21] World Health Organization. Report of the First Meeting of the Ad Hoc Working Group On Science and Evidence for Ending Childhood Obesity. Geneva, Switzerland: World Health Organization, 2014.
- [22] Rahayu LS, Mira S. Influence of LBW and Exclusive Breastfeeding on Stunting Status Changes In toddlers in Tangerang City and district of Banten Province (cited 2017 March) Available on; <http://vi.scribd.com/doc/181874486/leni-19-pdf-pdf>.