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Analysis of Obstetric Medical Determinant Factors toward Mothers with the Stunting Children

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ABSTRACT

Introduction: Toddlerhood is a period that is very sensitive to the environment so more attention is needed especially the adequacy of nutrition. Nutrition problems, especially stunting in a toddler can inhibit the growth and development of the children. This study aimed to identify various obstetric medical characteristics and determine the obstetric medical determinant factors that most influence pregnant women with the incidence of stunting in Mamuju Regency, West Sulawesi.

Methods: This study was conducted from June until August 2019 in Mamuju Regency, West Sulawesi. The total samples in this study were 88 people who were taken from mothers who had stunting toddlers aged 2-5 years old in Mamuju Regency, West Sulawesi. A total sampling method was used. A cross-sectional with the retrospective approach with a regression test. Data instruments were used questionnaires, observation sheets, and checklists.

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Results: The result of the stunting study was found from the toddler nutrient data from January until June 2020 in West Sulawesi by using total sampling. The researchers found a sufficient influence for the complication during childbirth factor, while the weak relation of the stunting based on the ages, parity, pregnancy spacing, poor obstetric history, comorbid disease, maternal surface, neonatal surface, hemoglobin levels, and the history of Sectio Caesarea (SC).

Conclusion: One of the obstetric medical factors that have a sufficient relationship for causing the stunting for children is the complication during childbirth, while other obstetric medical factors have a very weak relation to the stunting case.

Keywords: Growth disorders; child; mothers; pregnancy

Introduction

Stunting is a linear disorder caused by the malnutrition of nutrient's chronic or the diseases infection chronic that recured and indicated by the z-score of the height by the age (H/A) less than 2 deviation standard (DS) based on the standard of World Health Organization (WHO).^{1,2}

The result of basic medical 2010 by Riskesdas (2010) showed that the national prevalence short toddler under five decreased to 1.2% which is from 36.8% in 2007 become 35.6% in 2010³, where there is a target for the short toddler prevalence need to reduce to be 32% in 2014.^{2,4}

Globally, about 1 from 4 toddlers are stunting. In Indonesia, based on the result of the basic health research Riskesdas (2013), there were 37.2% of toddlers who have stunting. It is known from the total of the percentage of 19.2% short children and 18% were very short.⁵ The prevalence of stunting has increased when it is compared with the result of Riskesdas in 2010 which is 35.6%.^{2,6}

Today, in Indonesia the high prevalence of stunting with children around 0-23 months can be reduced the quality of Indonesian's Human Resources (HR). The quality of humans in Indonesia is lower than in neighboring countries such as Malaysia, Thailand, and Philippines. The ranking of Indonesian's Human Development Index (HDI) in 2011 was 124 from 187 countries, while Malaysia 61, Thailand 103, and Philippines 112.^{1,4}

In central Indonesia, West Sulawesi becomes the largest stunting, which reached 39.7%. This total consists of the very short toddler 14.7% and short toddler around 25%. When the province that has the lowest stunting cases' is Bali that only reacher19.7%, that consist of the very short toddler around 5.2% and short toddler around 14.5%.^{2,6}

Based on the high of stunting case in Central Indonesia, that is the province of West Sulawesi, especially in Mamuju regency. The researchers analyze the obstetric medical determinant factors that are most influence to the pregnant women with the case of Stunting in Mamuju regency, West Sulawesi.

Methods

The research methodology was used the research method like cross-sectional with the retrospective approach. This study was conducted from June until August 2019 in Mamuju Regency, West Sulawesi. The population of this research is the children or toddler stunting in Mamuju regency, West Sulawesi for the June-August 2019 periods. This study was conducted on 88 people who were taken from mothers who had stunting children with the ages of 2-5 years old in Mamuju regency, West Sulawesi. The researchers have used the total sampling method. Data instruments were used questionnaires, observation sheets, and checklists. The test used a regression test to analyzed the data.

The inclusion criteria were stunting toddlers aged 2-5 years old in Mamuju Regency West Sulawesi and mothers who were willing to be research subjects. The exclusion criteria were stunted toddlers whose parents are unknown.

The stunting status consisted of short and very short toddlers. Short toddlers are the toddlers who have a nutritional status based on the length or height, according to its age when compared to the gold standard WHO-MGRS (Multicentre Growth Reference Study)⁷ that short toddlers have z-scores below -2SD and very short toddlers are toddlers who have nutritional status based on length or height with z-scores below -3SD.⁷

The risk ages are age below 20 years old and above 35 years old. The parity is the total childbirth that has been happened to the mothers before the new pregnancy or the childbirth. History of Comorbid Diseases is a condition of pregnant women with a history of pre-pregnancy complications, include hypertension in pregnancy, bronchial asthma, diabetes mellitus, hepatitis, and anemia. The complication during childbirth can be caused by death as well as neonate's disables. A poor obstetric history is a history of pregnancy that is associated with the risk of having hyperemesis, bleeding, abortion, preeclampsia, and eclampsia. Neonates surface explained the normal patient's condition, although the children who have the abnormality include asphyxia, macrosomia, etc. The level of the mother's hemoglobin when they were pregnant consists of the mother who have anemia and did not have anemia. The maternal surface is the normal situation after childbirth although there was the abnormal of mother condition such as poor tonus, ruptured, bleeding, adhesiolysis, and seizures.

Results

The result of this stunting study was obtained from the data on the nutritional status of toddlers under five years old from January until June 2020 in West Sulawesi by using total sampling. The total sample in this study was 88 respondents, which were taken from mothers that have a toddler age 2-5 years old. The researcher was chosen the range aged based on the malnutrition on the height that would be appeared in the long period.

In this study, the researchers found the basic data regarding the status of toddlers nutrition in West Sulawesi in 2019 (Table 1). The stunting assessments used the Height/Ages criteria, in Table 1 showed the total stunting cases based on the Height/Ages on toddler 2-5 years old which are 869 boys and 740 girls with 1609 total of the toddler in Mamuju Regency, West Sulawesi.

Table 1. Initial data on nutritional status based on Height/Age on toddler in West Sulawesi in 2019

Regency / City	Height/Age											
	Very short				Short				Normal			
	0-2 y.o		2-5 y.o		0-2 y.o		2-5 y.o		0-2 y.o		2-5 y.o	
	B	G	B	G	B	G	B	G	B	G	B	G
Majene	335	221	797	622	396	314	967	916	1354	1302	1687	1646
Polewali												
Mandar	467	285	1341	980	998	673	2447	2037	4315	4109	6419	5892
Mamasa	219	113	460	289	308	222	799	615	1234	1089	2646	2419
Mamuju	470	393	869	740	347	264	640	580	2766	2467	3861	3366
North Mamuju	195	85	456	339	273	186	921	752	1720	1690	2981	2854
Centre of Mamuju	33	19	116	72	81	37	198	152	541	465	1080	841
Total	1719	1116	4039	3042	2403	1696	5972	5052	11930	11122	18674	17018

Note: y.o, years old; B, Boys; G, Girls

The characteristics of the respondents that were observed include age, maternal parity, pregnancy distance, comorbidities, poor obstetrics history, complications during childbirth, neonatal, history of cesarean section, hemoglobin levels, and the maternal that can be seen in Table 2.

The most distribution of the ages during pregnancy have the risk as much as 63.6%, and non-risk were 36.4%. The parity of mother distribution who have the highest stunting toddler, that is the primiparous parity as much as 63.6%, while the parity of multiparous mother had 36,4% in Table 2. Then, the distribution of the mothers had the interval pregnancy <1 year has the highest distribution was 72.7%, while the interval pregnancy >1 year have the distribution that was 27.3%. The comorbidities distribution to the mothers that have the biggest percentage than the mother without the comorbidities 76.1% and the mother with the hypertension comorbidities during pregnancy was 15.9%. The poor obstetrics history during pregnancy has the biggest percentage from the mother who did not have poor obstetrics history has the biggest 62.5% distribution in Table 2.

The history of sectio caesarea has a percentage of 21.6%. The history of the fetus likes the preterm or fetal has 23.9% contribution. The history of the surface distribution in neonates, which the good was 54.5%. 86.4% of mothers had no anemia during pregnancy (Table 2).

Table 2. The characteristic of the mothers with stunting toddler based on the obstetric medico's factors in Mamuju Regency

Characteristics	n	%
Ages		
Risk	56	63.6
Non-risk	32	36.4
Parity		
Primiparas	56	63.6
Multiparas	32	36.4
Spacing of Pregnancy		
< 1 Year	64	72.7
> 1 Year	24	27.3
Comorbid		
Normal	67	76.1
Hypertension disorder in pregnancy	24	15.9
Asthma	1	1.1
Diabetes Mellitus	1	1.1
Hepatitis	1	1.1
Anemia	4	4.5
The history of poor obstetric		
Normal	55	62.5
Hypertension	3	3.4
Poor Obstetric	7	8
Antepartum haemorrhage	1	1.1
Premature Rupture of Membranes (PROM)	1	1.1
SC (Sectio Caesarea) history	19	21.6
Post-Partum Haemorrhagic (PPH)	2	2.3
Complication during childbirth		
Maternal	57	64.8
Fetal	21	23.9
Maternal and fetal	10	11.4
Neonatal Surface		
Normal	48	54.5
Asphyxia	38	43.2
Anencephaly	1	1.1
Macrosomia	1	1.1
SC History		
There is no SC History	21	23.9
SC History	67	76.1
Hemoglobin levels		
Not anemia	76	86.4
Anemia	12	13.6

Maternal Surface		
Good	63	71.6
Hypotonia	2	2.3
Ruptured Perineum	8	9.1
Bleeding	6	6.8
Adhesiolysis	7	8
Seizures	2	2.3
Total	88	100

Table 3 showed that a very weak relationship between the age factor on the incidence of stunting with R 0.024, the age at risk (62.5%) consisting of very short stunting status (37.5%) and short stunting status (25%) is more dominant in causing stunting than age not at risk.

A very weak relationship between parity factor on the incidence of stunting with R 0.14, primiparous parity (63.6%) consists of very short stunting status, namely 40.9%, and short stunting status namely 22.7% more dominant stunting causes than multiparous parity. A very weak relationship between pregnancy spacing factor on the incidence of stunting with R 0.094, the pregnancy spacing have <1 year (72.7%) consisting of very short stunting status (40.9%) and short stunting status (31.8%) is more dominant in causing stunting than the pregnancy spacing has >1 year in Table 3.

Table 3. Analysis of factors include age, maternal parity, pregnancy interval, comorbidities, poor obstetric history, complications during childbirth, neonatal surface, history of sectio caesarea, hemoglobin levels, and maternal surface of stunting

Age	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Risk	22	25	33	37.5	55	62.5	0.024
Non-risk	14	15.9	19	21.6	33	37.5	
Total	36	40.9	52	59.1	88	100	
Parity	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Primiparas	20	22.7	36	40.9	56	63.6	0.14
Multiparas	16	18.2	16	18.2	32	32.4	
Total	36	40.9	52	59.1	88	100	
Pregnancy Spacing	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
< 1 Year	28	31.8	36	40.9	64	72.7	0.094
> 1 Year	8	9.09	16	18.2	24	27.3	
Total	36	40.9	52	59.1	88	100	

Comorbid Disease	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Normal	26	29.6	41	46.6	67	76.2	0.084
Hypertension disorder in pregnancy	6	6.8	8	9.1	14	15.9	
Asthma	0	0	1	1.1	1	1.1	
DM	1	1.1	0	0	1	1.1	
Hepatitis	1	1.1	0	0	1	1.1	
Anemia	2	2.3	2	2.3	4	4.6	
Total	36	40.9	52	59.1	88	100	
Poor Obstetrics' History	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Normal	18	20.5	37	42	55	62.5	0.182
Hypertension	3	3.4	0	0	3	3.4	
Abortus	3	3.4	4	4.5	7	7.95	
Internal Hemorrhage	0	0	1	1.1	1	1.1	
PROM	1	1.1	0	0	1	1.1	
SC History	11	12.5	8	9.1	19	21.65	
PPH	0	0	2	2.3	2	2.3	
Total	36	40.9	52	59.1	88	100	
Complicating during the Childbirth	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Maternal	30	52.6	27	47.4	57	64.8	0.332
Fetal	5	5.7	16	18.2	21	23.9	
Maternal & Fetal	1	1.1	9	10.2	10	11.3	
Total	36	40.9	52	59.1	88	100	
Neonatal surface	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Normal	25	28.4	23	26.1	48	54.5	0.216
Asphyxia	9	10.2	29	33	38	43.2	
Anencephaly	1	1.1	0	0	1	1.1	
Macrosomia	1	1.1	0	0	1	1.1	
Total	36	40.9	52	59.1	88	100	

SC History	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Non-SC History	10	11.4	11	12.5	21	23.9	0.076
SC History	26	29.5	41	46.6	67	76.1	
Total	36	40.9	52	59.1	88	100	

HB levels	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Not Anemia	34	38.6	42	47.7	76	86.3	0.196
Anemia	2	2.2	10	11.5	12	13.7	
Total	36	40.9	52	59.1	88	100	

Maternal	Stunting Status						R
	Short		Very Short		Total		
	n	%	n	%	n	%	
Good	26	29.5	37	42	63	71.5	0.01
Hypotonia	1	1.1	1	1.1	2	2.2	
Ruptured Perineum	0	0	8	9.1	8	9.1	
Bleeding	5	5.7	1	1.1	6	6.8	
Adhesiolysis	4	4.5	3	3.4	7	7.9	
Seizures	0	0	2	2.3	2	2.3	
Total	36	40.9	52	59.1	88	100	

Note : R: the result of regression

R value interpretation: R values 0.00 - 0.25 = very weak relationship; R

value 0.26 - 0.50 = sufficient relationship; R value 0.51 - 0.75 = strong relationship; R value 0.76 - 0.99 = very strong relationship;

R 1 value = perfect relationship

Table 3 showed that a very weak relationship between the comorbid disease factor on the incidence of stunting with R 0.084, hypertension disorder in pregnancy (15.9%) has more dominant influence than the other comorbid diseases. A very weak relationship between the poor of the obstetrics' history factor on the incidence of stunting with R 0.182, SC history (21.65%) has more dominant influence than the others poor of the obstetrics' history.

A sufficient relationship between complicating during childbirth factor on the incidence of stunting with R 0.332. Maternal (64.8%) consisting of very short stunting status (47.4%), and short stunting status (52.6%) are the most dominant influence in causing stunting. A very weak relationship between the neonatal surface on the incidence of stunting with R 0.216. The neonatal abnormality with the asphyxia (43.2%) consisting of very short stunting status (33%) and short stunting status (10.2%) are the most dominant influence in causing stunting in Table 3.

Table 3 showed that there was a weak relation between the SC history factor on the incidence of stunting with R 0.076. SC History (76.1%) consisting of very short stunting status (46.6%) and short stunting status (29.5%) are more dominant influence in causing stunting than Non-SC History. The weak relation between Hemoglobin levels factors on the incidence of stunting with R 0.196. The condition that did not have the anemia (86.3%) is more dominant influence in causing stunting than the condition that have anemia.

Discussion

Obstetric medico is the individual condition of the mother during the pregnancy such as age, parity/ total childbirth, pregnancy spacing, congenital disease, bad obstetrics history, complicating during childbirth, neonatal, SC history, HB levels and the maternal that influences with the consideration of childbirth making the decision and hope it can be related with the stunting case.^{8,9}

Based on the distribution data above, the researchers found the significant distribution result of the obstetrics medico factors which is the total of parity that the primiparas parity have a total high distribution. In addition to the parity's total, the researchers also found that the pregnancy spacing of year by the mother has a high contribution and be compared with >1 year mother's pregnancy spacing, then the obstetric medico that discussed the bad obstetrics history has the low distribution.

The existence of the complications during the childbirth process, from the maternal, fetal, or both of them have high characteristics, especially in this research. It can be seen from the high percentage of the complications of the maternal sides that compared with other sides. The neonatal surface can give the significant total especially from the asphyxia diagnosis, which also gives the high distribution history for the stunting case.⁹⁻¹¹

This research has one interesting item, where the distribution of the mother who has the SC history also gives the high percentage toward the children stunting case. The sample of this research was around 2-5 years old. The range of ages chosen caused the effects of malnutrition toward the height that will be seen in a long period. It is also supported the previous research was doing by Haile (2016), who said that the group of children more than 2 years old have the risk to suffer stunting when compared with children less than 1 year old¹². The toddler 0-23 months old have a weak risk to suffer Stunting because ASI protects themselves.¹³⁻¹⁵

The malnutrition problem or called stunting is not easy to recognized by the government and society, even the family because the children have a good condition. The occurrence of malnutrition is not always started by the lack of food and hunger seems like malnutrition for adults. This case of the abundant food condition that is the possible cases for the malnutrition to the children. The risk factors of this research are to determine the probable cases that can be influenced toward the stunting such as ages, parity, pregnancy spacing, poor obstetrics history, congenital disease, complication during childbirth, maternal surface, neonatal surface, hemoglobin levels, and SC history.^{2,8,9}

Age is one of the factors used to analyze this research. The age describes the influence of mother risk age that will be cause for the Stunting output. Based on the regression analysis in Table 3, the researchers found a weak relationship. However, the risk ages are <20 years old and >35 years old appears more dominant for causing the stunting even it just has a weak relation. It is suitable with the researcher that was written by Jocelyn, et al (2017) and explained about the young mother (15-17 years old) has a high risk for causing Stunting for their children than the mother with productive ages. It was because the younger mothers are considered and do not have the experience to protect their children economically and psychologically. Besides the lack of experience, the reproductive organs especially 20 years old for the young mother, medically are not ready at all for doing the obstetrics processes. The mothers under 20 years old are possibly to have a little pelvis and calcium and folic acid in their body do not produce as much as the productive mothers. It can be caused the obstetrics complication, such as the high mortality of children, malnutrition for children, and childbirth recovery that taking for many times because the micro malnutrition.^{13,14}

The parity is the total childbirth before the pregnancy and childbirth. The first childbirth usually has a high risk for the child and mother, but the risk will be decreased in the second or third parity and will be increased in the fourth or next parity. The research was conducted by sub- Sahara African people (2017), it was found that the multiparous and primiparous parity have higher outcoming Stunting than the multiparous parity. It is suitable with the mothers' total parity, where in this research the domination of high stunting is parity, primiparas, even based on the regression analysis found the weak relation between the mother total parity with their Stunting's children.^{15,16}

Short pregnancy spacing will increase the risk of the mother and child. A woman with a short pregnancy spacing like 1 year has a high risk of the mother and child than the woman that has 2-3 years pregnancy spacing before the next pregnancy. It is related to economic pressures as well as to give the nutrition for the children that have short interval pregnancy spacing. However, after analyzed by using the method above, the researchers found that there was a weak relationship between the children Stunting. It is also related to other research that was done by Jocelyn, et al (2017) said that there is no specific relationship between the pregnancy spacing with the Stunting surface. So, even the mother needs to adjust the pregnancy spacing and the childbirth, it does not prevent the child have the risk of Stunting.¹³

Analysis of the history of the disease become a determinant factor, the congenital disease that recorded in a various sample can be received like hypertension disorder during pregnancy, asthma bronchial, diabetes mellitus, hepatitis, and anemia. While the normal sample that researchers found more dominant than people who have the congenital disease. Based on the regression analysis, the researchers found the result that the congenital disease gives the influence and the weak relation toward Stunting case. The statement was supported by Apriningtyas and Kristini (2019) that explained that one of the conditions of the women pregnant is anemia that does not give a significant relation toward children Stunting case.^{15,16}

The history related to the risk is hyperemesis, hemorrhage, abortus, preeclampsia, and eclampsia with founding the complete information, and the researchers hope that the risk of pregnancy will give the pressure of mother condition and the embryo that can be overcome with the better obstetrics. It was supported by another researcher was written by Christiana, et al that explained the dominant factors that can influence the maternal problem in stunting, where the nutrition during pregnancy is influenced for the growth of children in the future. However, the lack of intrauterine malnutrition in pregnant women will impact the growth after the child is born, so it is really important to equalize the nutrition especially the energy and protein during pregnancy. However, based on the analysis, the researchers found the weak influence of bad obstetrics history in Stunting surface. It can be caused by the variable such as bad nutrition during pregnancy and do not be sub-variable that analyzed from this bad obstetric.^{15,16}

The existence of the complication during childbirth is the variable that indicated has a strong influence on stunting. It was based on the regression test that was considered with conditions, like the problem of maternal, fetal, or both of them, then it appears the significant influence of the Stunting output. In the book explained about the pregnancy and childbirth have the complication that can be a cause of death or disability of neonates, especially in a developing country that has the risk and poor management of childbirth. For example, the second childbirth can be the lead of the high asphyxia risk to the embryo that causes for future aspects. It will have an impact on another aspect from child especially when it related to nutrition factor and disease risk for themselves.^{17,18}

Neonatal surface describes the patient's conditions who are in a normal condition, or specific disorder such as asphyxia, macrosomia, etc. The neonatal surface that is related to obstetrics medico has a weak result toward stunting outcome. It could be due to the problem situation and condition on the embryo that is acute and may do not have the influence of the significant stunting, but there were the factors during the children growth until 2 years and leads to the stunting for the children itself. There is a relation of linear height when was born and the weight when the stunting in 0-24 months.^{16,19}

One of the variables in determinant obstetrics medico factors that is the history of SC did not for the mother who has stunting baby. The result of this analysis has a weak relation between SC history and the stunting case. In the research that was done by Syukur and Purwanti (2020), the mother who had the SC history did not do the breastfeeding initiation and it is impacted with failure of ASI for the sensitive and unique periods to facilitate the children to get more nutrition in their early life.^{19,20}

In obstetric medico, one of the determinant factors was to know-how is the mother's hemoglobin levels are anemia or not. It showed how are the quality and the risk that can appear for the stunting baby. However, the research that was done in Semarang in 2019 showed that there is no significant relationship between the mother's HB levels during pregnancy with the stunting for their children. For the regression test that was done before, the researchers found the result is the weak relation of the stunting case.^{16,19}

This maternal condition after the childbirth is the normal condition even there was the abnormal condition of the mothers such as poor tonus, ruptured, bleeding, adhesion and seizures, that was analyzed and found the weak relation based on regression test. Based on the medical health article of Population Reference Bureau (2020), the bad maternal condition after childbirth give significant consequences for the family, especially for their children. That article explained about the children that have the mother and have to the complication of the childbirth or sick, it can be a risk to have malnutrition, the hygiene problems and health problems are really important to give the intervention of increased the maternal health.

The limitation of this research is the time of this research that is too brief so there is no direct response to follow up as a sample, but this research just only used secondary based the data found in the medical facility. The research location is far away between the researcher and our team, in this case, assisted by midwives or the Indonesian Midwives Association in Mamuju, West Sulawesi. Then some of our research samples are located in mountainous areas and there are some isolated areas so that access to the location is difficult.

Conclusion

We found the total significance toward the determinant factor that be inspected. Meanwhile, the result of this research using the analytic method, one of the obstetric medical factors that have a sufficient relationship for causing the stunting for children is the complication during childbirth, while other obstetric medical factors have a very weak relation to the stunting case.

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