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Low Socioeconomic Status among Adolescent Schoolgirls with Stunting

Sitti Patimah ¹⁺, Andi Imam Arundana ², Ida Royani ³, Abdul Razak Thaha ²

⁶

¹ Nutrition Department, School of Public Health, Universitas Muslim Indonesia

² Nutrition Department, School of Public Health, Hasanuddin University

³ Nutrition Department, School of Medicine, Universitas Muslim Indonesia

Abstract. In the accelerating decline of maternal mortality, health and nutritional status of adolescent schoolgirls should get more concern by all stakeholders due to adolescence could break intergenerational cycle of poor nutrition in the future. Social and economic aspects are one of the important determinants that influence health and nutritional status adolescent schoolgirls. This study aimed to assess the influence of social-economic factor in the incidence of stunting in adolescent schoolgirls using a cross sectional study design. Subject of the study were 601 of 10th grade girl students in five high schools in Maros district. To determine the stunting in adolescent schoolgirl used height-for-age indices (<-2 SD HAZ-score). SPSS version 18 was used to analyze the data. The prevalence of stunting was 23.6%, found more in subjects who had siblings ≥ 2 persons (91.5%), a large family more than 4 people (73.2%), low income family (69.1%), and low education fathers (62.4%) as well as lower education mothers (68.3%). However, only the number of siblings was significantly associated with the incidence of stunting in girls based on the chi-square test ($p=0.008$). It was concluded that adolescent schoolgirls who were stunted from lower socioeconomic groups. Therefore, socioeconomic empowerment of the family should be an important point to address the problem of chronic malnutrition in adolescent schoolgirls.

Keywords: socioeconomic, adolescent, schoolgirls, stunting, nutrition disorders

1. Introduction

Attention to adolescents is important to achieve successfully a number of public health agenda, including reducing maternal mortality [1]. Lancet series (2013) showed that not only focus on the first 1,000 days of life, nutrition status on adolescent girls also needs more attention as the crucial period that support health and survival of mothers, fetal growth, growth and development of early childhood later on [2]. Therefore, adolescent girls must be at the center of a life cycle approach [3].

One of nutritional problems in adolescent girls is short stature that reflected a long-term process which affects the poor growth in children. From 2010 to 2013, the prevalence of stunting in adolescents aged 16-18 slightly increased from 31.2% to 31.4% [4] [5]. The study results by Patimah (2014) on the adolescent girls in Maros district found that the prevalence of stunting was 26.5% [6]. Stunting resulted by long term inadequate nutrient intake or linear growth disturbance due to the failure to reach genetic potential as a consequence of chronic malnutrition [7]. Stunting in adolescent girls (height <145 cm) is likely to have a risk of obstetric. Proven by the study in Bangladesh which showed 23% of pregnant adolescent girls aged 16 yo has risk of obstetric [8]. In Indonesia, the age of early marriages on girls (<20 years) is still relatively high (4.8% at age 10-14 years, and 41.9% at age 15-19 years), and it increases the risk of obstetric [4].

⁺ Corresponding author. Tel.: + 62 411455666; fax: +62 411455695.
E-mail address: imhasudirman@gmail.com.

Adolescent health is the result of complex interaction among social determinant, risk factor, and protective of health, as well as a determinant of biological and transition of the social role of adolescent. Social determinant which contribute negatively to health status and health behaviors of adolescence is the structural determinant (poverty and inequality of gender) and proximal or intermediate (intra-familial violence, the connectedness of adolescents to family and school, the quality of the family environment, food availability) [1], [9]. From several factors that cause malnutrition, poverty, underdevelopment, low socioeconomic status, and other social determinants are major contributors of malnutrition [3]. Therefore, this study aimed to examine the association of socioeconomic determinants of the family and incidence of stunting in adolescent schoolgirls in rural areas.

2. Methods

This study was a cross-sectional design and conducted in five high schools in Maros district, South Sulawesi. This study conducted from March to April 2015 and given an approval by the Ethics Committee from Health Research Department of Medical Faculty of Hasanuddin University, Education Hospital of Hasanuddin University, and Public Hospital of Dr.Wahidin Sudirohusodo (Registration No: UH15020073). By total 610 population from 10th grade, we could only get 601 adolescent girls as samples because 9 students did not participate to this study due to illness and absences at the school during data collection. 10th grade student was chosen due to this study was the part of a longitudinal study that has been conducted in last three years.

Data on characteristic (age, number of siblings, family member) were collected by using the structured questionnaire, while socioeconomic variables including family income and parent education. Height measurement using microtoice with accuracy 0.1 cm. To assess stunting, anthropometrics indices used was height for age z-score (HAZ-score) with cutoff point <-2 SD. data were processed using the statistical package for social sciences (SPSS) for windows version 18, and were analyzed by chi-square test.

3. Results

Table 1 shows that the average age of respondent were ± 16 years (59.1%) and only 1.2% aged 18 years. Related to the menstrual age, average of students starts the menstruation at the age of 13 years (41.1%), and then only a few students never menstruation (1.3%). Almost a quarter of the subjects were stunting (23.6%) and 10.3% wasting. Allowance (pocket money) received per day of the family as much as $\pm$ IDR 13400 and less than half of it was used to buy snacks at school ($\pm$ IDR 6500).

Most of the subjects had siblings ≥ 2 (85.2%) and the number of family members > 4 (72.5%). These variables are commonly in stunted subjects (91.5% and 73.2%, respectively). Based on the socioeconomic characteristics of parents, it was found that the majority of students' parents were in low socioeconomic, proved by more 64.1% of the subjects had a low monthly income (IDR < 2 million). The education level of mothers and fathers were low (68.8% and 62.4%, respectively). More than three-quarters (87.8%) mothers as housewife and most of the student's father works as farmers (37.9%). Majority of stunted students from low socioeconomic family. The number of siblings (≥ 2) was significantly associated with the incidence of stunting in adolescent girls ($p = 0.015$) (Table 2).

4. Discussion

Stunting is an expression of a long term chronic nutritional disorder. This study found a quarter of adolescent girls classified as stunting and in line to the study in Matlab Bangladesh which 28% of adolescent girls were stunting [8]. In contrary, lower result was shown by Melaku et.al (2015) [10] in Northern Ethiopia (21.2%). Study by Barman et.al. (2015) [11] and Rousham et al., (2016) demonstrated higher result (33.0% and 35.3%, respectively) [12].

Number of siblings was a factor which related to incidence of stunting in adolescent girls, where more than one sibling has a higher propensity to be stunted (91.5%). The number of siblings may be relating to distribution of parental attention, including feeding practice and food distribution in the family. Food would be given to the other siblings, moreover if it has occurred since infancy and childhood so it will increase the

risk of children getting inadequate intake. Family planning indirectly affects nutrition via its impact on feeding practices. When births are well spaced, mothers have more time, energy, and resources to adequately breastfeed and feed their young infants and children [13]. Bird (2007) concluded that the numbers of children who have many siblings tend to be malnourished, and resources in the family will be distributed directly to the younger children. The older children or adolescent potentially receive less duration of attention from their parents [14]. Another study support these findings, a study in Delhi India showed that the number of siblings is a major predictor of energy and protein intake in girls [15]. Furthermore, it was close to that reported by Mushtaq et.al (2011) which shows high number of siblings is the factor that significantly correlated with the incidence of stunting in children 5-12 years in Lahore Pakistan [16].

Table 1. Characteristic of adolescent schoolgirls

Characteristic	Mean $\pm$ SD	Min-Max	N	%
Age (yo)	15.7 $\pm$ 0.6	14 – 18		
• 14			8	1.3
• 15			178	29.6
• 16			355	59.1
• 17			53	8.8
• 18			7	1.2
Menstruation's Age (yo)	13.1 $\pm$ 0.9	10 – 15		
• No Menstruation			8	1.3
• 10			1	0.2
• 11			13	2.2
• 12			122	20.3
• 13			247	41.1
• 14			191	31.8
• 15			19	3.2
HAZ-Score	-1.51 $\pm$ 0.7	-4.20 – 0.84		
• Stunted			142	23.6
• Normal			459	76.4
BAZ-Score	-0.65 $\pm$ 1.1	-3.61 – 2.89		
• Wasting			62	10.3
• Normal			498	82.9
• Overweight/Obes			41	6.8
Pocket Money (IDR. per day)	13401 $\pm$ 7.276.6	2.000 – 50.000		
Money buy snack (IDR.per day)	6518.9 $\pm$ 3660.2	1.000 – 34.000		

Table 2. Relationship of Socioeconomic factors With Stunting on adolescent schoolgirls

Characteristics	Stunted	Normal	Total	p Value
Number of siblings (prs) ^g	3.38 $\pm$ 1.7	3.13 $\pm$ 1.8	3.19 $\pm$ 1.8	0.015
• 1	12 (8.5)	77 (16.8)	89 (14.8)	
• ≥ 2	130 (91.5)	382 (83.2)	512 (85.2)	
Family size (prs) ^g	5.70 $\pm$ 1.8	5.54 $\pm$ 1.8	5.58 $\pm$ 1.8	0.914
• ≤ 4	38 (26.8)	127 (27.7)	165 (27.5)	
• > 4	104 (73.2)	332 (72.3)	436 (72.5)	
Parent's income (IDR/Mo) ^g				0.295
• ≥ 2 million	25 (30.9)	102 (37.4)	127 (35.9)	
• < 2 million	56 (69.1)	171 (62.6)	227 (64.1)	
Mother's education ^g				0.917
• High (more than junior high school graduate)	45 (31.7)	141 (31.0)	186 (31.2)	
• Low (below junior high school graduate)	97 (68.3)	314 (69.0)	411 (68.8)	

Father's education					
•	High (more than junior high school graduate)	53 (37.6)	189 (42.2)	242 (41.1)	0.377
•	Low (below junior high school graduate)	88 (62.4)	259 (57.8)	347 (58.9)	
Mother's occupation ^g					
•	Farmer	2 (1.4)	1 (0.2)	3 (0.5)	0.151
•	Entrepreneur	6 (4.2)	27 (5.9)	33 (5.5)	
•	Labor	0 (0.0)	2 (0.4)	2 (0.3)	
•	Civil servant	6 (4.2)	20 (4.4)	26 (4.3)	
•	Private servant	1 (0.7)	1 (0.2)	2 (0.3)	
•	Housewife	125 (88.0)	403 (87.8)	528 (87.8)	
•	Others	2 (1.4)	5 (1.1)	7 (1.2)	
Father's occupation ^g					
•	Labor	7 (4.9)	21 (4.6)	28 (4.7)	0.126
•	Civil servant	11 (7.7)	60 (13.1)	71 (11.8)	
•	Private servant	13 (9.2)	29 (6.3)	42 (7.0)	
•	Entrepreneur	41(28.9)	131 (28.5)	172 (28.6)	
•	Farmers	57 (40.1)	171 (37.2)	228 (37.9)	
•	Others	13 (9.1)	47 (10.2)	60 (10.0)	

= n (%)

This study show that family size, family income, education and occupation of the parents did not relate significantly ($p > 0.05$) with the incidence of stunting. However, the proportion of stunting 3 times more in large family size (>4 persons), doubled in low income family (IDR <2 million per month) as well as low education of parents. In addition, the problem of stunting occurred in those who have mother does not working and the occupation of the father were farmers. The results of Indonesia basic health research (2010) supports this study in which the prevalence stunting in adolescents aged 16-18 years were in households with the lowest economic circumstances (40.7%¹¹). Education level of father is inversely related to prevalence of stunting and shows the lower education the higher prevalence of stunting. The highest prevalence of stunting in head of household were in those who works as a farmer / fisherman/labor (38.2%) [4]. Furthermore, studies in Cairo in line with this research that 90.7% of teenage mothers who stunting is not working (housewife) [17]. Results of other studies support these findings, as reported by Deshmukh et.al (2013) that children who have parents well educated and low-income and working as a laborer have a higher chance to get stunting. Education and work mothers do not contribute significantly to stunting [18]. These results are also in line with the findings of Melaku et.al (2015) that the majority of the work is a farmer father and have a large family (>4 persons), but both these variables are not associated with the incidence of stunting in adolescents girls, ($p = 0.234$ and $p = 0.071$ ¹⁶ respectively), father's education ($p = 0.090$) and mother ($p = 0.928$) was not associated with the incidence of stunting in adolescents [10].

5. Conclusion

The incidence of stunting in adolescent schoolgirls tend to be on the low socioeconomic family and number of siblings was significantly associated with stunting incidence. Our findings, in conjunction with other evidence, suggest that it may be family empowerment and family planning program play a pivotal role in prevention of stunting. Nevertheless, further works needs to investigate deeply the correlation of stunting with any other factors such as environmental and feeding practices that may increase the incidence of stunting. In the future, the impact to the obstetric and gynecology problem during pregnancy for those are stunting should be considered by all stakeholders.

6. Acknowledgements

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