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Reseach Article,

Relationship between Low Birth Weight and Stunting In Children Aged 6-24 Months in the Working Area of the Air Dingin Health Center

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Abstract:

Background: Low birth weight (LBW) is defined as a birth weight of less than 2500 g (up to and including 2499 g). LBW generally experience an unfavorable future life, babies born with low birth weight are mostly born to mothers with low nutritional status during pregnancy who are at risk of becoming stunted.

Aim: To determine the relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the Working Area of the Air Dingin Health Center, Padang City.

Method: The research was conducted in the Working Area of the Air Dingin Health Center in Padang, from May 2019 – January 2020. This is a correlative analytic study with a cross-sectional research design. The affordable population is part of the target population of children aged 6-24 months in the Air Dingin Health Center Padang with 65 samples using stratified random sampling technique. The analysis data using chi-square test SPSS version 24.0.

Results: Based on the results of the study, the most gender was male, 21 people (53.8%), the most age was 12 - <24 months, 38 people (97.4%), experienced stunting as many as 39 people (60%), experienced LBW as many as 27 people (41.5%) and there is a relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the Working Area of the Air Dingin Health Center, Padang ($p=0.027 < 0.05$)

Conclusion: There is a relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the Working Area of the Air Dingin Health Center in Padang.

Keywords: *Stunting, LBW, Gender, Age*

Preliminary:

Indonesia is a developing country that has complex problems, especially in nutritional problems. Today, stunting as a part of malnutrition chronic in childrens has an emergency problem. Stunting can be at risk of disease and death, children who survive tend to have poor performance in school. But not many parents are aware that their child is suffering from stunting.[1,2]

WHO in 2018 showed that 149 million children under five, 22% were stunted. Africa and Asia are the two continents with the highest incidence of stunting under five in the world with percentages of 39% and 55% respectively. Indonesia is included in the top 10 countries with the highest prevalence of stunting under five in Southeast Asia along with other countries, namely Timor Leste, Nepal, India, Bangladesh and Myanmar.[3,4]

Improvements in nutritional problems are also stated in the 2015-2019 National Medium Term Development Plan (RPJMN) target with a stunting prevalence target of 28%.5 However, in reality the results of the Basic Health Research (Riskesdas) show an increase in stunting prevalence of 1.6%, from 35 .6% in 2010 to 37.2% in 2013.[6] Meanwhile, in 2018 showed a decrease in the incidence of stunting by 30.8%.[7] Although there has been a decline in the incidence of stunting in Indonesia, the prevalence of stunting is still high,

which means children's problems Short nutrition is still a big problem in Indonesia and requires attention from various parties to overcome it.

The prevalence of stunting under five in West Sumatra in 2016 was 25.6%.8 Monitoring the Nutritional Status (PSG) of children under five, this incident increased in 2017 by 30.6%, which was categorized as short 21.3% and very short 9.3 %.[7] Padang City Health Office annual report from 2013 to 2018 there was a decline in stunting prevalence. In 2013 the prevalence of stunting was recorded at 28.3%.[9] This was a significant decrease in 2018 by 11.2%. The Air Dingin Health Center area is one of the areas with the highest incidence of stunting in the city of Padang at 17.5% in children aged 6-24 months.[10]

Factors that affect stunting include low birth weight (LBW), lack of protein energy, chronic disease, poor food intake, poverty factors and inadequate child care.[11] The process of stunting starts from 6 months and appears mainly in the first two years of life or also known as the First 1000 Days of Life. This period is an important period in determining the quality of life of children.[12] Infants with low birth weight (LBW) are predictors of the strongest incidence of stunting.[13] Babies born with low birth weight are mostly born to mothers with low nutritional status during pregnancy who later are at risk of becoming stunted.[14]

Low birth weight is a baby born weighing less than 2500 grams. LBW generally experience an unfavorable future life.[15] The incidence of LBW in Padang City 2016 was 2.10%, and decrease in 2017 was 1.5%.[16]

Research conducted by El Taquri, Adel et al in Libya also showed that LBW had a 1.8 times risk of becoming stunted.[17] This is in line with research in South India conducted by Andrea M Rehman et.al which showed that children with low birth weight has a 3.6 times risk of becoming stunted at the age of 3 years.[18] Nasution's research, children with a history of LBW have a 5.6 times risk of experiencing stunting compared to children born with normal weight.[19]

The results of the initial survey data on the incidence of stunting in the Air Dingin Health Center area at the age of 0-24 months there were 98 children. Researchers want to take data on children aged 6-24 months because according to the title, the relationship between LBW children and stunting can be seen at the age of 6-24 months, because if it is more than 24 months there are many other factors that can cause stunting. In the area of the Air Dingin Health Center, there are 3 villages, namely Aia Pacah Village, Lubuk Minturun Village, and Balai Gadang Village.

Research Methods:

The scope of this research is Pediatrics. The research was conducted in the Working Area of the Air Dingin Health Center, Padang.

The research sample is children aged 6-24 months who visited the Air Dingin Health Center Work Area. We measure the child's height using the length board. The measurement results are entered into the Z score chart for body length/age. Data analysis was carried out univariate and bivariate using chi-square test. The value used to see whether there is a relationship between the two variables is p (probability), then it is said to be significant if $p < 0.05$.

Research result:

This study aims to determine the relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the working area of the Air Dingin Health Center. There were 65 research samples that met the inclusion and exclusion criteria. Based on the results of the collection and analysis of the data that has been obtained, the authors can conclude the results of the research in the exposure below:

A. Characteristics of Respondents

Based on the characteristics of the respondents, the age and sex of children. The results showed that the frequency of respondents' characteristics according to gender in the Working Area of the Air Dingin Health Center in Padang can be described as follows:

Table 1. Frequency Distribution of Respondents Characteristics

According to Gender in the Working Area of the Air Dingin

Gender	Stunting Incident			
	No Stunting		*Stunting*	
	f	*%*	*F*	*%*
Girls	12	46.2	18	46.2
Boys	14	53.8	21	53.8
Amount	26	100	39	100

Health Center Padang. Based on table 1, it was obtained from 39 stunting children, the most gender was male, 21 people (53.8%).

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Table 2. Frequency Distribution of Respondents Characteristics

Age	Stunting Incident			
	No Stunting		*Stunting*	
	f	*%*	*F*	*%*
6-<12 months	8	30.8	1	2.6
12-<24 months	18	69.2	38	97.4
Amount	26	100	39	100

Based on table 5.2, the results were obtained from 39 stunted children, the most ages were 12 - <24 months, namely 38 people (97.4%).

B. Univariate Analysis

In the following, an analysis of each variable is presented, namely low birth weight with the incidence of stunting in children aged 6-24 months in the working area of the Air Dingin Health Center in Padang with a table description as follows:

1. Stunting

The results of the study found that the frequency of stunting in children in the Air Dingin Health Center's Padang can be described as follows:

Table 3. Frequency Distribution of Respondents Based on Stunting in Children in the Working Area of the Air Dingin Health Center, Padang City

Stunting	*F*	*%*
Not stunting	26	40.0
Stunting	39	60.0
Total	65	100

65 children, experienced stunting as many as 39 people (60%).

2. LBW

The results of the study found that the frequency of LBW in the Air Dingin Health Center's Padang working area can be described as follows:

Table 4. Frequency Distribution of Respondents Based on LBW in Children in the Working Area of the Air Dingin Health Center, Padang City

LBW	*f*	*%*
Not LBW	38	58.5
LBW	27	41.5
Total	65	100

Based on table 4, the results obtained from 65 children, experiencing LBW as many as 27 people (41.5%)

Bivariate Analysis

In the following, the results of research on the relationship between low birth weight and the incidence of stunting in children aged 6-24 months are presented in the Working Area of the Air Dingin Health Center in Padang City in the table below:

Table 5. Relationship of Low Birth Weight with Stunting Incidence in Children aged 6-24 Months in the Working Area of Air Dingin Health Center, Padang City

LBW	*Stunting*				Amount		*P* Value
	No Stunting		*Stunting*				
	F	*%*	*F*	*%*	*N*	*%*	
Not LBW	20	52.6	18	47.4	38	100	**0.027**
LBW	6	22.2	21	77.8	27	100	
Total	**26**	**40**	**39**	**60**	**65**	**100**	

Based on table 5 shows that of the 27 children who experienced LBW, the most experienced stunting, 21 people (77.8%) while out of 38 children who did not experience LBW, there were 18 people (47.4%). The results of the statistical test (chi-square) obtained a value of p = 0.027 (p <0.05), it can be concluded that there is a relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the Air Dingin Health Center in Padang City.

Area, the results showed that the highest number of stunting occurred in girls. that is 54.84%.32 Baby girls can survive in large numbers than baby boys in most developing countries including Indonesia.22 Boys have more muscle tissue and less fat tissue than girls. Metabolically, muscle requires more energy than fat. Thus, men and Women with the same height, weight and age have different body compositions, so their energy and nutritional needs will also be different.23

In the first year of life, male are more susceptible to malnutrition than females. This is due to the large size of the male body so that if food intake is not met and this condition occurs for a long period of time it can increase growth disorders (stunting).24 However, in the second year of life, girls are more at risk of becoming stunted. This is related to women having less physical activity so that growth is not optimal and the parenting pattern of parents in feeding their children.25 Both men and women have a probability of becoming stunted. However, with good parenting, stunting

can actually be prevented. In the Working Area of the Padang City Air Dingin Health Center, although the number of men is more than the number of women, the proportion of children under five who experience stunting is almost the same, namely 53.8%. This may be due to the lack of parenting for children for both boys and girls

A. Age

Based on the research, the results obtained from 65 children who experienced stunting, namely 39 children, the most age was 12 - <24 months, namely 38 people, 97.4% in children aged 6-24 months in the Working Area of the Air Dingin Health Center in Padang City. This research is supported by previous research conducted by Putra's research in 2015 on children aged 12-60 months in the Pauh Health Center Work Area, the results obtained were the most stunting at the age of 12-24 months, namely 35.48% and also research conducted by Dewi in 2018 for baduta in Maron Kidul Village, Maron District, Probolinggo Regency, the results obtained were the most stunting events at the age of 19-23 months, namely 50%.32.26

This is because the age of 12-24 months is a time when toddlers are undergoing a transition. At this age, many changes occur, including changes in eating patterns from breast milk to solid foods, some toddlers begin to have difficulty eating. If care is not taken care of, then toddlers more often get diseases, especially infectious diseases. The incidence of recurrent infectious diseases not only loses weight or will appear in the low value of the weight indicator for age, but also the indicator for height for age. This situation is in accordance with research by Welassih who found that the incidence of stunting was more common in children aged 12-24 months.27

Stunting

Based on the research, the results obtained from 65 children experienced stunting as many as 39 people (60%) in children aged 6-24 months in the Working Area of the Air Dingin Health Center in Padang City. In line with previous research conducted by Dalimunthe in 2015 on toddlers aged 24-59 months in West Nusa Tenggara, the results showed that the most toddlers experienced stunting, namely 56.36% and also research conducted by Sundari in 2018 on children under five at Sangkrah Health Center Surakarta City obtained results (50%) under two years are stunting.20,28

The risk for growth faltering is greater in infants who have experienced previous falters, namely conditions during pregnancy and prematurity. That is, a body length that is far below the birth average due to having experienced growth retardation while still in the womb indicates a lack of nutritional status and maternal health during pregnancy causing children to be born with less body length so that they are at risk of stunting.29

The impact of stunting is an increase in the incidence of morbidity and mortality, suboptimal cognitive, motor, and verbal development in children, increased health costs, suboptimal body posture as adults (shorter than in general), increased risk of obesity and other diseases, decreased reproductive health, learning capacity and less than optimal performance during school years, as well as suboptimal productivity and work capacity.12

Complications of stunting can hinder children's physical and mental development, risk of illness and death, stunted growth of motor and mental abilities, decreased intellectual ability, productivity, and increased risk of degenerative diseases in the future.30

B. LBW

Based on the research, the results obtained from 65 children experienced LBW as many as 27 people (41.5%) in children aged 6-24 months in the Working Area of the Air Dingin Health Center in Padang City. The results of this study are in line with previous research conducted by Hidayat in 2019 on toddlers in the Upt Work Area of the Kramatwatu Public Health Center, Serang Regency. the result of baduta experiencing LBW as much as (40%).31,20

Low birth weight, i.e. birth weight less than 2500 grams, will carry a risk of death, impaired growth and development of children, including the risk of becoming short if not handled properly.12 This condition can occur because in babies born with low birth weight, since in the womb has experienced growth retardation due to poor maternal nutrition, low maternal body mass index, low maternal height, and weight gain during pregnancy is not optimal and will continue until the next age after birth, namely experiencing slower growth and development than babies born normally and often fails to keep up with the

growth rate that should be attained at postnatal age.32

Low birth weight is a picture of multiple public health problems including long-term malnutrition, poor health, hard work and poor health care and pregnancy.33 Malnourished mothers will experience a decrease in blood volume, which will cause inadequate cardiac output so that Blood flow to the placenta decreases and the placenta becomes small and nutrients from the mother to the fetus through the placenta are reduced resulting in growth retardation. Growth retardation since in the womb is at risk of giving birth to a child with an abnormal birth weight

C. ConnectionLBW with Stunting

Based on table 5.3 shows that of the 27 children who experienced LBW, the most experienced stunting, namely 21 people (77.8%) while out of 38 children who did not experience LBW, there were 18 people (47.4%).The results of the statistical test (chi-square) obtained a value of p = 0.027 (p <0.05), it can be concluded that there is a relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the Air Dingin Health Center in Padang City. This happens because, since in the womb, the child has experienced growth retardation in the womb and will continue in the future.

The results of this study are in line with previous research conducted in Nepal conducted by Paudel in 2012 which showed that there was a relationship between a history of low birth weight and the incidence of stunting. Low birth weight had a stunting risk of 4.47 times greater than under five with low birth weight. normal and also research by Sundari in 2018 on children under two at Sangkrah Health Center Surakarta City, the results showed that there was a relationship between low birth weight and stunting in children under two years old at Sangkrah Health Center Surakarta City. p=0.032.20.38

Nasution's 2014 research in the city of Yogyakarta stated that of 121 cases of children suffering from stunting, there were 31 (25.6%) with a history of LBW. Children born with LBW have a 5.6 times risk of becoming stunted at the age of 6-24 months than babies born with normal birth weight.19 In addition to the research in Jenoponto, LBW is the most dominant risk factor associated with stunting. Children under two years old (baduta) who are born with low birth weight are 4 times more at risk of stunting compared to children who are born with normal weight.35 In contrast to the results of Rahmadi's study in Lampung, which stated that there was no relationship between low birth weight and stunting. with p = 0.966,

Babies with LBW also experience digestive tract disorders because the digestive tract is not functioning properly, cannot absorb fat and digest protein which can result in a lack of nutrient reserves in the body. This causes the growth of LBW babies to be disrupted, then if this continues with inadequate feeding, the babies often experience infections, as well as poor health care, which can cause children to experience stunting.19

A child born with LBW will grow up to be stunted, the impact of which is in the form of health problems and less productivity. At school age, if there is no improvement in adequate nutrition and good health services, it will continue at the next age, namely short adolescents. A study in China found that adolescents born with a low birth weight <2500 grams will experience delays in physical growth, cognitive capacity and academic ability compared to adolescents born with a weight >2500 grams.37

Conclusion:

Based on the results, it can be concluded that there is a relationship between low birth weight and the incidence of stunting in children aged 6-24 months in the Air Dingin Health Center, Padang City.

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