Development of Children Aged 3-5 Years Based on Nutritional Status in Banda Sakti District Lhokseumawe, Aceh

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Abstract: ***Preschool age (3-5 years) is a child's critical period of development. The development is influenced by various factors, including nutritional status. Methods of child development assessment with pre-screening questionnaire (Kuesioner Pra Skrining Perkembangan/KPSP) and assessment of nutritional status with anthropometry. This study aimed to identify difference of the mean value of KPSP score according to nutritional status based on anthropometry index of weight per height and height per age in preschooler aged 3 to 5 years at the Banda Sakti District Lhokseumawe. This study was observational analytic, sampling technique was done by cluster sampling, with cross sectional design, with total 112 respondents. There was a significant difference of mean value of KPSP score between nutritional status of each group based on index of weight per height and height per age. Result of Kruskal-Wallis test for weight per height was p = 0,034 and height per age was p = 0,023, with confidence interval 95% (α = 0,05).***

I. INTRODUCTION

Aceh Province is on rank seven of the highest prevalence of malnourished in Indonesia. Aceh Health official data on Lhokseumawe Regency (one of 23 regency in Aceh, located 270 km north of Banda Aceh) indicated 13 cases of severely wasted, also 75, 119 and 102 cases of wasted in 2014, 2015 and 2016 respectively. On other case, severely stunted was found 16 cases (2014), and 58 cases (2016), while stunted was counted as 100 cases in 2016. Lhokseumawe Regency itself has the highest cases of malnourished children under five in Banda Sakti District. Preschool children (age 3-5 yo) were among these numbers.

It is well known that nutritional status are correlated to child growth and development. Malnourished child growth failure predicts functional impairment in the child (delayed motor and mental development). There is no available data related to growth and development of malnourished preschool children in Banda Sakti district. This study is aimed to This study aimed to identify difference of the mean value of KPSP score according to nutritional status based on anthropometry index of weight per height and height per age in preschooler aged 3 to 5 years at the Banda Sakti District Lhokseumawe.

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II. METHODS

A. Design

This study was a cross sectional study. Inclusion criterias were child age between 3 to 5 yo, registered as pre-schooler students (play groups or kindergarden), parents approval on their children participation. Exclusion criterias were dehydrated child (mild to severe dehydration), using of oral corticosteroids more than 2 weeks, mental retardation, neuromuscular disease and blindness. All subjects parents were informed about the objectives and contents of the study, and verbal informed consents were obtained.

B. Samples

Proportional stratified random sampling was used in this study.

Samples were divided into play groups and kindergarden. Cluster sampling was used in location selection manually. From 999 preschool children in Banda Sakti Disrict, 112 of them were selected as samples from 5 kindergarden and 4 play groups.

C. Data Collection and Measurements

Data collection and measurement was performed from August 2017 to March 2018. Primary data was based on anthropometric measurement for nutritional status and pre-screening questionnaire (Kuesioner Pra Skrining Perkembangan/KPSP) for child growth and development. Anthropometric measurement used weight for height and height for age based on WHO Anthro software. Pre-screening questionnaire was classified as score of 6 to 10, while 6 was considered delayed, 7-8 as doubtful, and 9-10 as normal, and used for 36, 42, 48,54 and 60 months old.

D. Analysis

Subjects characteristics were presented as number and percentage; including age and sex. Bivariable analysis using Kruskal-Wallis test were done between each variables. p-

value less than 0.05 was considered to indicate statistical significance. Data were analyzed using statistical softwares.

III. RESULTS

Table 1 summarizes subject characteristics. Most of subjects were female (50.9%), aged 54 months were the highest numbers of subjects (37.5%).

Table 1 Characteristic of subjects

Characteristics	n (%)
Age	
36 months	12 (10,7)
42 months	15 (13,4)
48 months	31 (27,7)
54 months	42 (37,5)
60 months	12 (10,7)
Sex	
Male	55 (49.1)
Female	57 (50.9)

A. Weight for Height and Height for Age Nutritional Status

Table 2 summarizes weight for age nutritional status based on children ages and table 3 showed the number of finding of height for age nutritional status based on ages.

Table 2 Weight for Height Nutritional Status Based on Age

Age (Months)	Nutritional Status			
	Severely Wasted	Wasted	Normal	Obese
36	0 (0)	0 (0)	11 (91.7)	1 (8,3)
42	0 (0)	0 (0)	13 (86,7)	2 (13,3)
48	2 (6.5)	2 (6.5)	24 (77,4)	3 (9,7)
54	0 (0)	1 (2.4)	35 (83,3)	6 (14,3)
60	0 (0)	0 (0)	12 (100)	0 (0)

Table 3 Height for Age Nutritional Status Based on Age

Age (Months)	Nutritional Status			
	Severely Stunted	Stunted	Normal	Tall
36	0 (0%)	0 (0%)	12 (100%)	0 (0%)
42	0 (0%)	0 (0%)	14 (93,3%)	1 (6,7%)
48	0 (0%)	0 (0%)	28 (90,3%)	3 (9,7%)
54	0 (0%)	0 (0%)	38 (90,5%)	4 (9,5%)
60	0 (0%)	0 (0%)	12 (100%)	0 (0%)

B. KPSP Score and nutritional status

Table 4 to 6 showed KPSP Score based on ages, and KPSP score based on nutritional stastus for both weight for age and height for age.

Table 4 KPSP Score

Age (Months)	KPSP Score					Mean±
	6	7	8	9	10	
36	0 (0%)	0 (0%)	3 (25%)	9 (75%)	0 (0%)	8,75±0, 45
42	0 (0%)	0 (0%)	4 (26,7%)	11 (73,3%)	0 (0%)	8,73±0, 46
48	(3,2%)	2 (6,5%)	13 (41,9%)	15 (48,4%)	0 (0%)	8,35±0, 76
54	(7,1%)	3 (7,1%)	12 (28,6%)	23 (54,8%)	1 (2,4%)	8,38±0, 94
60	0 (0%)	0 (0%)	9 (75,0%)	2 (16,7%)	1 (8,3%)	8,33±0, 65
Total	4 (3,6%)	5 (4,5%)	41 (36,5%)	60 (53,6%)	2 (1,8%)	

Table 5 KPSP Score Based on Nutritional Status

Nutrition Status	KPSP Score					Mean±
	6	7	8	9	10	
Weight for Height						
Severely Wasted	1 (50%)	0 (0%)	1 (50%)	0 (0%)	0 (0%)	7,00±1, 41
Wasted	1 (33,3%)	1 (33,3%)	0 (0%)	1(33,3%)	0 (0%)	7,33±1, 53
Normal	1 (1,1%)	3 (3,2%)	35 (36,8%)	54 (56,8%)	2 (2,1%)	8,56±0, 65
Obese	1 (8,3%)	1 (8,3%)	5 (41,7%)	5 (41,7%)	0 (0%)	8,17±0, 94
Height for Age						
Severely Stunted	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Stunted	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Normal	4 (3,8%)	2 (1,9%)	38 (36,5%)	58 (55,8%)	2 (1,9%)	8,50±0, 75
Tall	0 (0%)	3 (37,5%)	3 (37,5%)	2 (25%)	0 (0%)	7,88±0, 84

IV. DISCUSSION

Cases of severely wasting and wasting in Banda Sakti Disrict were lower than provincial and national ones (4.5% compared to 15,7% and 12,1%) (1). Weight has linier relation with height. In normal situation, weight will grow as well as height, and used to determine acute malnutrition, probably affected by environment and disease. Temporary situation such as infection and appetite correlate to disease (2). In this study, we found cases of obesity as well, both situation namely double burden of nutrition.

No severely stunting and stunting found in this study. This probably happened due to sampling numbers and location of study. Unpresentated and undetected samples might have caused this. Thus, the location was in play group and kindergarden, which most students has better access to food and schedule eating hours. Not to mention parents were able to put their kids in schools, indicating well financial resources.

Score 9 was found in 56.8% (based on weight for height). Score 9 indicated the growth was appropriate for age. In this study, better nutritional status for weight for height showed better score of KPSP. Good growth and development test should have sensitivity and specifity higher than 70-80% in order not to cause overdetection or underdetection. In this study, KPSPS score has 40% of underdetection since children with suspected growth delay is not detected with KPSP (false negative) (3). In this study, we also found that the higher ages showed higher score of KPSP (10) in ages of 48, 54 and 60 months compared to none of score 10 of KPSP in 36 and 42 months old.

Regarding nutritional status and KPSP, statistical analysis showed that there was significant differences of KPSP score of each group of nutritional status based on weight for height and height for age. In this study, nutritional status has a positive relation to growth and development of children, meaning that better nutritional status showed better growth and development (4,5). One of factors to contribute to child development is stimulation. Play group and kindergarden provided such stimulation to child brain in motoric, language, psychosocial, emotion, characters, values and cognitive skills in order to reach optiml development according to their ages (6, 7).

V. CONCLUSION

Nutritional status of 3-5 yo children in Banda Sakti District based on weight for age and weight for age were dominantly in normal status. Score 9 was found in half of the children. There were significant difference of KPSP score of 3-5 yo children based on weight for height and height for age.

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