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Teenage Pregnancy as a Risk Factor of Stunting and Wasting among Children Aged 6-23 Months in Indonesia (IFLS 5 Analysis Study)

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Abstract

Stunting and wasting are interrelated with an increase in mortality, especially when both are experienced by the same child and an increase in perinatal mortality and morbidity in Indonesia due to pregnancy and birth in adolescence. The purpose of this study was to analyze the magnitude of the risk of teenage pregnancy against stunting and wasting in children aged 6-24 months in Indonesia. This study uses a nested case-control study design by analyzing data from the 5th Indonesia Family Life Survey. The results of the bivariable analysis of the incidence of stunting and wasting were not statistically related to teenage pregnancy with p= 0.39 (OR = 1.30; CI 95 = 0.67-2.48). The results of multivariate analysis of the incidence of stunting and wasting with teenage pregnancy by including variables of birth weight, maternal height, infectious diseases, and location of residence were not correlated with p = 0.47 (OR = 1.25; 95% CI = 0.67-2.35). This study found that there was no correlation between teenage pregnancy with stunting and wasting, but it still needed a strategy to reduce teenage pregnancy rates through socialization and education on the dangers of early marriage to get a generation with better health status.

Introduction

Stunting and wasting are often described as two nutritional problems that require different interventions in prevention or treatment. However, stunting and losing are closely related and often occur in the same child (Khara & Dolan, 2014). Stunting and losing are linked to increased mortality, especially when both are experienced by the same child. In overcoming the problem of stunting and wasting as a factor that often triggers mortality, it is necessary to design an efficient program to overcome it (Briend et al., 2015). The nutritional status of stunting and wasting can be measured based on the Z-score calculation, namely for the incidence of stunting using the index of body length / height according to age at the vulnerable age of 0-60 months and for the incidence of wasting using the index weight according to body length / height for age vulnerable 0-60 months (Kementerian Kesehatan RI, 2011).

Children under five years are an age group that is vulnerable to problems with nutritional status, one of which is stunting and wasting. Provision of adequate nutrition is essential to ensure good physical and mental development and for long-term health. Malnutrition accounts for 35% of all deaths among infants under five years of age. Babies under five years of> 2 million die each year due to malnutrition (Fikadu et al., 2014). If the problem of nutritional status is not detected early, the nutritional improvement process will

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be delayed in the following year (Fitri, 2018).

Based on data from Basic Health Research (2013), the national incidence of stunting in 2010 in children under five was 35.8% and in 2013 it increased to 37.2%. The number of stunting sufferers is 37.2% of the 24 million children under five, meaning Indonesia has more than 8.9 million children with stunting (Kementerian Kesehatan RI, 2017). This condition makes Indonesia the fifth country with the highest number of stunted children in the world (UNICEF, 2013). For the national incidence rate of wasting in children under five was 13.6% in 2007 and decreased to 12.1% in 2013, however WHO states that the prevalence of wasting is a serious public health problem if it is in the range 10.0-14.0 %, and is considered critical if the incidence is ≥15.0% so that the incidence of wasting is declared as a serious public health problem in Indonesia (BAPPENAS, 2013).

The nutritional status of children at birth is one of the causes of nutritional problems. Chances of survival are lower and anthropometric failure (stunting, wasting, and underweight) is higher in children born to mothers with poor reproductive health (Prakash et al., 2011). Teenage pregnancy results in various health losses for women, namely morbidity and mortality, mental and psychological well-being, economic and career opportunities, poverty and future life prospects (Paul, 2018; Utomo & Utomo, 2013).

The increase in mortality and morbidity in perinatals in Indonesia is one of the contributions to the incidence of pregnancy and birth experienced by adolescent mothers. (Kementerian Kesehatan RI, 2016). Indonesia still makes marriage and childbirth in adolescence a formidable challenge. The high rate of marriage in adolescents is shown by data from the 2012 Indonesian Demographic and Health Survey, namely Indonesia has a teenage birth rate of 48 individuals per 1000 young women aged 15-19 years (BKKBN et al., 2013).

If the right policies and interventions are not given to the high incidence of stuting and wasting and high pregnancy rates in adolescence, then this incident will contribute to an increase in mortality and morbidity in children and mothers and have an impact on reducing the human development index ultimately has an impact on future regional development.

Researchers think there is a need for research on teenage pregnancy and the incidence of stunting and wasting using IFLS 5 data, because the results of this study allow to see the changes in the next IFLS survey with the same subjects considering that this survey is ongoing.

Method

This study used a nested case-control study design by analyzing the 5th period of the Indonesia Family Life Survey (IFLS) data. IFLS is a longitudinal survey whose sample represents 83% of Indonesia's population. This survey was conducted in 13 Provinces in September 2014 – March 2015. IFLS 5 data can be accessed in March 2016.

The study population was all children aged 6–23 months in Indonesia (n = 1653). Samples were selected based on inclusion criteria, namely 1) families with children aged 6-23 months; 2) families who have children and / or registered caregivers and were interviewed as respondents in the 2014 IFLS data. Children with incomplete data and / or children who were only wasting or stunting were excluded. The case group (children aged 6-23 months who experienced wasting and stunting) and the control group (children aged 6-23 months with good / normal nutritional status) were selected using simple random sampling method. Cases and controls involved 167 people. This study used a comparison of cases and controls, namely 1: 2 in order to obtain a case group of 167 children and a control group of 334 children.

Data were analyzed using the chi-square statistical test and using a significance value of $\alpha < 0.05$ and the magnitude of the relationship or risk between the independent and dependent variables using the OR (Odds Ratio) value. The test used to see the factors that most influence the dependent variable is the logistic regression test.

Results and Discussion

The general description of the characteristics of research subjects can be seen in Table 1 below. It shows that mothers with adolescence were more often found in

the case group (11.38%) than the case group (8.98%). Children with a history of low birth weight (10.78%) were also more in the case group than the control group (5.09%). Non-exclusive breastfeeding was more in the control group (65.87%) than the case group (62.87%). Mothers with low education were more often found in the case group (44.91%) than in the control group (42.51%). More short mothers in the case group (49.10%) than the control group (34.73%). Low economic status was also more in the case group (55.69%) than the control group (52.99%). More infectious disease history was found in case respondents (26.95%) than in the control group (21.56%). There were more urban density in the control group (62.57%) than the case group (54.49%).

The relationship between stunting and wasting variables with adolescent pregnancy variables and external variables is illustrated in Table 2, where children with the incidence of stunting and wasting are not significantly associated with adolescent pregnancy. It can be concluded that children who experience stunting and wasting have a 1.3 times greater risk of coming from mothers with teenage pregnancies than children with normal nutritional status. The incidence of stunting and wasting was significantly associated with birth weight of children. Children who experienced the incidence of stunting and wasting had a 1.3 times greater risk of having a history of low birth weight than children with normal nutritional status.

Stunting and wasting were not significantly associated with exclusive

Table **1**. Distribution of the characteristics of research subjects to cases and controls

Variable	Stunting and Wasting			
	Cases		**Control**	
	N	%	N	%
Mother's Age				
Teenage	19	11.38	30	8.98
Adult	148	88.62	304	91.02
Birth weight				
LBW	18	10.78	17	5.09
Normal	149	89.22	317	94.91
Exclusive Breastfeeding				
Not exclusive breastfeeding	105	62.87	220	65.87
exclusive breastfeeding	62	37.13	114	34.13
Mother's education				
Low	75	44.91	142	42,51
High	92	55.09	192	57.49
Mother's height				
Short	82	49.10	116	34.73
Normal	85	50.90	218	65.27
Economic status				
Low	93	55.69	177	52.99
High	74	44.31	157	47.01
Infectious disease				
Ever	45	26.95	72	21.56
Never	122	73.05	262	78.44
Location of residence				
Urban	91	54.49	209	62.57
Rural	76	45.51	125	37.43

Source: IFLS data for 2014

breastfeeding. Children who experienced the incidence of stunting and wasting had a 0.87 times smaller risk of coming from children with a history of exclusive breastfeeding than children with normal nutritional status. Stunting and wasting nutritional status did not have a significant relationship with maternal education. Children who experience stunting and wasting have a 1.1 times greater risk from a history of low maternal education than children with normal nutritional status.

Stunting and wasting were significantly associated with maternal height. Children who experienced the incidence of stunting and wasting had a 1.81 times greater risk from mothers with short stature than children with

Table 2. Bivariate analysis between stunting and wasting variables with adolescent pregnancy variables and external variables

Variable	Stunting and Wasting				p	OR
	Cases		Control			
	n	%	n	%		
Independent Variable (Bound)						
Mother's Age						
Tenage	19	11.38	30	8.98	0.39	1.30
Adult	148	88.62	304	91.02		
External variables						
Birth weight						
LBW	18	10.78	17	5.09	0.01*	2.25
Normal	149	89.22	317	94.91		
Exclusive breastfeeding						
Not exclusivebreastfeeding	105	62.87	220	65.87		
Exclusive breastfeeding	62	37.13	114	34.13	0.50	0.88
Mother's education						
Low	75	44.91	142	42.51	0.61	1.10
High	92	55.09	192	57.49		
Mother's height						
Short	82	49.10	116	34.73	0.001**	1.81
Normal	85	50.90	218	65.27		
Economic status						
Low						
High	93	55.69	177	52.99	0.56	1.11
	74	44.31	157	47.01		
Infectious disease						
Ever	45	26.95	72	21.56	0.17	1.34
Never	122	73.05	262	78.44		
Location of residence						
Urban	91	54.49	209	62.57	0,08	0.72
Rural	76	45.51	125	37.43		

OR= Odds Ratio *= Meaningful / Significant (α<0,05)
p = p value **= Meaningful / Significant (α<0,01)

Source: IFLS data for 2014.

normal nutritional status. Stunting and losing were not significantly related to economic status. Children with stunting and losing had a 1.11 times greater risk of coming from a family history with a low income level than children with normal nutritional status. Stunting and wasting were not significantly associated with infectious diseases. Children with stunting and wasting had a 1.34 times greater risk from a history of infectious diseases than children with normal nutritional status.

Stunting and wasting did not show a significant relationship with the location of residence. Children with stunting and losing had a 0.72 times lower risk of coming from children with urban living locations than children with normal nutritional status.

Several models made to see the factors associated with the incidence of stunting and wasting in children aged 6-23 months in Indonesia are shown in Table 3 below, where Table 3 shows that model IV was chosen as the best model to explain the relationship between teenage pregnancy and the incidence of stunting and wasting by considering all variables that are significant to the incidence of stunting and wasting as seen from the largest determinant coefficient (R2) and the smallest deviation value. Model IV was built to see the relationship between the incidence of stunting and wasting in children aged 6-23 months with the age of the mother at pregnancy by including the variables of the child's birth weight, maternal height, history of infectious disease, and location of residence. The results of the analysis showed that the relationship was not statistically significant with OR 1.25. These results indicate that children with stunting and wasting have a 1.25 times greater risk from mothers with teenage pregnancies (<19 years) along with variables of birth weight, maternal height, infectious diseases and location of residence. The R2 value of 0.028 is defined as pregnancy in adolescence which contributes to the incidence of stunting and wasting by 2.8% after controlling for variables of maternal height, socioeconomic status and location of residence, while 98.2% is caused by other factors.

The incidence of stunting and wasting with adolescent pregnancy does not have a statistical relationship. This is probably because the age of adolescent mothers and adult mothers are both psychologically immature when they attend health services and fulfillment of nutrition (Anwar et al., 2006). Teenage pregnancy can significantly reduce the risk of health problems, one of which is preeclampsia (Vienne et al., 2009). Preeclampsia has an impact on the health of both mother and fetus. For the fetus, preeclampsia is a factor that causes growth restriction (Byberg et al., 2017). Several factors influence children's growth, namely socioeconomic, child care, biological factors and child feeding practices (Yu et al., 2016).

The analysis results showed a significant relationship between the incidence of stunting and wasting with birth weight. Birth weight is the most important determinant of the subsequent growth status of children (Aryastami et al., 2017; Saville et al., 2018). Infants with low birth weight have poor weight and linear growth in children compared to babies with normal birth weight (Adair, 1989; Rahman et al., 2016).

The incidence of stunting and wasting was not significantly associated with a history of exclusive breastfeeding. The same thing was found by Pravana et al. (2017) stated that exclusive breastfeeding of children before or after six months of age was not significantly associated with the incidence of malnutrition. A history of exclusive breastfeeding does not have to be a cause of malnutrition in children because community interventions for newborn care that have been implemented in the intervention area are the reason the nutritional status of children remains at normal limits (Mishra et al., 2013).

Children with the incidence of stunting and losing were not significantly related to maternal education. Low maternal education is not a benchmark in assessing maternal knowledge at this time, because knowledge can be accessed through many available media. Mothers with good education, but only have a small allocation of time to care for, care for and educate their children because having a busy job will have an impact on children's growth disorders (Nasikhah & Margawati, 2012). Better knowledge allows mothers to apply it in caring for their children, especially in providing proper food, so that children do not lack nutritional

Table 3. Logistic regression analysis between teenage pregnancy and the incidence of stunting and wasting with external variables

Variable	Model I OR (95% CI)	Model II OR (95% CI)	Model III OR (95% CI)	Model IV OR (95% CI)
Mother's age				
Teenage	1.30 (0.71-2.39)	1.17 (0.63-2.18)	1.32 (0.71-2.46)	1.25(0.67-2.35)
Adult	1	1	1	1
Birth weight				
LBW		2.08* (1.03-4.19)		1.91(0.94-3.88)
Normal		1		1
Mother's height				
Short			1.82** (1.24-2.66)	1.77*(1.20-2.59)
Normal			1	1
Infectious disease		1.34(0.87-2.07)	1.33 (0.86-2.06)	1.33(0.85-2.06)
Ever		1	1	1
Never				
Location of residence				
Urban		0.75(0.51-1.10)	0.74 (0.51-1.09)	0.75(0.51-1.10)
Rural		1	1	1
Pseudo R2	0.001	0.015	0.023	0.028
AIC	641.1	638.3	632.9	631.7

Information: CI (Confidence interval); * significant (α <0.05); ** significant (α <0.01); OR (Odds Ratio) is calculated using logistic regression test

Source: IFLS Data for 2014

intake (Ni 'mah & Nadhiroh, 2015)

The results showed a significant relationship between the incidence of stunting and wasting with maternal height. The linear acceleration of a child has a relationship with the mother's height (Hambidge et al., 2012). Mothers with short stature are a problem of chronic nutritional status that can decrease in the next generation and become a risk factor for perinatal and neonatal mortality (Ferreira et al., 2009; Lawn et al., 2005; Özaltin et al., 2010). Short mothers will have less protein and energy reserves, smaller reproductive organs, and limited space for fetal development. This is related to the placenta which can affect fetal growth. In addition, it will have an impact on infant growth because it is related to the quality and quantity of breast milk (Addo et al., 2013; Martorell & Zongrone, 2012).

The incidence of stunting and losing was not significantly related to socioeconomic status. Research (Hien & Hoa, 2009) also shows the same thing that there is no relationship between household income per capita and malnutrition. Socioeconomic status can affect a person in accessing healthy and nutritious food and health services. High socioeconomic status must be supported by good nutritional knowledge of parents because it can affect the nutritional status of children and care for children's growth (Pravana et al., 2017).

The results of statistical analysis showed no relationship between the incidence of stunting and wasting and infectious diseases. The same thing was shown by research (Assefa et al., 2013) conducted in Southwest Ethiopia that diarrhea was not significantly related to nutritional status. Likewise with research (Anisa, 2012) conducted in Kalibaru Village, infectious diseases (diarrhea and ISPA) were not related to the nutritional status of children under five.

The incidence of stunting and wasting was not significantly related to the location of

residence. The existence of research in India shows that there are significant differences in health behavior between pregnant women in rural and urban areas (Singh et al., 2012). Pregnant women in rural areas tend not to routinely check their pregnancies to health workers because access to health services is very far away and it is difficult to make pregnant women rarely have their pregnancy checked in health services.

The results of statistical analysis showed that the dominant factor associated with stunting and wasting was maternal height. From the results of this study it can be concluded that the incidence of stunting and wasting in Indonesia today is strongly influenced by genetic factors, one of which is the mother's height. This is because the mother's height is a complex interaction of several factors before pregnancy. Therefore, it is necessary to achieve optimal health and nutritional status before and during pregnancy.

Conclusion

Teenage pregnancy is not a proven risk factor for stunting and wasting in children aged 6-23 months in Indonesia. However, birth weight and maternal height are variables that have a relationship with the incidence of stunting and wasting. Therefore, it is necessary to make policies that support intensive pregnancy care for pregnant women, especially pregnant women who are at risk of having pregnancy problems. Mothers are expected to check their pregnancy or baby's health. Mothers who do not perform pregnancy checks or their babies' health at health services must have home visits so that health services can still be accessed optimally. Mothers are also expected to use pregnancy care services that have been prepared by the government and be more responsive in finding out about pregnancy care and child development care in order to avoid problems with nutritional status in children.

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