

MEASURING RELATIONSHIP OF CHILDREN NUTRITIONAL STATUS TOWARD COGNITIVE DEVELOPMENT IN ACEH

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ABSTRACT

Growth implies a change in body size, structure, and shape to be more related to physical changes. Growth can be interpreted as a quantitative change, as a result of external or environmental influences. Factors that influence the growth and development of early childhood are genetic or hereditary. Cognitive ability is a whole individual to take purposeful actions, think rationally, and deal with the environment effectively.

The purpose of this study was to determine the relationship between children's nutritional status and early childhood cognitive development in Banda Aceh Municipality, Aceh Province, Indonesia.

A cross sectional study was conducted by using quantitative research method, with a total sample of 62 children age 4 to 6 years old. This research was aimed to determine if there is relationship between children nutritional toward children cognitive development and if there was a correlation between these two factors. The data were collected by using a questionnaire disseminated with a google form before a treatment is conducted toward samples. This research took place in Banda Aceh Municipality, Aceh Province, Indonesia.

The results of this study illustrate that 53.20% early childhood children in Banda Aceh Municipality were in normal nutritional status based on Z-score. 24.20% of children is at fat level whereas 9.70% is at thin level and the rest is very thin at 6.50%. On the other hand, these children cognitive development showed that none are at good level and from 62 samples, there was 69.36% is at moderate category, and 30.64% is at poor category of cognitive development. From the calculation of P value of 0,204 with alfa score at 95%, it showed that there was a positive relationship between children nutritional status toward their cognitive development.

Keywords: Children's Nutritional Status, Cognitive Development, Early Childhood

INTRODUCTION

Children are an investment for the nation and state. The sustainability of the nation and the State depends on the quality of child development. As state assets, children must receive attention from when they are still in the womb until they become adults (Moonik, Lestari & Wilar, 2015). The problem that often occurs in children, especially in developing countries like Indonesia, is low nutritional status as indicated by the high number of children experiencing wasting (11.1%) and stunting (27.5%). This results in delays in growth and development and there are times when delays cannot be caught up anymore so that children do not grow and develop optimally (Riskseddas, 2018).

Wasting is the condition of a child whose body weight decreases over time until the total body weight is far below the standard growth curve or body weight based on low height (thin) and shows acute and severe weight loss.

There are several ways of determining a child's nutritional status, one of which is anthropometric determination. Anthropometric indices that are commonly used in determining the nutritional status of children are weight for age (weight/age), height for age (height/age), length for age (length/age), and weight for height (weight/ height).

Many reasons behind the growth and development delay that occurs in children. It is necessary to know exactly each cause because the incidence of delay also varies greatly between each child. For this reason, studies that focus on the causes of developmental delays need to be prioritized so that good and useful intervention plans can be found to optimize children's growth and development.

Cognitive is a thought process, which is the individual's ability to connect, assess, and consider an event or incident. The cognitive process is associated with the level of intelligence which marks a person with various interests especially addressed to learning ideas (Susanto, 2011). Cognitive development describes how a child's mind develops and functions. It is a process by which individuals can improve their ability to use their knowledge. Cognitive ability is a child's ability to think more complexly and to do reasoning and problem-solving, the development of this cognitive ability will make it easier for children to master broader general knowledge, so that they can function normally in everyday society. However, in their development, not all children can develop according to their stages, so it is necessary to do an analysis (Pitriani, 2021).

METHODOLOGY

Research Approach

The design of this study is cross-sectional with a quantitative approach to describe an existing phenomenon. A cross sectional study was conducted by using quantitative research method, with a total sample of 62 children age 4 to 6 years old. This research was aimed to determine if there is relationship between children nutritional toward children cognitive development and if there was a correlation between these two factors. The data were collected by using a questionnaire disseminated with a google form before a treatment is conducted toward samples.

Research sites

The research was conducted in Uleekareng sub district in Banda Aceh Municipality, Aceh province, Indonesia. This study was carried out at Taman Kanak-kanak Baitusshalihin located in Uleekareng subdistrict. This site was chosen because the school was a lab school for PAUD HI project in Banda Aceh.

Population and Sample

Total population of this research is 125 children. The sample was chosen based on a purposive sampling method with special criteria of children aged 4 to 6 years, who had no eating disorders and lives in Uleekareng sub district. If there are two (2) early childhood children in a family, then the oldest child will be selected as the sample.

Procedures

The procedure for this research was started by using pre-test, treatment, and post-test. Treatment was conducted by using the nutritional guidance book from Health Ministry of Indonesia about children health nutritional guidance. The test was measured with p value score at 0,05 and SPSS 22. Data included children height, weight and age.

Child data including age, sex, morbidity, weight, and height were analyzed using anthropometric measurements. Data on body weight and height are obtained directly. Weight was measured with an electronic scale. The scale was periodically calibrated. All subjects were weighed shoeless in light clothing only. Height was measured with a height scale measuring which is recommended by WHO.

Data on family characteristics including the size of the family, and parents including stimulation about cognition, age, education, and occupation, were collected through Google Forms based on the questionnaire. Data on nutritional and healthcare knowledge was collected from mothers. The nutrition and healthcare knowledge of the mother was measured by disseminating a questionnaire. A multiple-choice test of nutrition and healthcare knowledge was administered, while nutrition and healthcare were measured by a set of statements with multiple choice questions.

Data Analysis

All data from sample was verified and coded before data analysis was carried out with SPSS 22. Each answer on the questionnaire instrument was evaluated and scored using a Likert scale.

RESEARCH RESULT

Nutritional Status of Study Sample Children

In Table 1, the children in the sample had normal nutritional status, which was 53.20% based on the weight-for-height indicator. However, there were still 6.50% of the research samples with very thin nutritional status and 24.20% of the research samples with obese nutritional status.

Table 1. Distribution of Study Sample Children According to Nutritional Status

No	Nutritional Status	N	%
1	Very Thin	4	6,50
2	Thin	6	9,70
3	Normal	33	53,20
4	Obesity	15	24,20
	Total	62	100,00

Table 2 Distribution of Children's Levels of Cognitive Development

No	Category	Cognitive Development Level	
		n	%
1	Poor	19	30,64
2	Moderate	43	69,36
3	Good	0	0,00
	Total	62	100,00

On the other hand, Table 2 shows that the level of cognitive development is generally in the sufficient category. This can be seen that from total 62 samples, there were 69.39% of them are at moderate category. The test result of the children's cognitive examination showed that there were no cognitively good children.

During the research, there were other data found in accordance to the health guidance book. They are as follow:

Table 3. The Effect of Family Characteristics, Nutrition and Health Care on Children's Cognitive Development

Variables	Coefficient	r	R Quadrat	P value
Constanta	-.820	0,975	0,951	0,000
Mother's Age	.011			
Father's Age	.012			
Mother's Education	-.160			
Father's Education	.170			
Mather's Occupation	-.047			
Father's Occupation	.071			
Size of Family	-.077			
Mother's knowledge	.042			
Cognitive Stimulation	1.018			
Nutritional Status	-.012			
Morbidity	.001			

The results of the analysis conducted on table 3 showed that there is a very significant influence between family characteristics and nutrition and health care on children's cognitive development. This is indicated by a P value <0.05 and an R-value of 0.975 which means that family characteristics and nutrition and child health care affect children's cognitive development by 97.5%. The results of the regression test obtained by the line equation obtained in this model are as follows:

$$\text{Cognitive development} = -(0.820) + 0.011 (\text{mother's age}) + 0.012 (\text{father's age}) - 0.160 (\text{mother's education}) + 0.17 (\text{father's education}) - 0.014 (\text{mother's occupation}) + 0.071 (\text{father's occupation}) - 0.077 (\text{family size}) + 0.042 (\text{mother's knowledge about nutrition and health}) - 0.029 (\text{psychomotor stimulation}) + 1.018 (\text{cognitive stimulation}) - 0.012 (\text{nutritional status}) + 0.001 (\text{if healthy})$$

DISCUSSION

In this study, the factors studied which are suspected to be related to children's cognitive development included health and nutrition counseling to mothers, stimulation of cognitive and psychomotor development, children's nutritional status, and child morbidity levels. Table 2 above showed a very concerning information because there are almost a third of the children examined have less cognitive development level.

It is then becoming a question, if there are some causes this less cognitive development. The direct causes of malnutrition are nutritional imbalances in the food consumed and the spread of infectious diseases, and sanitation intervention on healthcare (Freeman, et.al, 2017). Indirect causes are food security in the family, parenting patterns, and health services. These three factors are related to the level of education, knowledge, and skills of the family and the level of family income. The maternal factor plays an important role in providing and serving nutritious food in the family, thus affecting the nutritional status of children (Pitriani, 2021).

The direct factors that affect nutritional status are the food consumed daily by humans and also the occurrence of infections in the body so that the body experiences continuous nutrient deficiencies. The indirect factor referred to is the availability of food provided by the family to ensure child nutrition. According to Fikawati (2017), the unbalanced food intake will result in a lack of energy and nutrients needed by the body to carry out its functions, while the incidence of infection will exacerbate nutritional problems. Lack of food availability, inadequate parenting patterns, clean water sanitation, and inadequate health services are factors contributing to nutritional problems. Family upbringing is the factor that most influences the two direct factors. Mothers/caregivers have an important role in providing food choices, and patterns of feeding children will also affect children's consumption. Lack of quality resources, limited information related to parenting, and low level of knowledge of education and community culture are the main problems found in the community. All of those can be seen below in the tables.

The results of the study divided children's cognitive development into 3 parts, namely the poor, Moderate, and good categories. Based on these findings, the level of children's cognitive development is divided into 2 parts, namely less category and moderate category and there are no children who have good cognitive development category. As for the results of the cognitive development of children who were poor category than a third of the study sample, namely 30.64%, and the remaining 69.36% had cognitive development in the moderate category (Table 2). This should receive serious attention from both parents and teachers in kindergarten.

The results of the analysis conducted there is a very significant influence between family characteristics and nutrition and health care on children's cognitive development. This is indicated by a P value <0.05 and an R-value of 0.975 which means that family characteristics and nutrition and child health care affect children's cognitive development by 97.5%.

CONCLUSION

The results of the study show that only about half (53%) of children have good nutritional status and the rest are children with malnutrition. Malnutrition in this child consists of under nutrition and excess nutrition, namely wasting about 16,2% and obesity by 24.2% (Table 1).

The results of the study divided children's cognitive development into 3 parts, namely the poor, adequate, and good categories. As for the results of the cognitive development of children who were less than a third of the study sample, namely 30.64%, and the remaining 69.36% had cognitive development in the sufficient category. This should receive serious attention from both parents and teachers in kindergarten.

The results of the correlation test between children's nutritional status and children's cognitive development using the SPSS statistical test explained that there was a positive relationship between the two factors. This was indicated by a P value <0.05 and an R-value of 0.975 which means that family characteristics as well as nutrition and children's health affect children's cognitive development by 97.5%. The better family characteristics will make the better children cognitive development. Thus, in order to increase children cognitive development, parents should not only focus on nutrition and health but also those family characteristics. Because children who grow and develop in an environment with good family characteristics will affect children's cognitive development which will ultimately affect children's learning achievement at school.

Because children who grow and develop in an environment with good family characteristics will affect children's cognitive development which will ultimately affect children's learning achievement at school.

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