



Risk of early marriage and maternal factors on stunting incidence in Budong-Budong district central mamuju regency, Indonesia

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Abstract

Toddler is health problems, golden period for human survival, in the first 1000 days of life. The global stunting has decreased from 33.1% to 22%, and the number of children affected decreased from 203.6 million to 149.2 million. To analyze the risk of early marriage and maternal factors on the stunting incidence in Budong-Budong District, Central Mamuju Regency. Analytical observation, with a retrospective cohort design. Bivariate analysis on early marriage age obtained a value of 1.37 times; 95% CI = 1.044703-1.807915, and does not reach 1, so is significant. Meanwhile, mother's CED status during pregnancy has a value of 1.31; 95% CI=1.01307-1.708965, and does not reach 1, so is significant. Furthermore, anemia status during pregnancy has a value of 1.73; 95% CI = 1.359363-2.210718 and does not reach 1 so is significant. The labor complication status variable has a value of 1.22 times; 95% CI = 0.9194602-1.632072 and it reaches the value 1, so is not significant. The LBW status has a value of 1.53 times; 95% CI=1.21874-2.139853 and does not reach 1 so is significant. Furthermore, the logistic regression test p value on early marriage age is <0.05 (p=0.038; 95% CI=1.034028-3.169173) and maternal anemia status during pregnancy is also <0.05 (p=0.000; 95% CI=1.837342-6.919353). Variables with higher stunting risk are early marriage age and anemia status in pregnant women in Budong-Budong District, Central Mamuju Regency.

Keywords: Pregnant Women, Marriage, Retrospective Studies, Growth Disorders.

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1. Introduction

Early marriage is a marriage carried out by adolescence under the age of 20 years old who must not be ready to get married. Adolescence is also a period where the pregnancy risks tend to happen due to early marriage (young age), including miscarriage, premature birth, low birth weight (LBW), congenital abnormalities, easily-occurred infection, anemia in pregnancy, pregnancy poisoning, and death [1]. There is a correlation between pregnancy at a very young age and both maternal mortality and morbidity rates. It was claimed that girls aged 10-14 years old are at risk of dying during pregnancy or childbirth five times than the 20-24 years old age group, while this risk doubles in the 15-19 years old age group. The maternal mortality rate of those under 16 years old in the middle- and low-income countries is even six times higher. The child's anatomy that is not yet ready for the pregnancy or childbirth processes, so complications may occur. Pregnancy at a very young age also has a risk of maternal and infant death, birth abnormality or defects, high blood pressure and premature births, babies born with a low birth weight, sexually transmitted diseases, and post-natal depression [2]. Toddler is one of the groups that has a risk of suffering from health problems, since it is a golden period for human survival. In fact, the first 1000 days of life (HPK) is a

period that significantly determines the person's quality of life. Based on a survey conducted by UNICEF, there are about 200 million children under the age of 5 in developing countries in the world, and more than a third of them have not fulfilled their potential to develop. In addition, it was also explained that 149.2 million (22%) children under 5 years old experienced stunting globally. However, the global prevalence of stunting has decreased from 33.1% to 22%, and the number of children affected also decreased from 203.6 million to 149.2 million. In 2020, almost two out of five children with stunting lived in South Asia, while another two out of five lived in sub-Saharan Africa [3]. Based on the results of survey on the Indonesian nutritional status, the stunting rate has decreased from 27.7% in 2019 to 24.4% in 2021 and further to 21.6% in 2022 during the Covid-19 pandemic. In this case, South Kalimantan, North Kalimantan and South Sumatra are the three provinces with the highest decrease of stunting incidence. Meanwhile, West Sulawesi experienced an increase in the number of stunting incidence from 33.8% in 2021 to 35.0% in 2022 [4]. The prevalence of stunting toddlers based on height in accordance with age in West Sulawesi ranks second highest by 35.0%, after East Nusa Tenggara by 35.3%. Furthermore, based on the regency in West Sulawesi, the prevalence of stunting toddlers based

on the height in accordance with age is the highest in Majene Regency by 40.6%, followed by Polewali Mandar Regency by 39.3%, Mamasa Regency by 38.6%, then Mamuju Regency by 33.8%, and Central Mamuju Regency ranked the fifth highest with a stunting incidence of 28.1% and the last one is Pasangkayu Regency by 25.8% [4]. Results of previous study [5] revealed that 64% of women married before the age of 18, 19% of them have stunting children, while 9% experienced wasting and low ECD values. Another study obtained results in line with the previous one, claiming that delaying the age of first birth and increasing the interval between pregnancies has the potential to significantly decrease the prevalence of stunting and improve child development [6]. Another previous study (7), also discovered that early marriage affects women's reproductive health status negatively. Women who marry at an early age often experience unplanned maternal childbirth and abortion, which negatively affects their nutritional status and subsequently children born to mothers with poor reproductive health have a lower chance to survive and a higher chance of suffering from anthropometric failure (i.e. stunting, wasting, and underweight).

2. Materials and methods

This research was carried out through analytical observation, with a retrospective cohort design. In this case, a retrospective cohort design studies the relationship between exposure and disease (outcome) by comparing an exposed group (research factor) and an unexposed group based on disease status (outcome). This retrospective cohort design was carried out by comparing groups of individuals who are similar in many ways but different in certain characteristics (incidence of early marriage, status of CED pregnant women, status of anaemic pregnant women, status of birth complications, LBW status) and in certain outcomes (stunting and not stunting). The samples involved in this research is a part of the population selected as research subjects. The respondents participated are couples of childbearing age who have stunting children as the exposed group and couples of childbearing age who have children who were not stunting as the non-exposed group.

3. Results and discussion

Univariate analysis was carried out to describe the characteristics of each normally distributed variable. The following table shows the results of univariate analysis: Based on the univariate analysis results on Table 1 above, the stunting incidence variable consisted of 108 respondents who were not stunting and 108 respondents who were stunting. Furthermore, in the early marriage age variable, it was found that 107 respondents were not married early, while 109 respondents were married early. The mother's CED status during pregnancy variable consisted of 140 respondents without CED and 76 respondents with CED. In addition, the mothers' anemia status during pregnancy variable consisted of 158 non-anemic respondents and 58 anemic respondents. The variable of birth complications found that 168 respondents do not have birth complications, while 48 respondents have birth complications. Last, the LBW status variable consisted of 195 respondents do not suffer from LBW, while 21 respondents suffer from LBW. This bivariate analysis was carried out to describe two variables

simultaneously to see the proportion of one variable to another variable. The following table presents the bivariate analysis results: Bivariate test analysis as presented in Table 2 above obtained that the variable of early marriage age on stunting incidence concluded that 45 respondents who have stunting children are not married early, while 63 respondents who have stunting children were married early. In this case, the relative risk value (RR) obtained is 1.37 times with the 95% CI value (1.044703-1.807915) and it does not reach the value 1, hence the RR value is significant. Therefore, early marriage possess a risk for stunting incidence in Budong-Budong District, Central Mamuju Regency. The analysis results on the variable of mothers' CED status during pregnancy after testing the stunting incidence showed that 63 respondents did not suffer from CED during their pregnancy with stunting children, However, 45 respondents suffered from CED during their pregnancy with stunting children. In this case, the relative risk value (RR) obtained is 1.31 times with the 95% CI value (1.01307-1.708965) and it does not reach the value 1, hence the RR value is significant. Therefore, mothers' CED status during pregnancy has a risk of stunting incidence in Budong-Budong District, Central Mamuju Regency.

The analysis results of the variable of mothers' anemia status during pregnancy after testing the stunting incidence showed that there were 66 respondents with stunting children who were not anemic, while 42 respondents with stunting children were anemic. In this case, the relative risk value (RR) obtained is 1.73 times with a 95% CI value (1.359363-2.210718) and it does not reach the value 1, hence the RR is significant. Therefore, the mother's anemia status during pregnancy has a risk of stunting incidence in Budong-Budong District, Central Mamuju Regency. The analysis results of the variable of birth complications status after testing the stunting incidence showed that there were 80 respondents with stunting children had no complications and 28 respondents with stunting children had complications. In this case, it has a relative risk value (RR) of 1.22 times and a 95% CI value (0.9194602-1.632072). This reaches the value 1, so the RR is not significant. Therefore, the status of birth complications does not have a risk of causing stunting incidence in Budong-Budong District, Central Mamuju Regency. The analysis results of the variable of LBW status after testing the stunting incidence showed that 92 respondents with stunting children did not suffer from LBW, while 16 respondents with stunting children suffered from LBW. In this variable, the relative risk value (RR) obtained is 1.53 times with a value of 95% CII (1.21874-2.139853) and it does not reach the value 1 so the RR value is significant. Therefore, the LBW status has a risk of causing stunting incidence in Budong-Budong District, Central Mamuju Regency. After the bivariate analysis was carried out, the multivariate analysis was done. The variables included in the multivariate logistic regression analysis are variables with bivariate analysis results that have a p value of less than 0.25. After carrying out the multivariate logistic regression analysis test, variables that have a p value of more than 0.05 are excluded. Furthermore, the logistic regression test was carried out again until there were no more variables that had a p value of more than 0.05.

Table 1: Distribution of univariate analysis results on early marriage and maternal factors on stunting incidence in Budong-Budong District, Central Mamuju Regency

Variable	n	%
1. Stunting Incidence		
Stunting	108	50.00
Not Stunting	108	50.00
2. Early Marriage Age		
Early Marriage	109	50.46
Not Early Marriage	107	49.54
3. CED Status of Mothers during Pregnancy		
CED	76	35.19
Not CED	140	64.81
4. Mothers' Anaemia Status during Pregnancy		
Anemic	58	26.85
Not anemic	158	73.15
5. Birth Complication Status		
Complication	48	22.22
No Complication	168	77.78
6. LBW Status		
LBW	21	9.72
Not BBLR	195	90.28

Table 2: Distribution of bivariate analysis results between dependent and independent variables of the risk of early marriage and maternal factors on stunting incidence in Budong-Budong District, Central Mamuju Regency

Independent Variable	Dependent Variable		RR	95%.C.I	p-value
	Stunting	Not Stunting			
1. Early marriage Age					
Married Early	63	46	1.37	1.044703-1.807915	0.0207
Not Married Early	45	62			
2. Mothers' CED status during pregnancy					
CED	45	31	1.31	1.01307-1.708965	0.0461
Not CED	63	77			
3. Mothers' anemia status during pregnancy					
Anemic	42	16	1.73	1.359363-2.210718	0.0001
Not anemic	66	92			
4. Birth complication status					
Complication	28	20	1.22	0.9194602-1.632072	0.1904
No Complication	80	88			
5. LBW Status					
LBW	16	5	1.61	1.21874-2.139853	0.0115
No LBW	92	103			

Table 3: Distribution of multivariate analysis results on the risk of early marriage and maternal factors on the stunting incidence in Budong-Budong District, Central Mamuju Regency

Stunting Incidence	Odds Ratio	Std.Err	z	P> z I	95% CI
Early Marriage Age	1.810252	.5172285	2.08	0.038	1.034028-3.169173
Mothers' Anemia Status during Pregnancy	3.56556	1.20613	3.76	0.000	1.837342-6.919353
_cons	.5354065	.1165637	-2.87	0.004	.3494362-.8203503

Table 3 shows that the p value for the variable of early marriage age obtained $p < 0.05$ ($p=0.038$; 95% CI=1.034028-3.169173) and mothers' anemia status during pregnancy obtained $p < 0.05$ ($p=0.000$; 95% CI=1.837342-6.919353). Thus, it is concluded that the variables that have a higher risk of causing stunting incidence are early marriage age and anemia status in pregnant women in Budong-Budong District, Central Mamuju Regency. The results of the bivariate analysis on the respondents who were married at an early age revealed that they are at risk of experiencing stunting incidence with the RR value does not reach the value 1, so the RR value is significant. Based on the results of the logistic regression test, the early marriage age has a significant value with p value < 0.05 (0.038). Therefore, the early marriage age is a risk factor for causing stunting incidence in Budong-Budong District, Central Mamuju Regency. Results from the previous research [8]. Found that early marriage and teenage pregnancy of 9.4 million children are estimated to cause them permanently out of school. Due to both cultural and social context in Southeast Asia, as well as the economic struggle experienced by many families in this region due to the pandemic and responses to the COVID-19 pandemic, many of their girls are likely to be married off at an early age. As a result, this group of girls is expected to experience an increase in the number of teenage pregnancy incidences by almost 500,000 in the region. This may result in an additional 800 maternal deaths and more than 13,000 newborn deaths, 150,000 low birth weight births, and 27,000 of those low birth weight children are most likely to experience stunting at the age of two years old. The results of this research are in accordance with the results of previous research conducted in Bangladesh, that teenage pregnancy is an incidence correlated to malnutrition in children. In this case, policies and programs to address poverty and improve women's education can help delay early marriage, reduce early childbearing, and increase growth [9]. The results of this study showed that maternal age is not significantly related to stunting incidence in childhood. Although children born to adult mothers have a slightly higher chance of experiencing stunting compared to adolescence [10,11]. The bivariate analysis on the respondents who suffered from anemia during pregnancy were found to be at risk of having stunting children with the RR value does not reach a value of 1, so the RR is significant. Based on the results of the logistic regression test, the mother's anemia status during pregnancy has a significant value with p value < 0.05 (0.000), then the mother's anemia status during pregnancy is a risk factor for stunting incidence in Budong-Budong District, Central Mamuju Regency. The

results of previous research [12], revealed the results of Spearman rho test with p value = 0.000. This means that the p -value $< \alpha = 0.05$. Since the p -value $< \alpha$ then H_1 is accepted, in which there is a relationship between a history of anemia during pregnancy and the stunting incidence. Anemia during pregnancy is very risky for the growth and development of the fetus and the development of the baby to be born which can cause stunting. Research concerning iron deficiency anemia in pregnant women and stunting has been carried out previously [13] showing that iron deficiency is the most common cause of anemia in pregnant women because the need for iron increases during pregnancy. Anemia during the maternal period will cause hypoxic conditions in the fetal hepatic state, so that hepatic protein synthesis will be hampered. In vitro, low oxygen conditions will inhibit the action of IGF-1 (insulin-like growth factors), especially phosphorylated IGFBP-1 (insulin-like growth factors binding protein). IGF-1 is a growth promoting factor in the growth process and works as a mediator for GH (growth hormone), which functions to increase linear growth. This will underlie the beginning of stunting in children. The results of the bivariate analysis showed that there was no relationship between the mother's history of anemia during pregnancy and the incidence of stunting in toddlers aged 24-59 months old in Kedungtuban Public Health Center working area with a p -value of 0.120 ($0.120 > 0.05$) and an OR value of 1.99. The history of anemia in mothers during pregnancy does not have a significant relationship with the incidence of stunting in toddlers in Kedungtuban Public Health Center working area because there is a program for giving blood supplement tablets to pregnant women which is evenly distributed, with the hope of overcoming the problem of anemia in pregnant women [14]. The factors most consistently correlated with childhood stunting, wasting, and underweight in SSA are low maternal education, increasing child age, child gender (boy), wealth/SES index (poor households), breastfeeding duration (>12 months), low birth weight, mother's age (<20 years), source of drinking water (not improving), low maternal BMI (<18.5), birth size (small), episodes of diarrhea, father's education and low residence (rural) [15]. WHO's target on stunting incidence has raised the nutritional profile and contributed to its place in the post-2015 development agenda. To achieve the global target of 2025, the average reduction rate shall be 3.9% per year. Through integrated global efforts to reduce the prevalence of stunting, such as through the SUN Movement and other important initiatives, this improvement rate can be maintained or accelerated for the next 5 years [16].

4. Conclusions

Early marriage age is a significant risk factor for causing stunting incidence. Therefore, the early marriage age has a relative risk value (RR) of 1.37 times the risk for causing stunting incidence in Budong-Budong District, Central Mamuju Regency. The mother's CED status during pregnancy is not a significant risk factor for causing the stunting incidence in Budong-Budong District, Central Mamuju Regency. The mother's anemia status during pregnancy is a significant risk factor for causing stunting incidence. Therefore, the mother's anemia status during pregnancy has a relative risk value (RR) of 1.73 times the risk for causing stunting incidence in Budong-Budong District, Central Mamuju Regency. Birth complication status is not a significant risk factor for causing stunting incidence in Budong-Budong District, Central Mamuju Regency. LBW status is not a significant risk factor for causing stunting incidents in Budong-Budong District, Central Mamuju Regency.

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