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Child care practice as a risk factor of changes in nutritional status from normal to stunting in children under five

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ABSTRACT

Background: *There was 9.5% of stunted infants aged 7-12 month changed to normal nutritional status at the age of 2 years. Integrated programs, health, hygiene, and stimulation have been successful to decrease the stunting proportion by 17.2%.*
Objectives: *The aim of this study was to analyze the relationship between child care practice and changes in nutritional status from normal to stunting in children under five.*
Methods: *This study was a further analysis from the results of cohort data collection for 20 villages of the City and District of Tangerang in 2008-2011. The number of subject in this study were 571 n children under five. Data were analyzed by chi-square test.*
Results: *The results showed that the child care practice (OR=1.63, 95% CI), hygiene and environmental sanitation (OR=1.63, 95% CI) and health care aspects (OR=1.76, 95% CI) were significantly associated with changes in nutritional status from normal to stunting.*
Conclusion: *Child care practice was associated with changes in nutritional status from normal to stunting in children under five.*

KEYWORDS: *stunting, child care practices, children under five*

INTRODUCTION

Stunting is identified by assessing a child's length or height (recumbent length for children less than 2 years old and standing height for children age 2 years or older) and interpreting the measurements by comparing them with an acceptable set of standard values (1). Stunting occurring in childhood is a risk factor for increased mortality, cognitive abilities, and low motor development and unbalanced body functions (2). The prevalence of stunting among *under five children* in Indonesia is still relatively high compared to the figure in Asia which reached 35.6% in 2010 and increased in 2013 (37.2%) (3).

Stunted children had a high risk for chronic illness, such as obesity and impaired glucose intolerance. A study conducted on children in Brazil showed that stunting associated with fat oxidation and body fat storage. Stunting may also increase the risk of hypertension. A study in Jamaica, Gaskin et al found that stunting that occurred in the first 2 years associated with systolic blood pressure at age 7-8 years (4). A survey conducted in Russia, Brazil, the Republic of South Africa, and China in children aged 3-6 years and 7-9 years showed a significant relationship between overweight and stunting in all countries. In the study, the risk ratio of overweight events in stunted children ranged from 1.7 to 7.8 (Popkin et al., 1996).

One of the factors that affect the nutritional status of under five children is the care provided by their parents. According to UNICEF (1997), care is defined as a way of feeding, nurturing, teaching and guiding children by individuals and families. Indirect parenting patterns will affect the nutritional status of children. Jus'at et al (2000) reported that parenting was very important for the growth and development of infants and children under five. Parenting in practice includes several aspects. Range et al. (1997) reported that parenting patterns could be grouped into four: feeding patterns, hygene care patterns and health, parenting related to psychosocial, and maternal care and social support system.

The results of cohort studies conducted in City and Regency of Tangerang. Tangerang in 2011 indicated that there was a high prevalence of stunting

in infants at 20.6% for 3 years (Rahayu, 2011). Based on the stunting condition of the children under five, further analysis was needed about the causes of high prevalence between stunting in infants, especially related to the pattern of care. The purpose of this study was to analyze the relationship of parenting pattern with changes in nutritional status from normal to stunting in toddlers in City and Regency of Tangerang.

MATERIALS AND METHODS

Design, time and place of research

This study was a further analysis of cohort studies in 2008 and 2011. Data were obtained in the form of measurements of body length of infants aged 6-12 months in 2008 and height measurements in 2011 were done after the subjects aged 3-4 years. Data collection in 2011 had been granted by a research permit from the Ethics Committee of the Faculty of Medicine, Universitas Gajah Mada (UGM) with Number: KE/FK/625/EC. Data collection was conducted in Kota and Kabupaten Tangerang Banten Province, covering 20 villages. Processing and data analysis of stunting changes status was done in January-October 2017.

The research variables analyzed were body length data in 2008, height in 2011 and data of family care pattern of children under five. Foster parenting was measured based on three aspects, namely psychosocial aspects, hygiene aspects and environmental sanitation and health care aspects. Parenting instrument used has been tested for the validity and the resulting Cronbach of alpha value was 0.624, which shows the parenting instrument can be said to be reliable. Parenting is said to be good if the total score obtained by the respondent is more than equal to the mean. Psychosocial aspects included the efforts of the mother / caregiver in the way of feeding, providing education in socializing and efforts to be close to the child. Aspects of hygiene included aspects of how to maintain personal health for children and the mother's efforts to maintain the environment around the house while the health care aspect was an effort made by caregivers in maintaining the child's health and how to handle when the child is sick.

Number and Sampling Methods

The population in this study were all infants weighed on data collection activities conducted by PT Care Indonesia in 2008 and 2011 by Faculty of Health UHAMKA. The data were collected by purposive sampling with inclusion criteria of subjects with complete data on parenting pattern and height in 2011. The number of babies in 2008 was 1235, and which was successfully traced in 2011 and fulfilled 664 children under five. Sample inclusion criteria were samples of 6-12 months old children that had normal nutritional status. The number of samples analyzed amounted to 571 samples.

Processing and analysis of data

Data processing stage consisted of the selection of variables for analysis, cleaning data, and recode the variables into category data. Stunting status change was a dependent variable. Independent variables in this research were parenting consisting of psychosocial aspect, hygene aspect and environmental sanitation, and health care aspect. Varibale stunting changes were categorized into normal to stunting and normal remains normal. Parenting patterns were categorized into less and good parenting patterns. Furthermore, data analysis were be done with univariate and bivariate analysis. Univariate analysis was performed to obtain the description of the frequency distribution and the proportion of the various variables studied. Bivariate analysis was done to obtain the relationship between independent and dependent variable by using Chi-square test with $p < 0.05$.

RESULTS

The result of the study showed that the samples of 6-12 months old children that were changed to stunting were found as many as 176 samples (30.6%) and the samples that still have normal status were 69.4%.

The results showed that half (52%) of respondents have a good parenting pattern. Viewed from each aspect, the pattern of care related to health care on the respondents was still lacking.

One of the causes of stunting incident was mother's child care practice pattern in children

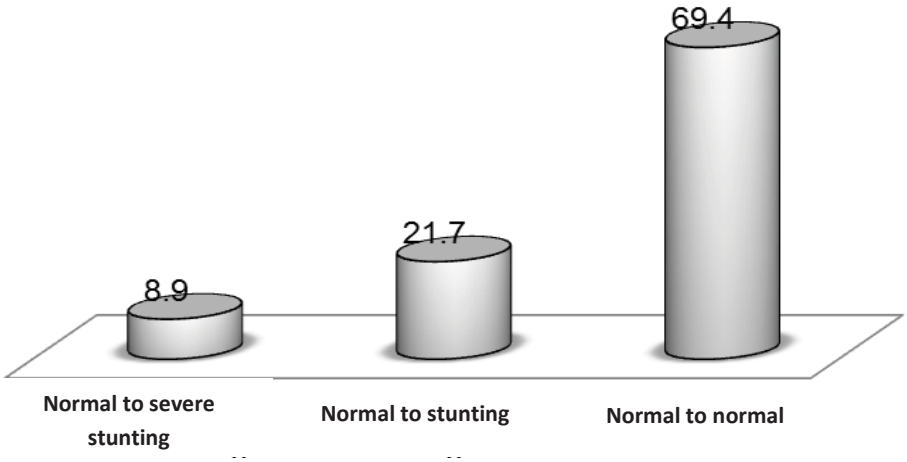

Figure 1. Change of Stunting Status

Table 1. Distribution of respondents based on parenting

Child Care Practice	n	%
Child Care Practice		
Poor	271	47.5
Good	300	52.5
Psychosocial aspects		
Poor	272	47.6
Good	299	52.4
Aspects of hygiene and environmental sanitation		
Poor	230	40.3
Good	341	59.7
Aspects of health care		
Poor	304	53.2
Good	267	46.8

Table 2. Distribution of stunting status changes based on child care practice

Child Care Practice	Normal to *Stunting*		Normal remains Normal		Total		OR	*p-value*
	n	%	n	%	n	%		
Child Care Practice								
Poor	101	37.3	170	62.7	271	100.0	1.81	**0.001**
Good	74	24.7	226	75.3	300	100.0		
Psychosocial aspects								
Poor	90	33.1	182	66.9	272	100.0	1,25	0.228
Good	85	28.4	214	71.6	299	100.0		
Aspects of hygiene and environmental sanitation								
Poor	85	37.0	145	63.0	230	100.0	1.64	**0.007**
Good	90	26.4	251	73.6	341	100.0		
Aspects of health care								
Poor	110	36.2	194	63.8	304	100.0	1.76	**0.002**
Good	65	24.3	202	75.7	267	100.0		

under five. In line with the results of this study that child care practice was associated with stunting changes, in which normal-born children will generally remain normal with good maternal care patterns (**Table 2**). The results showed that hygiene and environmental sanitation as well as health care were associated with stunting events.

DISCUSSION

The process of stunting in children in a region or poor area begins at about 6 months and continues until the age of 18 years. Stunting appears mainly in the first two to three years of life. At the age of the children, nutritional needs are very large compared to later ages. At that age, the growth rate reached the peak and the fastest so it required a lot of nutrients. For older children, stunting was a reflection of growth failure (5). In Figure 1 it is seen that children who were initially normal over time experienced stunting. There were 30.6% of children who have stunting (severe and stunting) at the age of 3-4 years, whereas initially normal.

Stunting illustrates a long history of malnutrition and inadequate health and care conditions. Child care practice and health care were direct factors associated with the incidence of infection (UNICEF, 1990). The incidence of infection causes the nutrients difficult to be absorbed by the body and resulting in inhibition of growth. Hygiene and poor sanitation causes inflammatory bowel disorders that reduce nutrient absorption and increases the permeability of the intestine called Environmental Enteropathy (EE). Where there is a transfer of energy, which should be used for growth but ultimately used to fight infections in the body. This can cause a normal child to be stunting. A study in Lubango, Angola showed that stunting was associated with intestinal infection by A. lumbricoides parasite worms (OR = 3,276) (6). Diarrhea is one of the most common infections in children, especially in poor sanitary and hygiene conditions. Children with diarrhea had 0.38 cm shorter than children without diarrhea by 2 years of age (7).

Maternal care is the behavior of mothers in the care of their infants. Self-behavior based on Notoatmodjo (2005) is influenced by attitude and knowledge (8). Good child care practice is a very important factor to ensure optimal child growth. In poor families, the availability of food in households is not necessarily sufficient, but mothers who understand how to care for children can utilize limited resources to ensure the child's growth reaches optimal conditions (Wahdah, et al., 2015). Mothers with good child care practice tended to have children with good nutritional status as well (9).

In this study parenting pattern showed a relationship with changes in normal nutritional status to stunting (OR = 1.81). Maternal child care practice patterns in feeding in the form of breastfeeding and complementary feeding of premature milk were associated with stunting in children (Adair & Guilkey, 1997). Health status was one aspect of child care practice that can affect the nutritional status of children towards the better. This study showed that health care aspects as part of child care practice have a significant relationship with the change of stunting status (OR = 1.76).

Health services are access or affordability of children and families to prevention of illness and health care such as immunization, pregnancy examination, delivery assistance, child weighing, health and nutrition counseling, and good health facilities such as Integrated Service Post, Community Health Centers, midwife or doctor practice, and clean water supply. Inadequate health services (due to remote and or unable to pay), lack of education and knowledge is a constraint for communities and families to make the most of the health services available. This can also affect the nutritional status of children (10). Interventions related to hygiene and sanitation conditions may contribute to reducing the prevalence of stunting (UNICEF et al, 2010). Data from the World Bank Water Sanitation Program (WSP) in 2008 showed that high infant and under-five mortality rates, and malnutrition were strongly associated with water scarcity and sanitation scarcity. It had been demonstrated that hand washing with clean water and soap reduces the incidence of diarrhea by 42-47%. Thus, the clean water and sanitation program is undoubtedly very sensitive to reducing the risk of infection. The quality of the environment is mainly the availability of clean water, sanitation facilities, healthy living behaviors such as hand-washing with soap, toilet bowel movements, non-smoking, indoor air circulation etc (11). The data was consistent with the results obtained from this study where hygiene and environmental sanitation are associated with stunting events (OR = 1.64).

The prevalence of stunting in Brazil from 1996 to 2007 showed that two-thirds of the decline was related with the improvements in maternal education, family purchasing power, maternal and child health, and improved sanitation and water supply (12). An intervention program in Peru that included packages of nutrition, health, hygiene, and stimulation programs had reduced the stunting rate by 17.2%. Interventions included promotions of growth and development, prenatal supervision, exclusive breastfeeding, child feeding until age 2 years, monitoring the incidence of vitamin A and iron deficiency, to personal and family health . (13) Provision of high doses of vitamin A supplementation in children aged 6-48 months in Java, Indonesia showed an increase in height 0.16 cm every 4 months (14).

CONCLUSIONS AND RECOMMENDATIONS

Child care practice, hygiene aspects, and environmental sanitation as well as aspects of health care were significantly related to changes in nutritional status that initially normalized to stunting.

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