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The relationship between history of birth weight and stunting event in children of 24 - 60 months

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Abstract---Stunting is a condition of a person's height that is shorter than the height in general (of the same age). Stunting in toddlers needs special attention because it affects the disruption of physical growth, in the form of mental development disorders and intelligence. In adulthood, physical size is not optimal and the quality of work is not competitive and results in low economic productivity. The purpose of this study was to analyze the relationship between the history of weight and the incidence of stunting in children aged 24 - 60 months in Punjul in the work area of the Community Health Center Pranggang Kediri. Analytical survey research design with case-control survey design. The sampling technique used Disproportionate Cluster Random Sampling with a sample of 132 toddlers not stunting and 61 stunting toddlers. The study was conducted in April - May 2019 in Punjul, Pranggang in the work area of the Community Health Center Pranggang Kediri. The analysis in this study used a chi-square test with a significant level of 0.05. The research results obtained ρ (0.014) <0.05, which means that there is a relationship between history of birth weight with the incidence of stunting in children aged 24 - 60 months in Punjul in the work area of the Community Health Center Pranggang Kediri, and the results of the contingency coefficient test is 0.1683 which means there is a very weak relationship between a history of weight born with the incidence of stunting in infants aged 24 - 60 months in Punjul in the work area of the Community Health Center Pranggang Kediri. For the next researcher, it is expected to be able to examine more deeply the factors associated with the incidence of stunting.

Keywords---stunting, toddler, birth weight.

Introduction

Stunting is a condition where a person's height is shorter than the height of other people in general (of the same age). The cause of stunting is the lack of nutritional intake in the fetus or baby. Malnutrition occurs since in the womb and in the early days of birth, but stunting can be seen from the age of 2 years (Kementerian Desa, 2017). Short toddlers (stunting) can be seen when the toddler's height has been measured, then compared with the standard, and the results are below normal. Short (stunted) and very short (severely stunted) toddlers are toddlers with body length (PB/U) or height (TB/U) according to age compared to the 2006 WHO-MGRS (Multicentre Growth Reference Study) standard (Kemiskinan, 2017).

Globally, the highest stunting prevalence is in Africa at 40%, while the highest number of stunting cases is in Asia at 112 million. Indonesia is ranked fifth in the world with the most stunting cases, more than a third of children under five years of age are below the average height (Probosiwi, Huriyati, & Ismail, 2017). According to Riskesdas from 2007 to 2013 the stunting rate in Indonesia increased from 36.8% to 37.2% (Kemenkes RI, 2015). According to Riskesdas 2013, the highest prevalence of stunting in East Java was 56.38% in Bondowoso Regency. According to WHO, if the stunting problem is above 20%, it is a public health problem (Persakmi, 2018). From the results of a preliminary study at the Kediri District Health Office in October 2018 it was found that in August 2018 the highest prevalence of stunting was at the Pranggang Community Health Center at 28.96%. Meanwhile, according to WHO, if the stunting problem is above 20%, it is a public health problem (Persakmi, 2018). Therefore, researchers conducted a preliminary study at the Pranggang Community Health Center in November 2018, the highest stunting rate data at the Pranggang Community Health Center was in Punjul Village of 204 toddlers.

According to (Black et al., 2008) in (Puspita, 2015) Stunting also has an impact on impaired physical growth, impaired mental development and intelligence, in adulthood it can be seen from the physical size that is not optimal and the quality of work is not competitive and results in low economic productivity. In a study (Setiawan, 2018) entitled Factors Affecting Stunting in Children aged 24-59 Months in the Andalas Community Health Center Work Area, Padang Timur District, Padang City in 2018, it was concluded that there was a significant relationship between energy intake levels , history of infectious disease duration, birth weight, maternal education level and family income level with stunting incidence.

Infant birth weight was divided into three groups, namely: normal birth weight with a body weight of around 2500-3500 grams, low birth weight (LBW) which was <2500 grams and excess birth weight (macrosomia) i.e. body weight >3500 grams. Sembiring, 2017). According to (Anugraheni, 2012) that babies born normally are also at risk of stunting if their nutritional intake is lacking. Good quality and quantity of MP-ASI is an important component for toddlers because it contains a source of macro and micro substances that play a role in linear growth. Meanwhile, research conducted by Swathma et al (2016) at the Kandai Community Health Center, Kendari City, found that babies with low birth weight had a 5.250 times greater risk of experiencing stunting compared to respondents

who had normal birth weight. From the description above, the authors are interested in conducting research with the title "Relationship of Birth Weight History with Stunting Incidence in Toddlers Age 24-60 Months in Punjul Village, Pranggang Community Health Center Work Area, Kediri Regency".

Method

Design The study used an analytical survey research with a case-control survey design with a total sample of 61 samples of stunted toddlers and 132 non-stunted toddlers. The sampling technique used is Disproportionate Cluster Random Sampling. Researchers used data collection tools with data recapitulation sheets made by researchers. By looking at stunting data on nutrition reporting in February 2019 and birth weight history data, it can be seen from the Maternal and Child Health book. The analysis in this study was conducted to determine the relationship between birth weight history and the incidence of stunting in toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center, Kediri Regency, using a statistical test of contingency coefficients. The researcher has passed ethics and received an ethics certificate from the Health Research Ethics Commission of the Health Engineering Polytechnic of the Ministry of Health of Malang on March 13, 2019 Reg.No.:165/KEPK-POLKESMA/2019.

Results

Table 1. Frequency Distribution Based on
History of Birth Weight in Punjul Village, Pranggang Community Health Center Working Area

History of Birth Weight	Frequency	Percentage (%)
Not enough	21	10,9%
Normal	172	89,1%
More	0	0%
Total	193	100%

Based on table 1, from 193 respondents almost all had a history of normal birth weight as much as 89.1%.

Table 2
Distribution of the Frequency of Stunting in Toddlers in Punjul Village, Pranggang Community Health Center Working Area

Stunting Incident	Frequency				Total	(%)
Stunting	Short	(%)	Very short	(%)		
	12	19,6	49	80,4	61	31,6
No Stunting	132				132	68,4
Total					193	100

From table 3, there are 193 stunting toddlers, most of whom have a history of low birth weight of 61.9% and children who are not stunted mostly have a history of normal birth weight of 72.1%. From the results of the Chi Square test (χ^2) with an error rate of 5% using computerization, the results obtained value = 0.002. Because < 0.05, it means that H0 is rejected and H1 is accepted, there is a relationship between birth weight history and the incidence of stunting in toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center Work Area, Kediri Regency. Based on table 2, from 193 respondents, most of the children under five did not experience stunting as much as 68.4%.

Table 3
Cross Table of Birth Weight History with Stunting Incidence in Toddlers Age 24-60 Months in Punjul Village, Pranggang Community Health Center, Kediri Regency

History of Birth Weight	Stunting Incident				Total	%	ρ-value
	Stunting	%	No Stunting	%			
Not enough	13	61,9	8	38,1	21	100	0,014
Normal	48	27,9	124	72,1	172	100	
More	0	0	0	0	0	0	
Total	61	31,6	132	68,4	193	100	

Discussion

History of Birth Weight in Toddlers aged 24-60 months in Punjul Village, Work Area of Pranggang Community Health Center, Kediri Regency

Based on the results of the study which can be seen in table 1 regarding the frequency distribution of birth weight history in Toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center, Kediri Regency, it can be seen that almost all of them experienced normal birth weight as many as 172 respondents (89.1%). Birth weight is the weight of the baby who is weighed after the first hour after the baby is born. Birth weight is divided into three, namely less birth weight, normal birth weight and more birth weight. Birth weight can be influenced by the nutritional status of the mother during pregnancy. If the mother's nutrition during pregnancy is met, the baby will be born with a normal weight of 2500-4000 grams. While maternal nutrition during pregnancy is lacking, the babies born will also experience less birth weight, which is <2500 grams. The nutritional status of the mother can be seen through the upper arm circumference (LILA) of the mother during pregnancy. If the mother's LILA is <23.5 cm, it can be said that the mother has chronic malnutrition (Adriani & Wirjatmadi, 2012).

The above statement is supported by (Soetjiningsih & Gde Ranuh, 2013) that birth weight is influenced by the nutritional status of the mother during pregnancy, complications in pregnancy and stressful conditions during pregnancy. Based on the results of the study, from 193 respondents, most (136

respondents) mothers had a history of good nutritional status during pregnancy. Mothers who have a history of good nutritional status during pregnancy can give birth to babies with normal birth weights. It can also be seen in table 1 regarding the frequency distribution of birth weight history in toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center Work Area, Kediri Regency. Based on the data contained in Appendix 20, of the 21 respondents who experienced a history of low birth weight, almost all (20 respondents) were obtained from mothers with a history of poor nutritional status during pregnancy.

From the results of the study, researchers found that birth weight was less influenced by the nutritional status of the mother during pregnancy. If the nutritional status of the mother during pregnancy is not fulfilled, then the nutrition obtained by the fetus during pregnancy is also not fulfilled according to its needs so that it can result in low birth weight. This is supported by research (Hasriyani, et all, 2018) on Various Risk Factors for the Occurrence of Low Birth Weight Babies (LBW) in Makassar City. Meanwhile, according to (Pantiawati, 2010) low birth weight can be caused by maternal factors and fetal factors. Maternal factors that can affect low birth weight are maternal nutrition during pregnancy, maternal age during pregnancy <20 years or >35 years and trauma during pregnancy. While the factors of the fetus include multiple pregnancies, hydramnios, KPD.

Incidence of Stunting in Toddlers Age 24-60 Months in Punjul Village, Work Area of Pranggang Community Health Center, Kediri Regency

Based on table 2 regarding the frequency distribution of stunting in Punjul Village, Pranggang Community Health Center Work Area, most of the children under five did not experience stunting with a total of 132 respondents (68.4%). Stunting is a condition where a person's height is shorter than the height of other people in general (of the same age) (Kementerian Desa, 2017). Stunting can be caused by several factors, including women of childbearing age with LILA <23.5 cm, anemia in pregnancy, IUGR, low birth weight, exclusive breastfeeding, lack of knowledge of mothers about health and nutrition before and during pregnancy, limited health services, lack of access to nutritious food, lack of access to clean water and sanitation. Meanwhile, according to research (Bentian, Mayulu, & Rattu, 2015) about the risk factors that cause stunting, namely low birth weight and exclusive breastfeeding.

The researcher argues that the number of children under five who are not stunted in Punjul Village can be influenced by the good nutritional status of toddlers. Toddlers who have good nutritional status will not inhibit their growth and development so that stunting does not occur. With a clean lifestyle, complete immunization and exclusive breastfeeding for 6 months can prevent stunting. This is in accordance with the intervention carried out by the government in specific nutrition interventions aimed at children in the First 1000 Days of Life (HPK) to reduce the stunting rate to 30%.

Based on table 2 regarding the frequency distribution of stunting among toddlers aged 24-60 months in Pranggang Village, almost half of them experienced stunting, amounting to 61 toddlers (31.6%). Based on the results of the study, of

the 61 stunting toddlers, most (32 respondents) were caused by not achieving exclusive breastfeeding. Infants who are not exclusively breastfed are given formula milk. While the content in formula milk is not the same as the content in breast milk, so babies do not get enough nutrition. The above statement is supported by research (Bentian et al., 2015) that the risk factors that cause stunting are low birth weight and exclusive breastfeeding. Stunting is something that parents consider as something normal. Parents assume that their child can still experience growth because he is still a toddler, whereas if stunting is not detected early, then the improvement in nutrition will be delayed for the following year. Therefore, it is important to provide counseling to parents about the incidence of stunting so that parents can anticipate stunting events by providing adequate nutrition for their children and being able to monitor the process of growth and development experienced by their children.

Efforts have been made to prevent stunting in Punjul Village, namely providing counseling to pregnant women about the nutrition needed by pregnant women, providing counseling about stunting so that mothers know about stunting and can be more protective of their pregnancies, providing counseling about exclusive breastfeeding so that their babies not malnourished and not susceptible to infectious diseases. And not only pregnant women who are given counseling but also mothers of toddlers are given counseling about the importance of complete immunization and the importance of integrated service posts because they can monitor weight gain. Now toddlers at the posyandu are also given deworming medicine every 6 months. As well as the nutrition section also held a cooking class which was attended by mothers of toddlers. Previously, this cooking class was only used for BGM toddler intervention, but now the cooking class is also used for stunting toddlers.

Relationship between Birth Weight History and Stunting Incidence in Toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center Working Area

From the results of the Chi Square correlation test with an error rate of 5%, the results obtained value = 0.002. Because < 0.05, it means that H0 is rejected and H1 is accepted, it means that there is a relationship between birth weight history and the incidence of stunting in toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center Work Area, Kediri Regency. After that, the contingency coefficient was tested to see how closely the history of birth weight was with the incidence of stunting in toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center Work Area, Kediri Regency, the result was 0.222. These results show that the relationship between birth weight history and the incidence of stunting in toddlers aged 24-60 months in Punjul Village, Pranggang Community Health Center, Kediri Regency is low. This is because there are 13 respondents (61.9%) with low birth weight who experience stunting, only 5 respondents more than those with low birth weight who do not experience stunting, which is 8 respondents (38.1%).

Babies with low birth weight have an impact on developmental and growth disorders and can lead to stunting if the nutrition they get is not enough. Babies with low birth weight are also susceptible to infection. This is also a factor in the

occurrence of stunting. This statement is supported by research (Aridiyah, Rohmawati, & Ririanty, 2015) on Factors Affecting Stunting Incidence in Toddlers in Rural and Urban Areas. mother's education, family income, mother's knowledge about nutrition, exclusive breastfeeding, age of complementary feeding, zinc and iron adequacy level, history of infectious disease and genetic factors. Babies with low birth weight will be susceptible to infection because humoral and cellular immunity is still lacking so that babies are susceptible to infection. In addition, it is caused by the skin and mucous membranes that do not have protection like normal babies (Pantiawati, 2010). Babies with low birth weight also experience developmental and growth disorders. This growth and development disorder is influenced by nutritional factors that are starting to be experienced by pregnant women. Pregnant women with poor nutritional status are at risk of giving birth to LBW babies. LBW babies will grow and develop more slowly, especially if they don't get enough nutrition. Therefore, LBW babies tend to grow into toddlers with low nutritional status. If this teenager grows up, the teenager will become a stunted adult (Marmi & Rahardjo, 2015).

However, the data obtained from the results of the study showed that there were quite a lot of toddlers with a history of low birth weight who did not experience stunting compared to toddlers who had a history of low birth weight who experienced stunting. Under-fives with a history of low birth weight should be stunted, but quite a lot of toddlers with low birth weight are not stunted. This is influenced by the fulfillment of adequate nutrition so that toddlers with a history of low birth weight can catch up with delays in development and growth. The relationship between birth weight and the incidence of stunting in low Punjul Village can also be influenced by other factors experiencing stunting, namely not achieving exclusive breastfeeding. Based on the data obtained, the majority of toddlers who experience stunting are caused by not achieving exclusive breastfeeding. By not achieving exclusive breastfeeding, babies do not get enough nutrition, which affects their growth and development and can cause stunting. This agrees with the research (Bentian et al., 2015) Risk Factors for Stunting in Kindergarten Children in the Work Area of the Siloam Tamako Community Health Center, Sangihe Islands Regency, North Sulawesi Province. It was found that low birth weight and exclusive breastfeeding can cause stunting. (Kementerian Desa, 2017) also explained that stunting is also influenced by several factors, one of which is exclusive breastfeeding.

Based on table 3 regarding the cross table of birth weight history with the incidence of stunting in toddlers in Punjul Village, Pranggang Community Health Center, Kediri Regency, it was found that 48 respondents (27.9%). Babies with normal birth weight are also at risk of stunting if their nutritional intake is lacking. Babies get their nutrition from breast milk. Breast milk contains all the nutrients for building and providing energy in the necessary order. Breast milk does not burden the function of the digestive tract and kidneys and produces optimum physical growth (Adriani & Wirjatmadi, 2012). However, babies who are not exclusively breastfed are given formula milk. While the content in formula milk does not contain anti-infective substances as contained in breast milk.

Babies who do not get adequate nutritional intake and only drink formula milk, babies can be susceptible to infectious diseases. Infectious diseases cause

damage to several organ functions. Organs in children affected by infectious diseases cannot work optimally, so that some functions of damaged organs cannot absorb food substances properly (Septikasari, 2018). Babies who suffer from infectious diseases can cause growth and development disorders (Istiany & Rusilanti, 2014). The above statement is supported by research (Dewi & Widari, 2018) that infectious diseases are 3,071 times greater at risk of stunting.

This statement is supported by research data, that of 48 toddlers who have a history of normal birth weight can experience stunting because half (24 respondents) of them do not get exclusive breastfeeding for 6 months. Babies who don't get exclusive breastfeeding will be susceptible to infection because they don't get anti-infective substances contained in exclusive breastfeeding and the nutritional intake they get is not in accordance with their needs. Infants who are infected with infections can cause disturbances in growth and development because infectious diseases can cause damage to several organ functions. And these organs cannot work optimally, so that some functions of the body's organs cannot absorb nutrients properly.

Based on table 3 about the cross table of birth weight history with stunting in Punjul Village, Pranggang Community Health Center Work Area, it was found that 13 respondents (61.9%). Low birth weight can be caused by malnutrition during pregnancy so that the fetus during pregnancy does not get adequate nutrition. This can inhibit the process of growth and development in body cells so that babies are born with less birth weight (Septikasari, 2018). From the results of research (Fitri, 2018) regarding the relationship between LBW and exclusive breastfeeding with the incidence of stunting at the Lima Puluh Pekanbaru Public Health Center, it was shown that of the 22 LBW children under five, 16 people (72.7%) were stunted. The chi-square results obtained p-value 0.000 <0.05, it can be concluded that there is a significant relationship between low birth weight and the incidence of stunting in children under five at the Lima Puluh Pekanbaru Community Health Center. LBW can experience developmental and growth disorders. This growth and development disorder is influenced by nutritional factors that begin to be experienced by the mother during pregnancy. LBW babies if they do not get adequate nutrition can affect their growth and development as adults and can lead to stunting.

Conclusion

- Almost half of toddlers aged 24-60 month in Punjul Village, Work Area of the Pranggang Community Health Center, Kediri Regency in 2019 experienced stunting.
- A small proportion of toddlers who experience stunting have a history of low birth weight.
- There is a low correlation between history of birth weight and the incidence of stunting in toddlers aged 24-60 months in Punjul Village, Work Area of the Pranggang Community Health Center, Kediri Regency in 2019.

Suggestion

- For Further Researchers

The incidence of stunting is influenced by multiple factors, both directly and indirectly, so it is hoped that further researchers can conduct research by including various variables not included in the study, such as genetic factors, body length at birth, parenting in toddlers, nutritional intake of toddlers, environmental sanitation so that it can be used as a reference and information to add insight.

- For Respondents
  It is hoped that mothers can pay attention to the growth and development of their children, especially in eating patterns, parenting patterns, the nutritional intake needed is fulfilled or not so as to reduce the risk of stunting in toddlers. It is also hoped that families will participate in interventions carried out by the Pranggang Community Health Center to reduce stunting rates, namely attending counseling for pregnant women and mothers of toddlers, attending cooking classes to find out the nutrition needed by toddlers and mothers to give deworming medicine every 6 months to children. his son.
- For Health Workers
  Health workers, especially those who play a role in child development and nutrition problems, should increase the provision of information and education on stunting so that mothers know and can prevent stunting in toddlers.

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