

Antenatal care visit frequency of short stature mother as risk factor of stunting among children aged 6 - 23 months in Indonesia (IFLS 5 Study Analysis)

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ABSTRAK

Latar Belakang: Stunting adalah gangguan pertumbuhan linear yang saat ini menjadi masalah utama kesehatan anak di negara berkembang yang berhubungan dengan morbiditas dan mortalitas. Berdasarkan hasil Riset Kesehatan Dasar, prevalensi stunting di Indonesia pada tahun 2018 masih tinggi, yaitu mencapai 30,8%. Salah satu faktor yang mempengaruhi terjadinya stunting adalah tinggi badan ibu yang pendek, dengan prevalensi sebesar 30,5%. Ibu hamil dengan tinggi badan pendek harus memperhatikan kondisi kesehatan selama kehamilan, salah satunya melalui pemeriksaan kehamilan atau antenatal care (ANC) dengan frekuensi pemeriksaan yang sesuai dengan standar.

Metode: Penelitian ini adalah penelitian observasional yang menggunakan data sekunder dari penelitian longitudinal yaitu Indonesia Family Life Survey (IFLS) periode ke-5 yang dilaksanakan pada tahun 2014. Rancangan penelitian ini adalah kohort retrospektif. Analisis bivariat dilakukan menggunakan uji chi square, sedangkan analisis multivariat menggunakan uji regresi logistic. Uji statistik dilakukan menggunakan software Stata v13.

Hasil: Hasil analisis bivariat diketahui bahwa frekuensi ANC ibu dengan tinggi badan pendek memiliki hubungan signifikan dengan kejadian stunting dengan nilai $p=0,04$ ($RR=1,29$; $CI\ 95\%=1,02-1,65$). Hasil analisis multivariat frekuensi ANC dengan kejadian stunting yang mengikut sertakan variabel luar didapatkan bahwa BBLR merupakan penyebab terbesar kejadian stunting ($OR=1,97$; $CI\ 95\%=1,06-3,64$)

Kesimpulan: Frekuensi ANC yang sesuai perlu dilakukan oleh ibu hamil dengan tinggi badan pendek. Hal ini adalah upaya untuk mengoptimalkan status kesehatan, sehingga kejadian BBLR yang merupakan faktor risiko kejadian stunting tidak terjadi. Diperlukan strategi pemerintah untuk meningkatkan frekuensi kunjungan ANC dengan mempertimbangkan komponen pelayanan.

Kata kunci: stunting; ibu dengan tinggi badan pendek; antenatal care; IFLS 5

ABSTRACT

Background: Stunting is linear growth retardation that associated with morbidity and mortality. Prevalence of stunting in Indonesia on 2018 is high, 30,8%. One of the factors that influence stunting is short stature mother. Pregnant women with short stature should concern to their health conditions during pregnancy, through antenatal care (ANC) with frequency that are in accordance with the standards.

Method: This study was an observational study using the secondary data of the 5th wave Indonesian Family Life Survey (IFLS) on 2014. The design of this study was a retrospective cohort. Bivariate analysis was performed using the chi square test, while the multivariate analysis used a logistic regression test. All analyses were performed in Stata v13.

Results: Bivariate analysis showed that the ANC frequency of short stature mother had a significant relationship with stunting ($p=0.04$; $RR= 1.29$; $CI\ 95\%= 1.02-1.65$). Multivariate analysis showed that low birth weight is the main cause of stunting ($OR=1,97$; $CI\ 95\%=1,06-3,64$)

Conclusion: ANC visit essential for short height mother to optimize their health status, so low birth weight which is a risk factor for stunting does not occur. Strategies are needed to improve the frequency and components of ANC services

Keywords: stunting; short height mother; antenatal care; IFLS 5

INTRODUCTION

Stunting is a form of linear growth disorder which is currently a major problem of child health in the world (1). Children are defined as stunting if their length or height for age Z score is below -2 SD (2). Based on Indonesia Basic Health Research (RISKESDAS) result, the prevalence of stunting (short and very short) in 2018 is 30.8. The number of stunting has decline compared to 2013 (37.2%), but there are 18 provinces have a high stunting prevalence (30-40%) (3).

The first 1000 days of life are periods that determine the quality of life in stunting prevention and intervention, so this period is referred to as the "golden period" or "window of opportunity" (4)(5). The consequences of child stunting are disrupted physical growth, a decrease in nerve development and cognitive function, and an increased risk of infectious and degenerative diseases in adulthood (6)(7)the actual number of affected children is still rising in Sub-Saharan Africa. In the Central African Republic (CAR).

Stunting have complex interactions between household, environment, social economy, and culture factor. Maternal factor is an important aspect in household and family factor that influence stunting. Maternal factors that significantly influence the incidence of stunting are malnutrition during preconception, pregnancy, and breastfeeding; short stature mother; early pregnancy; and low birth weight (8)

Maternal height reflects the relationship between genetic, nutritional, social, and environmental factors before pregnancy, and has a major contribution to the nutritional status of children (9). Short stature mothers have a high risk during pregnancy because they are associated with lack of protein and energy reserves, smaller reproductive organ sizes, and limited space for fetal development. This is related to the placenta which can affect fetal development. Furthermore, it will have an impact on infant growth because it is related to the quality and quantity of breast milk (10) (11).

The prevalence of short stature mother in Indonesia is reach 30.5%. During pregnancy, short stature mother (<150 cm height) should pay

attention to health conditions through a healthy lifestyle, which is supported by antenatal care or Antenatal Care (ANC) in accordance with the recommended frequency of visits. ANC visits should begin as early as possible during pregnancy to monitor and improve mother and fetus health; detect complications; overcome complaints of pregnant women; and prepare for birth (12). There are still many pregnant women in Indonesia who do not carry out antenatal care according to the recommended minimum standard visits (frequency 1-1-2). Although the ANC coverage of K1 (first visit) ANC in Indonesia in 2018 has reached 96.1% and ideal K1 has reached 86%, but the coverage for K4 (frequency 1-1-2) ANC is 74.1%, under the National Goal (Renstra 2017) 76%.

Intervention and policies is needed for improving health and nutritional status during pregnancy to realize the optimal nutritional status of children. This will have an impact on achieving the target of stunting prevalence reduction. Furthermore, research related to ANC practice of short stature mothers and stunting is needed through IFLS 5 data.

MATERIALS AND METHODS

This study was an observational study using secondary data from a longitudinal study, the 5th *Indonesia Family Life Survey* (IFLS) conducted in 2014. The design of this study was a retrospective cohort. IFLS 5 research was conducted in 13 provinces in Indonesia consisting of: North Sumatra, West Sumatra, South Sumatra, Lampung, DKI Jakarta, West Java, Central Java, Yogyakarta, East Java, Bali, West Nusa Tenggara, South Kalimantan and Sulawesi South. This research was conducted in September 2014 - March 2015. The population in this study were 566 children aged 6-23 months who have short stature mother (<150 cm) in Indonesia.

The sample in this study were household members with inclusion criteria, including registered children in the IFLS 5 data, with age classification 6-23 months and having short stature mothers (<150 cm). Meanwhile, the exclusion criteria are the incomplete or missing data in the sample related to the data for the variable to be examined.

Dependent variable of this study was the nutrition status, using length/ height for age and categorized as stunting or not stunting. Independent variable was Antenatal Care (ANC) visit frequency, categorized as accordance with the standard (four visit frequencies, 1 visit on 1st trimester, 1 visit on 2nd trimester, and 2 visits on 3rd trimester) and not accordance with the standard. While, control variables were socio economic status, mother's education, residential area, mother's age, low birth weight history, exclusive breastfeeding practice, and infectious disease history.

All analyses were performed in Stata v13. The relationship between the independent variable with the dependent variable and external variables was analyzed using chi-square ($\alpha < 0,05$). Risk ratio is used to know the risk between independent variable and dependent variable. Furthermore, logistic regression model was used to assess the association between independent and outcome variables.

RESULTS

Based on the analysis (**Table 1**), the prevalence of stunting on respondents is high, 42.76%. Most of the respondents (87.46%) have ANC frequency accordance with the standard. The socioeconomic characteristics of the respondents were generally low. Most respondents had low economic status or low family income (60.7%) and had a low level of maternal education (50.18%). Most respondents live in urban areas, which is 55.30%. Most respondents (74.03%) had never experienced an infectious disease.

Bivariate analysis was performed to know the relationship between the dependent variable (stunting) with the independent variable (ANC visit frequency), and the dependent variable (stunting) with external variables (economic status or family income, mother's education, area of residence, mother's age, LBW history, breastfeeding practices, and infectious diseases history). Based on statistical analysis, the ANC visit frequency has significant relationship with stunting, with a p value = 0.04 (RR = 1.29; 95% CI = 1.02-1.65). This shows that children

who have mothers with ANC frequency that are not in accordance with the standard will have 1.29 times the chance of stunting compared to children who have mothers with ANC frequency that are in accordance with the standard.

Table 1. Distribution of respondents characteristic (N=566)

Variable	Number (n)	Percentage (%)
Nutritional Status		
Stunting	242	42.76
Not stunting	324	57.24
Antenatal Care Visit Frequency		
Not accordance with the standard	71	12.54
Accordance with the standard	495	87.46
Socio economic status		
Low	340	60.07
High	226	39.93
Mother's education		
Low	284	50.18
High	282	49.82
Residential area		
Rural	253	44.70
Urban	313	55.30
Mother's age		
Adolescent	46	8.13
Adult	520	91.87
Low birth weight history		
LBW	47	8.30
Not LBW	519	91.70
Exclusive breastfeeding practice		
Non-Exclusive breastfeeding	431	76.15
Exclusive breastfeeding	135	23.85
Infectious disease history		
Have infectious disease history	147	25.97
Don't have infectious disease history	419	74.03

Based on the overall model in the multivariate test, it was found that model 4 is the best model for predicting stunting by considering all variables related to stunting. The results of multivariate analysis on model 4 by controlling the variables of the area of residence, LBW history, and infectious disease showed that the relationship between ANC frequency (OR = 1.38; 95% CI = 0.82-2.31). Based

Table 2. Bivariate analysis of stunting and ANC frequency

Variabel	Status				RR	CI 95%	Nilai p
	Stunting (n)	%	Tidak stunting (n)	%			
Frekuensi ANC							
Tidak sesuai	38	53.52	33	46.48	1.29	1.02-1.65	0.04*
Sesuai	204	41.21	291	58.79			
Status ekonomi							
Rendah	148	43.53	192	56.47	0.92	0.65-1.29	0.64
Tinggi	94	41.59	132	58.41			
Tingkat pendidikan ibu							
Rendah	124	43.66	160	56.34	1.04	0.86-1.26	0.66
Tinggi	118	41.84	164	58.16			
Wilayah tempat tinggal							
Perkotaan	124	43.48	189	56.52	0.85	0.70-1.02	0.09
Pedesaan	118	42.69	135	57.31			
Usia ibu							
Remaja	20	39.62	26	60.38	1.02	0.72-1.44	0.91
Dewasa	222	46.64	298	53.36			
Riwayat BBLR							
BBLR	28	59.57	19	40.43	1.44	1.12-1.87	0.01*
Normal	214	41.23	305	58.77			
Praktek ASI-Eksklusif							
Tidak ASI-Eksklusif	184	42.69	247	57.31	1.01	0.79-1.24	0.95
ASI-Eksklusif	58	42.96	77	57.04			
Penyakit infeksi anak							
Pernah		49.66	74	50.34	1.32	1.00-1.74	0.04*
Tidak pernah		40.33	250	59.67			

RR: Risk Ratio; CI 95%: Confidence Interval 95%; * : significant ($\alpha < 0.05$)

Table 3. Regression logistic analysis between stunting and ANC visit frequency

Variabel	Model 1		Model 2		Model 3		Model 4	
	OR	p	OR	p	OR	p	OR	p
Frekuensi ANC								
Tidak sesuai	1.64(0.99-2.70)	0.052	1.52(0.86-2.40)	0.103	1.54(0.93-2.56)	0.090	1.56(0.94-2.60)	0.080
Sesuai	1		1		1		1	
Wilayah tempat tinggal								
Perkotaan	-	-	0.79(0.56-1.11)	0.176	0.79(0.56-1.11)	0.175	-	-
Pedesaan			1					
BBLR								
BBLR	-	-	1.97 (1.06-3.64)	0.031*	1.98(1.07-3.66)	0.028*	2.02(1.09-3.74)	0.024
Normal			1		1		1	
Penyakit infeksi anak								
Pernah	-	-	1.43(0.97-2.09)	0.066	-	-	1.43(0.97-2.09)	0.065
Tidak pernah			1				1	
R ²	0.005		0.019		0.014		0.016	
AIC	772.9		768.3		769.7		768.2	
N	566		566		566		566	

OR: Odds Ratio; CI 95%: Confidence Interval 95%; AIC: Akaike's Information Criterion; * : bermakna/ signifikan ($\alpha < 0.05$)

on research, it can be concluded that there are many factors that cause stunting, but the most dominant factor is LBW history.

DISCUSSION

Based on bivariate analysis, it is known that ANC visit frequency has a significant relationship with the incidence of stunting, with p value = 0.04 (RR = 1.29; 95% CI = 1.02-1.65). Most respondents generally had ANC visit frequency that was in accordance with the standard (four visits ANC), which was 87.46%. This is likely to cause the majority of respondents get more ANC service components and in accordance with gestational age, along with the high frequency of ANC visits. This will have a good impact on maternal and child health status.

The results of this study are in line with other studies which state that there is a relationship between ANC frequency and stunting (13)the poor nutrition of women before and during pregnancy and the prevailing poor sanitation practices in households and communities are important drivers of stunting, most likely because of underlying conditions of women's status, food insecurity, poverty, and social inequalities. With this evidence in mind, UNICEF Regional Office for South Asia convened the Regional Conference: Stop Stunting: Improving Child Feeding, Women's Nutrition, and Household Sanitation in South Asia (New Delhi, November 10–12,2014 (14). The risk of stunting will decrease if the frequency of the ANC is performed by a professional health worker, such as a doctor or midwife (15). Access to ANC during pregnancy is one predictor of linear growth disorders, including stunting (13)the poor nutrition of women before and during pregnancy and the prevailing poor sanitation practices in households and communities are important drivers of stunting, most likely because of underlying conditions of women's status, food insecurity, poverty, and social inequalities. With this evidence in mind, UNICEF Regional Office for South Asia convened the Regional Conference: Stop Stunting: Improving Child Feeding, Women's Nutrition, and Household Sanitation in South Asia

(New Delhi, November 10–12,2014. ANC provides services that aim to improve health status during pregnancy, including health promotion activities, screening and diagnosis, and disease prevention (12). The frequency of ANC visits that have been carried out according to standards is positively related to the quality of ANC services received (16)completion of the recommended four or more ANC visits was only 32%. This study was aimed to examine individual, household and community level potential determinants of completing the recommended visits in the country. The 2014 Ethiopian Mini Demographic and Health Survey data were used. Among women aged 15–49 years 3694 who had given birth in the 5 years preceding the survey were included in the analysis. The robust standard error method of generalized estimation equations were used for binary outcome variable from the clustered data. Only 33.0% (95% CI 31.5% 34.5%. In addition, the frequency of ANC visits has a positive relationship with the number of ANC service components. The higher the ANC frequency, the more service components received during ANC (17)the items of ANC services covered by ANC visits greatly influence the effectiveness of the ANC services. Recently the World Health Organization (WHO).

During ANC, pregnant women can get health information with sufficient quantity and quality in improving the health status of mothers and children (18). The higher the frequency of pregnant women doing ANC, the more exposure to health information obtained. One of the information is obtained through nutrition counseling. Nutrition counseling during pregnancy when the mother carries out ANC has a large impact on the child's growth, especially for prevent stunting. Nutrition counseling is given for prevent and control prenatal infectious diseases and subclinical conditions that limit children's growth, and stimulate early childhood development. Information provided during ANC is related to the practice of breastfeeding, child feeding, and prevention of childhood infectious diseases (14).

The frequency of ANC visit in accordance with the standard can be achieved not only by considering the right number of visits, but also

the timeliness of the start of the first ANC (1st trimester). This is important due to the associated with early detection and management of pregnancy complications. The start of the right first ANC will make pregnant women have sufficient number of visits and adequate services to find out possible complications during pregnancy, so that treatment can be done appropriately. In addition, an increase in visits during the third trimester (at least 2 times) must be fulfilled during pregnancy. The third trimester is the period with the highest risk for pregnancy complications, such as pre-eclampsia (19) actively sought it, and passively received it mainly from three sources: healthcare providers (HCPs). Prompt and proper handling of pregnancy complications can prevent further problems in maternal and child health (20) several researchers have documented its impact on intermediate variables affecting survival such as birth weight. These studies have also highlighted the problems of causality that are typically not taken into account when estimating the effects of antenatal care on skilled birth attendance. In this study, we revisit this relation in the rural areas of four countries: Ghana, Kenya, Uganda and Tanzania. Using a structural equation modeling approach that corrects for endogeneity, in all four countries we find that the usual simpler probit (or logit).

There are many factors that cause stunting, but the most dominant factor is the history of LBW. The existence of LBW problems is related to the health status of the mother during pregnancy. One of the factors causing the occurrence of LBW is the short stature mother and low nutritional status of the mother (21). Efforts to improve optimal nutritional status, such as anemia prevention and weight gain during pregnancy that are appropriate during pregnancy are needed so that children are born with a normal weight, so as to reduce the risk of stunting.

CONCLUSION AND RECOMMENDATION

Children aged 6-23 months who have short stature mothers with antenatal care frequency that is not in accordance with standards have a risk factor for the occurrence of stunting. The low birth weight variable has the biggest risk factor for the stunting

incidence of children aged 6-23 months who have mothers with short height. Quality ANC practice, which is to meet the recommended frequency of visits, is necessary for pregnant women with short height. Good ANC practice is needed to optimize the health status of pregnant women, so that low birth weight, which are risk factors for stunting, do not occur.

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