

## **RISK FACTORS IN THE EVENT OF STUNTING CHILDREN AGE 24-59 MONTHS (CASE STUDY IN KELURAHAN BALAI GADANG, HEALTH CENTER OF AIR DINGIN PADANG CITY IN 2015)**

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### **Abstract**

Stunting reflects chronic undernutrition during the most critical periods of growth and development in early life. Data from health department of Padang in 2013 showed the prevalence of stunting in the region of Health Center Air Dingin was 43.3%. The aim of research is to determine the risk factors of stunting children aged 24-59 months in Kelurahan Balai Gadang, Health Center of Air Dingin Padang city in 2015. This research is a retrospective case control study. The study was conducted in April-May 2015 in Kelurahan Balai Gadang, Health Center of Air Dingin. The total samples were 90 children with aged 24-59 months. The data about the immunization status, birth weight, exclusive breastfeeding status, number of family members, mother's education, mother's occupation were obtained using questionnaire (primary data). Collecting data sanitation and water sources with direct observation in the home of the respondents (primary data). The anthropometric data and age were obtained from Health Centers of Air Dingin (secondary data). Sampling in the case group was done by using simple random sampling and calculated based on the formula and obtained as many as 45 children aged 24-59 months. The selected control group is children aged 24-59 months are normal nutritional status with same in gender. The number of children in the control group was similar to the case. Data was analyzed by univariate. Bivariate analysis used Chi-Square test. In the case group there as much as 75.6% children are not fully immunized. 26.7% children with low birth weight. 68.9% children were not given exclusive breastfeeding. 40% of infants with a large number of family members. 64.4% children with low maternal education. 2,2 % of children with working mothers. 55,6% family do not have basic sanitation. 37,8% family do not have a protected water source. In the control group there as much as 35,6 % are not fully immunization. 6,7 % children with low birth weight. 48.9% children were not given exclusive breastfeeding. 24,4% of infants with a large number of family members. 28,9 % children with low maternal education. 6,7% of children with working mothers. 22,2% family do not have basic sanitation. 28,9% family do not have a protected water source. Statistical analysis showed risk factors for the incidence of stunting children aged 24-59 months are immunized (OR = 5,6), birth weight (OR=5,02), maternal education (OR = 4,46), and basic sanitation (OR = 4,3) which was obtained  $p < 0.005$ . While the status of exclusive breastfeeding, the number of the members of family, work and the source of water were not a risk factor for the incidence of stunting. Although exclusive breastfeeding is not a risk factor for the occurrence of stunting, but there is the tendency, so the need for counseling to mother's children to give baby's exclusive breastfeeding aged 0-6 month.

**Keywords:** Stunting, children Ages 24-59 Months, immunization, birth weight, maternal education, and Basic Sanitation.

### **BACKGROUND**

Stunting is one of the nutritional problems that occur in Indonesia. Stunting is based on the nutritional status of the index Height for Age (TB / U) with a threshold (Z-score)  $< -2$  standard deviation (SD). The impact of stunt-

ing is not only felt by the individual who experienced it but also have an impact on the economy and development of the nation. This is because the resources stunting in persons who have a lower quality than the normal human resources (Ministry of Health, 2011).



Prevalence of stunting in children under five worldwide in 2007 was 28.5%, and in all developing countries by 31.2%. Asian continent have toddlers prevalence of stunting of 30.6%, the incidence is higher than the prevalence of stunting infants in Latin America and the Caribbean, amounting to 14.8%. Prevalence of stunting in Southeast Asia was 29.4%, higher than in East Asia, 14.4%. While the prevalence of stunting in children under five was 20.9% Western Asia (The Lancet's 2008 in Anisa 2012).

Data of Riskesdas in 2013 by presenting national stunting prevalence was 37.2%, which means an increase compared to 2010

is 35.6. Short prevalence of 37.2% consisted of 18.0% and 19.2% very short short. While the prevalence of stunting in children under five in 2013 in the province of West Sumatra are 39%.

Data Riskesdas in 2013 nutritional status indicators based on the combined H/A and W/H presents the prevalence of nutritional status of 48.6% of normal. 2.5% Short-thin toddlers, toddler 27.4 Short-normal, short 6.8-fat, normal toddler-thin 9.6 and 5.1 normal-fat toddlers. From these data it contained 51.4% children have problems of nutrition, namely nutrition, stunting, and malnutrition (wasted).

Stunting is not only caused by one factor, but is caused by many factors, which factors are interrelated to one another. Broadly speaking, the causes of stunting can be grouped into three categories: community level, household (family) and individuals. At the community level economic system, education, sanitation and clean water into the causes stunting. At the household level (family), the quality and quantity of food is inadequate, income level, number and structure of family members, basic health services are inadequate, sanitation and clean water are not sufficient to be a factor causing stunting. Factors that occurred in the household will affect the individual's circumstances, namely in the food intake is not balanced, low birth weight (LBW), and poor health status (Unicef framework).

Data from the Health Department of of Padang city in 2013, Health Center of Air Dingin has nutritional status of children based on the index TB / U is 46.67% children with normal , 35% of children with stunting and 8:33% with severe stunting. **The purpose** of this study to determine the incidence Risk Factors Stunting In Children Ages 24-59 Months In Kelurahan Balai Gadang Health Center of Air Dingin Padang City in 2015.

## METHODS

This is observational study using case control design Factors related to the occurrence of stunting seen retrospectively in both groups. This study was conducted in April-May 2015 in Kelurahan Balai Gadang Health Center of Air Dingin Padang City.

The case group was a toddler at in Kelurahan Balai Gadang Health Center of Air Dingin Padang City who has stunting. Samples taken randomly in mothers who have children under the age of 24-59 months as many as 45 children. Determination of the number of samples with the formula Lemeshow (1997). In the control group sought similarities between cases and controls. Equation performed on confounding variables. The variable that is gender confused because it affects the incidence of stunting in children under five.

Data processing is performed by using a computer with SPSS program with two stages: Univariate analysis to obtain a description of each variable, are presented in tabular form and frequency. Bivariate analysis performed by Chi-Square test to determine the relationship between variables. If the p-value of <0.05 indicates that there is a significant relationship between the dependent and independent variables. Determination of the relative risk is calculated indirectly by using the Odd Ratio (OR).



**RESULTS**

Table 1. Frequency Distribution of Respondents by Age Group

Ages (months)	Responden			
	Case		control	
	n	%	n	%
24 – 36	17	37,8	17	37,8
37 – 48	15	33,3	18	40
49 – 59	13	28,9	10	22,2
Total	45	100	45	100

Table 2. Frequency Distribution of Respondents by Gender

Gender	Responden				Total	
	Case		Control		n	%
	n	%	n	%		
Male	23	50,0	23	50,0	46	51,1
Female	22	50,0	22	50,0	44	48,9
Total	45	100	45	100	90	100

**DISCUSSION**

Table 3. Frequency Distribution Variables affecting Genesis Stunting

Variable	Kategori	Responden				Total	
		Case		Control		n	%
		N	%	n	%		
immunization	Incomplete	3	75	1	35	5	55
	Complete	4	,6	6	,6	0	,6
Birth Weight	Low Birth Weight	1	24	2	64	4	44
		1	,4	9	,4	0	,4
	Normal	3	73	4	93	7	83
Exclusive breast-feeding	Non Exclusive breast-	3	68	2	48	5	58
		1	,9	2	,9	3	,9

feeding	Exclusive breast-feeding	1	31	2	51	3	41
		4	,1	3	,1	7	,1
Number of Family Members	Pretty	2	60	3	75	6	67
	Big	7		4	,6	1	,8
maternal education	Low	1	40	1	24	2	32
	Hight	8		1	,4	9	,2
maternal employment status	Do not work	2	64	1	28	4	46
	Work	9	,4	3	,9	2	,7
basic sanitation	Sanitation	1	35	3	71	4	53
	No Facility of Sanitation	6	,6	2	,1	8	,3
water sources	Protecte d	4	97	4	93	8	95
	Not Protecte d	4	,8	2	,3	6	,6
basic sanitation	Sanitati on	1	2,	3	6,	4	4,
	No Facility of Sanitation	2	2,	3	6,	4	4,
water sources	Protecte d	2	55	1	22	3	38
	No Facility of Sanitation	5	,6	0	,2	5	,9
water sources	Protecte d	2	44	3	77	5	61
	Not Protecte d	0	,4	5	,8	5	,1
water sources	Protecte d	1	37	1	28	3	33
	Not Protecte d	7	,8	3	,9	0	,3
water sources	Protecte d	2	62	3	71	6	66
	Not Protecte d	8	,2	2	,1	0	,7

Complete basic immunization coverage in children who suffer from stunting that is equal to 24.4%. This achievement is lower than the desert town immunization coverage in 2014 amounted to 41.3%. While in children with normal height immunization coverage is 64.4%. This achievement has surpassed the achievement of the province of West Sumatra and Indonesia 41.4% 48.4% (Kemenkes RI, 2014).

The results showed in the case group of respondents with Low BirthWeight conditions more (26.7%), compared to the control group (6.7%). Meanwhile, the percentage of respondents in the control group with normal



birth weight more (93.3%), as compared with the cases (73.3%). The description above shows that the percentage of normal birth weight in cases and controls were found by researchers is much greater than the incidence of LBW in the desert city in 2012 amounted to 0.6% (Health Office of Padang City, 2012).

Exclusive breastfeeding in children who suffer from stunting in the amount of 31.1%. This achievement is lower than coverage of exclusive breastfeeding West Sumatra in 2014 amounted to 72.5%. While the group of children with normal height achievement Exclusive breastfeeding is 51.1%, as well as yet to reach the target of West Sumatra (Health Office of West Sumatra provincial , 2014).

The results showed in the case group of respondents who do not have basic sanitation more (55.6%), compared with the control group (22.2%), while the control group of respondents who have basic sanitation more (77.8%) , compared with cases (44.4%).

Percentage of households with access to basic sanitation complete in children who suffer from stunting in the amount of 44.4%, this achievement is lower than the percentage in the city of Padang 65.5% and 49.9% of West Sumatra province. (Risksedas, 2013).

The results showed in the case group of respondents who do not have a drinking water source protected more (37.8%), compared with the control group (28.9%). Meanwhile in the control group of respondents who have a more protected water sources (71.1%), as compared with the cases (62.2%).

Table 4. Risk Factors Genesis Stunting In Toddlers

No	Risk Factor	OR	95% (CI)	p - Value
1	Imunization status	5,60 2	2,24- 13,96	0,000
2	Birth Weight	5,09 1	1,32- 19,53	0,024
3	Giving Exclusive breastfeed-	2,31 5	0,97- 5,47	0,086

	ing			
4	Number of Family Members	0,48 5	0,19- 1,19	0,175
5	maternal education	4,46 2	1,83- 10,84	0,002
6	maternal employment status	3,14 3	0,31- 31,42	0,616
7	basic sanitation	4,37 5	1,75- 10,93	0,003
8	water sources	1,49 5	0,61- 3,61	0,503

Based on research conducted on the cases turned out to be incomplete immunization status was higher (75.6%) compared to the control group (35.6%). Respondents with incomplete immunization status has a chance to suffer 5.6 times more at risk of stunting compared to respondents with complete immunization satus (Odd Ratio (OR): 5.602; 95%).

The results are consistent with research conducted by Wiyogowati (2012) in the province of West Papua that toddlers who do not complete the immunization will have 2,128 risk will experience the incidence of stunting compared to children who complete immunization. Another study carried out Henderson (2013) in the city of Banda Aceh found that toddlers who do not complete the immunization will have a four times greater risk to experience stunting incidence. But unlike the research conducted by Chandra et al (2011) which states that immunization is not a risk factor for the incidence of stunting (p = 0.067).

From interviews using questionnaires, incomplete immunization in infants caused by fear of needles so that the child will be a toddler in question is not brought to the Posyandu, parents fear their children sick after immunization, and the lack of parental knowledge about immunization.

Basically immunization of children has an important purpose, namely to reduce the risk of morbidity (illness) and mortality (death) child due to diseases that can be prevented by immunization (Narebdra, 2002).

Immunization status in children is one indicator of contact with the health service, because it is expected that the contact with the health service will help improve nutrition problems, boosting immunization status is also expected to have a positive effect on the long-term nutritional status. (Yimer, 2000).

Respondents with low birth weight has a chance 5 times more likely to suffer stunting compared to respondents that normal birth weight (odds ratio (OR): 5.091; 95%), statistical test obtained by value  $p = 0.024$  ( $p < 0.05$ ). it can be concluded that birth weight is a risk factor for the incidence of stunting. This research as well as research conducted by Fitri (2012). In Sumatra based data analysis Riskesdas 2010 states that infants with low birth weight condition have 1.7 times the risk of suffering from stunting compared to children with normal birth weight. Another study conducted by Aptiarni (2013) in the hill districts Sundi solok district stating that toddlers with conditions of low birth weight have a chance to experience stunting of 15.8 times compared to infants born with normal weight. But unlike the penelian Hana (2012) which states that the birth weight was not a risk factor for the incidence of stunting ( $p = 0.195$ ).

In developing countries, infants with low birth weight (LBW) is more likely to have intrauterine growth retardation that occurs due to poor maternal nutrition and increase the infection rate compared with developed countries (Heningham & Anisa McGregor in 2012). Impact of babies have low birth weight will take place between generations that the next kegenerasi. LBW children who in the future will have less anthropometric measure in adulthood. Another theory states that mothers with less nutrition from the beginning until the end of pregnancy will give birth to low birth weight. Low birth weight babies are accompanied by inadequate food intake, inadequate health services, and a common infection in children during infancy cause stunting and produce child stunting (ACC / SCN, 2000).

Exclusive breastfeeding risk factors against genesis stunting based on table 4 test result with a value of  $p = 0.086$  ( $p > 0.05$ ),

although the number of children with stunting more in the case group were not given exclusive breastfeeding, but the chi-square test results showed no association. it can be concluded that exclusive breastfeeding is not a risk factor Stunting in children aged 24-59 months.

The results support the findings of the data Husein (2013) in the Eastern District of Semarang states that exclusive breastfeeding is not a risk factor for the incidence of stunting. However, in contrast to a study conducted by Smith (2012) which states that exclusive breastfeeding is a risk factor for the incidence of stunting ( $p = 0.001$ , OR = 2.2).

Results of the data analysis conducted by researchers in contrast to the findings of the WHO (2007) which states that exclusive breastfeeding can reduce the risk of incidence of stunting, because the calcium content in milk has a high bioavailabilitas so that it can be absorbed optimally, especially in bone formation function of children. Risk Factors Number of Family Members Against Genesis Stunting. Based on Table 4 are known statistical test result with a value of  $p = 0.175$  ( $p > 0.05$ ). It can be concluded that the number of family members is not a risk factor Stunting in children aged 24-59 months. Results of this research together with research conducted by Yulestari (2013) which analyzed data Riskesdas in 2010 on the island of Java. Stating that there was no significant relationship between the number of family members with Stunting incident. These results are also consistent with previous research which states that there is no significant relationship between the number of family members with the incidence of stunting (Roudhotun, 2012). However, in contrast to the findings of this study Chandra (2012) which states that the number of family members are risk factors for the incidence of stunting with a risk 3.5 times.

In the case of the group of respondents with low maternal education more (64.4%) compared to the control group (28.9%). Respondents with low maternal education has a chance 4.462 times more likely to suffer stunting compared to his mother's high school respondents (Odd Ratio (OR): 4.462;



95%). From the analysis of statistical test obtained by value  $p = 0.002$  ( $p < 0.05$ ). So it can conclude maternal education is a risk factor for the incidence of stunting.

The results support the findings of the data-Fitr (2012) in Sumatera based data analysis Riskesdas 2010 which states that there is a significant relationship between mothers with low education with the incidence of stunting. Toddlers who have mothers with low education had 1.4 times the risk of experiencing stunting compared to children whose mothers higher education, this result is also the same as previous studies stating the category of low maternal education were significantly associated with the incidence of stunting (Nadiyah, et al. 2014 & Siti. 2012).

The following are several theories to support the research that suggested a link between maternal education with the incidence of stunting in children under five. Educated mothers are more likely to make decisions that will improve the nutrition and health of their children. In addition, educated mothers are more likely to send all their children to break the chains of ignorance, and it would be better to use strategies for his life, such as breastfeeding, immunization, and family planing, therefore, educated mothers may play a role in reducing the prevalence of malnutrition (Senbanjo 2011 in Anisa 2012). In addition to a good education, it is estimated that the mother also has a good knowledge of nutrition. Mothers with good nutrition knowledge will know how to prepare food, set menu, as well as maintaining the quality and hygiene of food well (Lauria et al. 2005).

Results of this research together with research Sulastri (2012) in the district of Padang city Kilangan Lubuk. Which states that there is no significant relationship between maternal employment status with the incidence of stunting. Mothers work related to parenting and family economic status. Mothers who work outside the home can cause a child not maintained, because toddlers are very dependent on guardians or other family members (Diana, 2006). Working mothers can also help the family entry, because employment is an important factor in determining the quality and quantity of food.

The incidence of stunting in children under five sub Hall Tower is more common among women who do not work can be caused due to the economic status of the family in women who do not work tend to be low. Although mothers who do not work have a lot of time to care for her child. If it is not followed by good economic status to support the needs of toddlers, it is not necessarily a good effect on the nutritional status of children.

Respondents were no basic sanitation has a chance 4.375 times more likely to suffer stunting compared to respondents who have basic sanitation (Odd Ratio (OR): 4.375; 95%). From the statistical test results obtained value of  $p = 0.038$  ( $p < 0.05$ ). So we can conclude Basic Sanitation is a risk factor for the incidence of stunting.

The results support the findings of the data Nadiyah, et al (2014) in the province of Bali, West Java and East Nusa Tenggara which states that there is a significant correlation between basic sanitation with the incidence of stunting ( $p = 0.03$ ). Another study conducted by Yulestari (2013) also stated the same thing that there is a significant correlation between basic sanitation with the incidence of stunting ( $p = 0,001$ ) with OR = 1.3.

Sanitation and hygiene factors affect the environment as well as to the health of pregnant women and child development, because children under two years of age are susceptible to various infections and diseases. Poor sanitation and environmental hygiene trigger digestive tract disorders, so that energy is diverted to the resistance to the growth of the body for infection (Schmidt, 2014 in the 1000 motion HPK).

Water Resources Risk Factors Against Genesis Stunting. This research together with research Rosha et al (2013) which states that there is no significant relationship between the water source to the incidence of stunting. But unlike the research conducted by Oktarina and Sudarti (2013) states that the source of drinking water is a risk factor for the incidence of stunting (OR = 1.36).

This study is not in accordance with the theory that water and sanitation have a relationship with the child's growth. Children



who come from homes that do not have water and sanitation facilities are either at risk of stunting. While children who have normal height generally come from households that have water and sanitation facilities are good. In children who initially had stunting, if they come from households that have water and sanitation facilities is good, then they have a chance of 17% to reach normal height when compared to children stunting who came from households that have water and sanitation facilities are poor (Merchant et al, 2003 in Oktarina 2012).

## CONCLUSION

Toddlers with incomplete immunization status is more common in the case group. Infants with low birth weight is more common in the case group. Toddlers are not given exclusive breastfeeding is more common in the case group. Toddler with a large number of family members to be more prevalent in the case group. Infants with low maternal education were more common in the case group. Infants with mothers who do not work are more common in the case group. Basic sanitation facilities are more common in the case group. Unprotected water sources are more common in the case group.

Risk factors for the incidence of stunting is immunization status (OR = 5.602), birth weight (OR = 5.091), maternal education (OR = 4.462), and basic sanitation (OR = 4.375). While exclusive breastfeeding, family size, maternal occupation and source of water is not a risk factor for the occurrence of stunting.

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