



Is there a Relationship Between Pregnant Women's Characteristics and Stunting Incidence In Indonesia?

Demasa Simbolon^{1✉}, Frensi Riastuti², Jumiyati¹, Desri Suryani¹

¹Poltekkes Kemenkes Bengkulu

²Perwakilan BKKBN Propinsi Bengkulu

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Abstract

Teenage pregnancy has an impact on the outcomes. Teenage pregnancy is at risk of adverse health, an increased risk of domestic violence, poor nutrition, and sexual and reproductive health problems, lower levels of education, and higher levels of poverty compared to women who postpone marriage age. The study aims to determine the relationship between marriage and Adolescent pregnancy with the incidence of stunting in children under five years in Indonesia. The study used a cross-sectional approach from 2014 IFLS (Indonesian Family Life Survey) data. The bivariate analysis used the Chi-Square Test when the multivariate analysis used logistic regression. The results found the prevalence of stunting in Indonesia in 2014 was 36.6%. The stunting prevalence is higher in toddlers of married mothers of adolescents (42.4%) compared to mothers of married mature (35%). The stunting prevalence was also higher in children under five years from adolescent pregnant women (44.4%) compared to mothers who were of sufficient age (35.6%). Teenage pregnancy is associated with the incidence of stunting. A married teenage woman is 1.2 times at risk, and a woman who is less than 20 years pregnant is 1.3 times at risk of having a stunting toddler. Teenage pregnancy increases the prevalence of stunting. Cross-sectoral integrated interventions are needed to prevent adolescent pregnancy. It is required to decrease the prevalence of stunting. The various risks that occur in teenage pregnancy are the basis for the importance of pregnancy prevention efforts in this age group by involving the related sectors.

Introduction

Adolescence is a transitional period marked by physical, emotional, and psychological changes. Teenagers are prone to various problems. Reproductive health problems that are often faced by adolescents are problems of sexuality, sexually transmitted infections (STIs), HIV / AIDS, abortion, a pregnancy outside of marriage, unwanted pregnancies, and early marriage. Teenage pregnancy is associated with an increase in early marriage. The incidence of early marriage in Indonesia is still high. In the 2017 Susenas report, the percentage of married women aged ten years and over in rural areas reached

37.79% in 2012 and 37.71% in 2013 (BKKBN et al., 2018). The high rate of early marriage in Indonesia causes the first pregnancy to also occur at an early age or when the mother is still a teenager and is often called teenage pregnancy

Teenage pregnancy causes very complex problems regarding physical, psychological, economic, and social. Physical problems that are often experienced by pregnant adolescents are anemia, impaired fetal growth in the womb, risk of premature labor, risk of abortion, and the occurrence of preeclampsia. Psychological problems due to young age result in emotional instability that will affect fetal growth and development. Children born to adolescent

✉ Correspondence Address:
Poltekkes Kemenkes Bengkulu
Email: demsa_ui03@yahoo.com

mothers often experience developmental and behavioral disorders. Health problems in pregnant adolescents are at risk of causing maternal and fetal death (Mersal and Khalil, 2013)

Teenage pregnancy will have an impact on pregnancy outcomes. Teenage pregnancy adversely affects the nutritional status of the fetus and infant. Raj et al (2010) explained that children under five who were born to women who were married in adolescence were significantly more at risk of having stunted children. Mothers giving birth to babies under 20 years of age are a risk factor for low birth weight (LBW). Prakash et al (2011) found that children born to mothers with poor reproductive health have a lower chance of survival and a higher chance of experiencing growth failure, one of which is stunting. Teenage girls who pregnant use to have a low Body Mass Index (BMI)/underweight. Underweight is associated with a lack of nutritional intake resulting in low weight during pregnancy. Incorrect weight gain results in a high incidence of premature births is a factor in the occurrence of stunting in children under-five (Vivatkusol, 2017).

Many factors cause the problem of stunting in toddlers, one of which is maternal factors. Age during pregnancy is a maternal factor that can be a direct and indirect problem with fetal and toddler growth disorders. Maternal factors include poor nutrition during pre-conception, early pregnancy, maternal mental health, premature birth, IUGR (Intra Uterine Growth Restriction), short birth spacing, and hypertension (WHO, 2012). Various research results explain the relationship between adolescent pregnancy and the incidence of stunting, but the results of research in Indonesia use very limited national data to explain this relationship, so it is necessary to research with the aim of knowing the relation between teenage pregnancy and the incidence of stunting in Indonesian toddlers by controlling the other.

Method

The study used a cross-sectional approach using secondary data from IFLS (Indonesian Family Life Survey) in 2014 or known as SAKERTI (Survey of Indonesian

Household Life Aspects). The population is all children under five born alive in Indonesia in 2010-2014. Samples are toddlers who meet the inclusion criteria, namely biological children, live births, in the implementation of IFLS 2014 children aged 1- 5 years, children live with their biological parents (father and mother), available data on length or height, available data required (factor children, maternal factors and family factors), the child does not experience accompanying harm. The sample size that met the inclusion criteria was 4,809 children under five. The research variables were identified from a structured questionnaire. Maternal age at pregnancy is the mother's age in years at the time of pregnancy of the child being analyzed, which is calculated by finding the difference between the year of birth of the child and the year of birth of the mother, with a classification of fewer than 20 years (teenage pregnancy) and 20 years or more (full-age pregnancy.). The incidence of stunting was measured by the Z score of PB / U index in children under 2 years and TB / U in children 2 years and over. The results of the Z score calculation of PB / U or TB / U were grouped into normal (Z score \geq -2) and short (Z score $<$ -2). Confounding variables are family factors (number of children under five, place of residence, socioeconomic status, access to health facilities, environmental health), child factors (birth weight of children, gestational age, multiple births, infectious diseases, immunization status, exclusive breastfeeding) and maternal factors (mother's education, marital status, parity, physical activity, mother's height, father's height, quality of ANC and quantity of ANC). Data processing begins with examining the variables to be analyzed, then explores the data by looking at the distribution of data to determine the types of data distribution available. In addition, data cleaning was also carried out that were not in accordance with the interests of the analysis as well as missing data, so that it was not included in the next analysis. Furthermore, the data merger was carried out by combining data that had been checked and cleaned of data using binding IDs (household ID and individual ID).). The next step is to transform the data by making a compute or recode for certain variables. Data analysis uses univariate

analysis to see the frequency distribution of each variable, bivariate analysis using the Chi-Square test for proportional bed test, and simple logistic regression test for multivariate

candidate variable selection. Multivariate analysis used multivariate logistic regression controlling for confounding variables.

Result and Discussion

Table 1. Description of Age of First Marriage and Age of Pregnant Women with Incidence of Stunting in Toddlers in Indonesia

Mother's Age When Pregnant	Toddler's Height		p
	Normal (n=3047)	Stunting (n=1762)	
o Mature (n=4242)	64,4	35,6	0,001
o Teenage Pregnancy (n=567)	55,6	44,4	
Total	63,4	36,6	

Source: Primary Data, 2019

Table 1 shows the differences in the prevalence of stunting according to the age of the mother during pregnancy. Based on the age of the mother during pregnancy, it shows that stunting prevalence is higher in children under five from mothers who are pregnant in adolescence age (44.4%) compared to mothers who married on aged over 20 years (35.6%). Teenage pregnancy is a public health problem. The results of the study found 35.6% of the incidence of stunting in full-age pregnant women and 44.4% of the incidence of stunting in pregnant women of child age. In various regions and regions, a large number of teenagers are already sexually active. About half of them are married and gave birth in their teens. Every year in the world, approximately 16 million adolescents aged 15-19 years give birth, or about 11% worldwide. 95% of these births occur in low- and middle-income countries, where birth rates average two times higher than in high-income countries (WHO, 2013). In Indonesia, it is recorded that more than 50% of first pregnancies occur during adolescence (Kemenkes RI, 2018).

Teenage pregnancies are often characterized by delayed initiation of prenatal care, poor prenatal health behaviors, and low birth weight babies. Recent research has also shown that healthy babies born to teenage mothers are at increased risk of postneonatal death (Rosengard, 2006). Teenage pregnancy and early marriage pose a risk to public and social health, as well as individual tragedy.

Associated with mental health, parenting, and education issues, as well as obstetric risks. Maternal physiological insecurity represents a 2-3 times higher risk for low birth weight and fetal growth restriction, prematurity, and poor newborn health. Teenage pregnancies can also endanger maternal health, with pregnancies under 25 years of age found significantly higher anemia and medical risks (bleeding, blood transfusions) in mothers under 16 years. It is confirmed that depression is particularly high in pregnancy and postpartum, accounting for 40-50% of moderate to severe symptoms. Likewise, teenage pregnancy is associated with higher rates of depressive symptoms. Depression has been shown to persist from the early years of adolescent pregnancy care, and follow-up over 17 years found a substantial increase in major depression among women with teenage pregnancies. Regarding early marriage, it is agreed that a very early age of marriage, often immediately after menstruation, also causes the highest mental health problems. There is evidence of suicide and self-injury among child brides around the world. Domestic and partner violence have been found to increase mental health problems in women such as depression or even suicide, and worsen somatic health, as well as establish physiological risk factors, such as high cardiovascular disease and stress reactivity. Regarding productive health, women exposed to violence were 16% more likely to have babies with low birth weight, and twice as likely to have an abortion,

compared to women who did not experience partner violence. However, an a prospective population-based study in South Africa found a two-way relationship, that is, not only was partner violence associated with an increased risk of future depression, but also depression was associated with an increased risk of future violence in transition to motherhood. Several studies have shed light on how partner violence will impact mental health risks found among women with a history of teenage pregnancy (Sezgin and Punamaki, 2019).

Unwanted pregnancies at conception as well as pregnancies that are not on time. Similar to the intended pregnancy, an unwanted pregnancy can lead to an unplanned birth (48%), termination of pregnancy (43%), or miscarriage (9%). In 2006, 49% of all pregnancies among women aged 15 to 44 were accidental, increasing from 50 to 52 per 1000 women aged 15 to 44 years in 2001.1,2 From a public health perspective, the benefits to maternal and child health were not can be avoided (Haider, 2013).

The results of the study found that the prevalence of stunting is a serious problem, so it must remain a priority program. The impact of stunting will increase the risk of morbidity and mortality, delayed motor development, and stunted mental growth (Purwandini, 2013).

Stunting toddlers are more susceptible to infections, especially diarrheal and respiratory diseases, and malaria. Infection increases malnutrition, thus creating a vicious cycle of developmental disabilities (Vonaesch, 2017), low productivity (Anugraheni, 2014) and an increased risk of degenerative disease in the future (Picauly and Toy, 2013; Crookston et al., 2010) because stunting is at risk of obesity. Gaining just a few pounds can cause a person's Body Mass Index (BMI) to rise above normal (Timæus, 2012). Conditions of overweight and obesity that continue for a long time will increase the risk of degenerative (Anugraheni, 2014).

Table 3 shows that there is no difference in gestational age at delivery, the incidence of twins, a history of infectious diseases, exclusive breastfeeding, immunization between women who are pregnant at adolescence and mature.

Table 4 shows that there is no difference in the prevalence of stunting according to marital status, maternal height, and ANC quality. There is a difference in the stunting prevalence according to the mother's education. The lower the mother's education, the higher the prevalence of stunting. Based on the parity, the stunting prevalence is higher in grand multipara (more than three children) and primipara (one child). Compared to multipara

Table 2. Family Characteristics of Teenage Pregnant Woman

Family Characteristics	Woman Age in Pregnancy		p
	Mature	Teenage	
Number of Toddlers			
o one (n=3940)	88,7	91,0	0,0001*
o more than one (n=869)	11,3	9,0	
Residential Area			
o Urban (n=2764)	59,5	42,3	0,0001*
o Rural (n=2045)	40,5	57,7	
Socioeconomic Status			
o High (n=2429)	52,9	46,4	0,0001*
o Low (n=2380)	47,1	53,6	
Access to Health Facility			
o Easy (n=4608)	96,1	94,0	0,021*
o Difficult (n=201)	3,9	6,0	
Environmental Health			
o Good (n=495)	10,7	6,9	0,004*
o Poor (n=4314)	89,3	93,1	

*multivariate candidate variable

Source: Primary Data, 2019

Table 3. Toddler Characteristics on Teenage Pregnant Woman

Toddler Characteristics	Woman Age in Pregnancy		P
	Mature	Teenage	
Born Weight			
o >3,5 kg (n=1277)	70,7	29,3	0,0001*
o 3,1 – 3,4 kg (n=1127)	69,4	30,6	
o 2,8 – 3,0 kg (n=825)	60,6	39,4	
o <2.8 kg (n=1168)	53,6	46,4	
Gestational Age			
o Mature (n=3941)	81,8	82,9	0,535
o Premature (n=868)	18,2	17,1	
Twin-birth			
o Single (n=9837)	96,5	96,3	0,817
o Twin (n=2654)	3,5	3,7	
Infectious Disease			
o Never (n=910)	19,3	16,2	0,153
o Infrequently (n=2521)	52,4	52,7	
o Frequently (n=1378)	28,3	31,0	
Immunization			
o Complete (n= 1593)	33,6	30,2	0,107
o Uncomplete (n=3212)	66,4	69,8	
Exclusive Breastfeeding			
o Yes (n= 1593)	39,7	43,4	0,088
o No (n=3212)	60,3	56,6	

* multivariate candidate variable

Source: Primary Data, 2019

Table 4. Mother's Characteristics Based on The Age When Pregnant

Mother's Characteristics	Age When Pregnant		P
	Mature	Teenage	
Education			
o Elementary (n= 1100)	22,7	24,0	0,0001*
o Junior HS (n=1172)	22,4	39,0	
o Senior HS (n=1764)	36,9	34,9	
o Graduate (n=773)	17,9	2,1	
Marital Status			
o Have Spouse (n=4705)	98,0	96,3	0,007*
o No Spouse (n=104)	2,0	3,7	
Parity			
o Primipara (n=9837)	64,2	75,5	0,0001*
o Multipara (n=2654)	30,3	23,6	
o Grandmultipara (n=1386)	5,5	0,9	
Physical Activity			
o Light (n=1497)	30,9	33,2	0,476
o Average (n=1212)	25,5	23,3	
o Sufficient (n=1183)	24,8	23,5	
o Heavy (n=917)	18,9	20,1	
Mother's Height			
o Standard (n= 3142)	66,1	61,6	0,034
o Short (n=1653)	33,9	38,4	
Father's Height			
o Standard (n= 5664)	73,4	74,5	0,627
o Short (n=3967)	26,6	25,5	
ANC Quality			
o Good (n= 3093)	29,7	31,4	0,416
o Poor (n=1716)	70,3	68,6	
ANC Quantity			
o Sufficient (n= 3093)	64,2	65,3	0,619
o Insufficient (n=1716)	35,8	34,7	

(number of children 2-3), birth weight, and immunization status. Based on the physical activity of the mother, the heavier the mother's activity, the higher the prevalence of stunting in children under five. Based on the height of the father, the stunting prevalence is higher in children under five from fathers with short body height (≤ 160 cm) (47.2%). Compare to fathers with standard body height (> 160 cm) (33.3%). Based on the number of antenatal care visits (ANC quantity), it shows that the prevalence of stunting is higher in mothers with an insufficient ANC visit, which is less than four times the standard (39.4%) compared to the sufficient (35.1%).

The results in table 5 show that the

mother's age at pregnancy is related to the incidence of stunting. The relation's strength indicates that a woman who is pregnant at the teenage has a risk of 1,256 times (95% OR: 1,001-1,577) to have a stunting toddler. The model of the relation between maternal age at pregnancy and the incidence of stunting by controlling for variables of residence, child's birth weight, father's height, ANC visits, maternal education, environmental health, physical activity, socioeconomic status, and immunization status as confounding variables. Confounding variables associated with the incidence of stunting was the area of residence, child's birth weight, father's height, antenatal care (ANC) visits, maternal education, maternal

Table 5. Relation of Teenage Pregnancy and Stunting Incident in Indonesia

Variable	B	P	OR (95% CI)
Mother's Age When Pregnant			1
o Mature			1
o Teenage	0,228	0,049	1,256 (1,001-1,577)
Residential Area			1
o Urban			1
o Rural	0,252	0,001	1,287 (1,107 - 1,496)
Baby Birth Weight			1
o $\geq 3,5$ kg		0,000	1
o 3,1 - 3,4 kg	0,183	0,076	1,201 (0,981-1,47)
o 2,8 - 3,0 kg	0,480	0,000	1,616 (1,302-2,006)
o < 2.8 kg	0,743	0,000	2,103 (1,73-2,556)
Father's Height			1
o Standard			1
o Short	0,464	0,000	1,590 (1,352-1,87)
ANC Visit			1
o Sufficient			1
o Insufficient	0,737	0,029	2,091 (1,076-4,060)
Mother's Education			1
o Graduate		0,001	1
o Senior HS	0,200	0,082	1,221 (0,95-1,53)
o Junior HS	0,361	0,003	1,435 (1,127-1,827)
o Elementary	0,484	0,000	1,623 (1,269-2,076)
Environmental Health			1
o Good			1
o Poor	0,229	0,067	1,257 (0,984-1,606)
Physical Activity			1
o Light		0,004	1
o Average	0,043	0,669	1,044 (0,857-1,271)
o Sufficient	0,326	0,001	1,385 (1,139-1,684)
o Heavy	0,226	0,035	1,253 (1,016-1,546)
Socioeconomic Status			1
o High			1
o Low	0,137	0,070	1,147 (0,989-1,33)
Immunization Status			1
o Complete			1
o Uncomplete	0,319	0,000	1,375 (1,177-1,607)
Constant	-2,056	0,000	

Overall Percentage = 63,3%

Source: Primary Data, 2019

physical activity, and immunization status.

The relationship model between the age of marriage and the incidence of stunting obtained an Overall Percentage value = 63.3%. It means that the model can explain 63.3% of the causes of stunting by controlling the variables of the area of residence, child's birth weight, father's height, ANC visits, maternal education, environmental health, physical activity, socioeconomic status, and immunization status. The remaining 36.7% is explained by other variables not analyzed in this study.

Table 5 shows that the area of residence is related to the incidence of stunting. Children under five living in rural areas have a risk of 1.287 times (95% OR: 1.107 - 1.496) of experiencing stunting compared to those living in rural areas. Based on the child's birth weight, the lower the birth weight, the higher risk of experiencing stunting. Babies born weighing less than 2.8 kg have a 2.103 times risk (95% OR: 1.73-2.556) of experiencing stunting compared to babies born with or equal to 3.5 kg. Babies born weighing less than 2.8-3.0 kg have a 1.616 times risk (95% OR: 1.302-2.006) of experiencing stunting compared with babies born more or equal to 3.5 kg. There was no difference in the risk of stunting between babies born with a birth weight of 3.1-3.4 kg and 3.5 kg. The fathers' height is also associated with the incidence of stunting. Children with short fathers had a 1.59 risk (95% OR: 1.352-1.87) of experiencing stunting compared to children of fathers with standard height.

Table 5 also shows the relation between antenatal care and the incidence of stunting. Mothers who attend antenatal care visits (ANC) to health facilities are a protective factor for stunting. Mothers who do not take antenatal care are at risk of having stunting toddlers of 2.091 times (OR 95%: 1.076-4.06) compared to mothers who do antenatal care. Based on the mother's education, it shows a pattern that the lower the mother's education, the greater the risk of having a stunting toddler. Mothers with elementary school education (SD) have a risk of 1.623 times (95% OR: 1.269-2.076) compare to graduated mothers. Ones with a junior high school education are 1.435 times more likely (95% OR: 1.127-1,827) to have stunting toddlers compare to graduated mothers. The

daily activities of mothers are also related to the incidence of stunting in children under five. The heavier the physical activity, the greater the risk of having a stunting toddler. Mothers with heavy activity have a risk of 1,253 times (OR 95%: 1,016-1,546) compared to mothers with light activity. Mothers with moderate activity have a risk of 1,385 times (OR 95%: 1,139-1,684) to have stunting toddlers compare to mothers with light activity. Complete immunization during infancy is a protective factor for stunting. Incomplete immunization infants have 1.375 times the risk (95% OR: 1.177-1.607) compare to those who receive complete immunization.

This study proves the relation between teenage pregnancy and stunting. Research findings in urban slum populations with a cross-sectional study with a sample of 482 children 1-5 years found 185 (38.38%) underweight and 222 (46.06%) stunting. The prevalence of malnutrition is higher in children whose mothers are under 20 years of age, and children of educated mothers are better nourished than those who are illiterate (Mittal and Ahluwalia, 2007). The prevalence of stunting in children decreases with the increasing age of the mother. Children born to mothers with poor reproductive health have a lower chance of survival and a higher chance of developing growth failure (stunting, wasting, and underweight) (Prakash et al., 2011). Adolescence is a period of biological growth with the onset of puberty which triggers sexual maturation and reproduction, resulting in physical, psychological and social changes as well as the possibility of pregnancy and childbirth. The consequences of teenage pregnancy and childbirth are serious because of the health and social burdens that the long-term health care costs for mothers and children and the high dropout rate. Adolescents and their babies have a high risk of morbidity and mortality (Aung, 2018).

Pregnancy at the early age of a woman also adversely affects the nutritional status of the fetus and baby. Nutritional disturbances that occur during pregnancy and childhood will have an impact in the short term, including disruption of the metabolic program of glucose, fat, hormones, receptors and genes, growth and muscle mass, as well as body

composition, and impaired brain development. Meanwhile, the long-term impacts include disruption in the child's physical, mental and intellectual development, which is permanent, low immunity and work productivity, the risk of suffering from chronic disease diabetes mellitus, coronary heart disease, hypertension, cancer, and stroke. Marriage age and adolescent pregnancy will have an impact on pregnancy outcomes. A mother giving birth to a baby at a young age, which is under 20 years, is a risk factor for low birth weight (LBW) (Rajagopalan, 2003).

Consequences of pregnancy in adolescence are the high rates of hypertensive disorders of pregnancy, anemia, gestational diabetes, delivery complications, determining an increase in maternal and fetal mortality. Some studies showed an increased trend of prenatal, intrapartum, and postpartum intercurrent events among pregnant adolescents. As to problems with the newborn, gestation during adolescence is associated with higher rates of low birth weight (LBW), preterm delivery, respiratory diseases, and birth trauma, besides a higher frequency of neonatal complications and infant mortality. Considering the high prevalence of adolescent gestation and its consequences, this study had the objective of analyzing complications related to adolescent pregnancy (Azevedo et al., 2014). In mothers who experience pregnancy at a young age, the biological mechanism associated with premature birth is that the blood supply to the cervix and uterus have not fully developed in some adolescents causing the nutrients flow to the fetus during pregnancy is also not good. Low blood flow to the genital organs can increase the risk of infection in the genital organs as well as premature birth. Premature birth is one of the factors that increase the incidence of stunting in toddlers (Sharma, 2013).

Mothers who are pregnant in their teens are also still in their development period, so there is a struggle for nutrients between the fetus and the mother's metabolism. This situation will get worse if the mother's nutritional intake is inadequate so that the fetus will experience growth restriction, thereby increasing the risk of the fetus being born with low birth weight or

premature birth. Both of which are factors in the occurrence of stunting in toddlers. (Prendergast and Humphrey, 2014). The various risks that occur in teenage pregnancy are the basis for the importance of pregnancy prevention efforts in this age group by involving the related sectors.

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