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Relationship Between Stunting and Cognitive Development of Tkit Ruhul Jihad Cilandak South Jakarta Students

Vera Suzana Dewi Haris[1], Siti Rahmadani[2], Rosita Syaripah[3]

[1,2] Midwifery Study Program, Poltekkes Kemenkes Jakarta I, Indonesia
[3] Midwifery Study Program, Poltekkes Kemenkes Jakarta III, Indonesia

Abstract

According to the Ministry of Health (2018), the incidence of stunting in Indonesia has the highest prevalence compared to other nutritional problems such as undernutrition, thinness, and fatness. The prevalence of stunting has increased from 2016 (27.5%) to 29.6% in 2017. The purpose of this study was to determine the relationship between stunting and children's cognitive development. Research Methods: Observational quantitative research design is a cross-sectional method. The subject of this study was secondary data from TKIT Ruhul jihad Cilandak in the form of student development report documents consisting of age, height, and weight. The subjects in this study were student development report documents as many as 45 students with a simple randomization sampling method by the inclusion and exclusion criteria. A total of 22.2% of TKIT Ruhul Jihad students were stunted, and 88.9% of students had appropriate cognitive development, so from the results of the Fisher Exact test it was stated that there was no relationship between stunting and student cognitive development, based on Weight/Age it was known that three (6.7%) subjects had Weight/Age values less. Based on Height/Age, it is known that ten (22.2%) subjects have short Height/Age values. Based on Weight/Height, it is known that one (2.2%) subject has a Weight/Height value of less. This study concludes that there is no relationship between stunting and the cognitive development of TKIT Ruhul Jihad students in Cilandak, South Jakarta.

Keywords: Stunting, Cognitive Development, Intellectual

Corresponding Author: Rosita Syaripah
Email: rositasyarifah.saman@gmail.com

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1. Introduction

Stunting is one of the major nutritional problems in all countries. According to who (2016), (who. Int, 2016) in 2016 the country of paraguay ranked first for the lowest incidence of stunting, with a value of 5.6%. In 2015, the country of kuwait ranked first for the lowest stunting incidence value, which was 4.9%. The incidence of stunting in indonesia is based on data from the nutrition status monitoring (psg) for three years, with short stature having the highest prevalence compared to other nutritional problems such as undernutrition, thinness, and fatness. The prevalence of stunting increased from 27.5% in 2016 to 29.6% in 2017. (Indonesian Ministry of Health, 2018). According to the diy provincial health office in 2019, Yogyakarta city ranks third in the incidence of stunting out of five districts with a prevalence value of 12.82%. Stunting occurs as a result of the pregnancy process of mothers who experience malnutrition during pregnancy, low early breastfeeding initiation (imd), and inadequate complementary feeding (mp-asi) (Ministry of Health, 2018). Stunting has short-term and long-term impacts on children. Short-term impacts include suboptimal cognitive, motor, and verbal development, and the most severe is death. The long-term impact is suboptimal posture as an adult, increased risk of obesity, decreased reproductive health, and less than optimal work productivity (Kemenkes, 2018).

Diagnosis of stunting is done by applying anthropometry. Cognitive is a pattern of changes in mental abilities that include learning, concentration, thinking, creativity, and language. (Khadijah, 2016). According to Aryastami (2017), stunting has an impact on reducing children's intelligence and cognitive abilities. According to Solihin (2013), the height of toddlers according to age is positively associated with the level of cognitive development (p =.02). (Dwi et al., 2013; Yadika et al, 2019) there has been no research on the relationship between stunting and cognitive abilities in kindergarten children. Therefore, researchers are interested in discussing the relationship between stunting and cognitive abilities at ruhul jihad kindergarten in Cilandak, South Jakarta.

2. Research Method

This type of research is observational quantitative research. The type of data in this study is secondary data obtained from existing documents at Ruhul Jihad. This research design is cross-sectional. Data collection of independent variables in this design research

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depends on the subject under study which is carried out at one time. (Sugiyono, 2016) This research lasted for one month, from April 20 to May 28. Data were taken from the developmental documents of Ruhul Jihad Cilandak Kindergarten students which contained cognitive development, age, height, and weight. Using Simple Randomization.

3. Results and Discussions

a. Result

Table 1.
Characteristics of Research Subjects

Characteristics	Frequency/ Value	Percentage
Gender		
Male	25	55.6%
Female	20	44.4%
Age (years)		
Average	4.87	
SD	0.344	
Minimum and maximum	4 and 5	
Body Weight (kg)		
Average	18.287	
Minimum and maximum	12.7 and 32.1	
Height (cm)		
Average	107.291	
Minimum and maximum	95 and 119.5	
Stunting		
Yes	10	22.2%
No	35	77.8%
Cognitive Development	40	88.9%
As per		
Not suitable	5	11.1%

The study subjects were dominated by males with a number 1.25 times greater than females. Six (13%) male subjects and four (9%) female subjects were stunted. Male subjects were 1.5 times more than female subjects. Research subjects who experienced stunting were dominated by 5-year-old children, namely nine (90%)

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people while the sample of 4-year-old children who experienced stunting was only one person with a percentage of 10%.

Table 2.
Overview of Height/Age classification of TKIT Ruhul Jihad Cilandak students

Classification	Frequency/Value	Percentage
High	0	0%
Normal	35	77.8%
Short	10	22.2%
Very short	0	0%

Table 3.
Overview of Weight/Age Classification of TKIT Ruhul Jihad Cilandak students

Classification	Frequency/Value	Percentage
Risk of overweight	9	20%
Normal weight	33	73.3%
Underweight	3	6.7%
Severely underweight	0	0%

Based on the results of the study, a picture of Height/Age nutritional status was obtained. As seen in the table above. Most of the subjects had normal nutritional status. This is because The Height/Age and Weight/Age values are normal. A total of three (6.7%) subjects had a Weight/Age value of less. These three subjects when viewed from the parameters of Height/Age and Weight/HeighT are in the short and well-nourished category. This indicates that the three subjects experienced chronic nutritional problems (short) and did not experience acute nutritional problems (normal Weight/Height).

Table 4.
Overview of Weight/Height Classification of TKIT Ruhul Jihad Cilandak students

Classification	Frequency/Value	Percentage
Obesity	2	4.4%
More nutrition	3	11.1%
At risk of overnutrition	7	15.6%
Good nutrition	32	71.1%

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Undernourished	1	2.2%
Poor nutrition	0	0%

Based on the results of research conducted at TKIT Ruhul Jihad Cilandak, a description of the nutritional status of Weight/ Height can be seen in the table above, it can be seen that most (71.1%) subjects have good nutritional status. One subject had a poor nutritional status based on Weight/Height. If confirmed with Weight/Age and Height/Age data, the subject is in the category in accordance with the growth of children his age. This indicates that the subject was experiencing acute nutritional problems due to the low Weight/Height value.

Fisher's Exact Test Analysis

The statistical test formula for analyzing the relationship between stunting and cognitive development is the chi-square test the research subjects analyzed were 45 samples. The data taken is data that has been done simple randomization. Data analysis of the relationship between stunting and cognitive development.

Table 5.
***Fisher's exact* test of the association of *stunting* with cognitive development**

	Value	df	*Asymptotic Significance (2- sided)*	*Exact Sig. (2-Side*	*Exact Sig. (1-side)*
Pearson Chi-Square	1.607[a]	1	.205		
Continuity correction[b]	.486	1	.486		
Likelihood Ratio	2.687	1	.101		
Fisher's Exact Test				.571	.266
Linear-by-Linear Association	1.571	1	.210		
N of Valid Cases	45				

The conditions for using the chi-square test are: 1) sample size N>30; 2) all cells do not have a value of 0; 3) for 2x2 tables, the expected count value must be 0, while

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for tables more than 2x2, the expected count value must be <20% (Dahlan, 2014). In the data from the chi-square test with a 2x2 table, it was found that the expected count value was 50%, which means that it did not meet the requirements for using the chi-square test, so that in accordance with the rules for selecting hypothesis tests, the derivative test, namely the Fisher's exact test, was used. In the Fisher's exact test, the p value = 0.571 was obtained, which means p > 0.05. This shows that the value of the relationship between stunting and cognitive development does not have a meaningful relationship.

4. Conclusion

Fisher's exact test analysis in this study showed that there was no significant relationship between stunting and cognitive development of TKIT Ruhul Jihad Cilandak students with a P > 0.05 value. The results of this study are in accordance with research conducted by Muchlis et al. (2015), who examined the relationship between nutritional status and learning achievement as a parameter of cognitive development with a value of p = 0.771. Muchlis et al. (2015) conducted a bivariate chi-square test analysis between nutritional status data and learning achievement data. The results of this study have different results from the research of Legi (2012). The research conducted by Legi was descriptive with a cross-sectional design. Legi did not explain what instruments were used, but Legi used student report card data as a reference for students' cognitive development presented in the form of grades. His research has chi-square test results p = 0.00 and CI = 95%, which means that there is a meaningful relationship between nutritional status and learning achievement. The results of the research conducted by Legi could get significant results because the research did not specify the operational definition of nutritional status. Legi examined the overall nutritional status of the subjects (not specifically height/age), causing the emergence of confounding factors, namely weight/age and weight/height nutritional status. This is because the subjects studied by Legi were elementary school students aged 8 to 11 years. (Legi N N, 2012). In addition, according to Syah (2007), learning achievement is influenced by three factors, namely internal, external, and learning approach factors. Internal factors consist of intelligence, attitude, talent and interest, and learning motivation. External factors consist of society, family, and friends. Based on the

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theory put forward by Syah, learning achievement is influenced by these three factors, where each region has different conditions, thus affecting the results of research conducted by Legi. (Guyatt H., 2018; Ibrahim & Faramita, n.d.; Legi N N, 2012).

The results of this study are also different from the results of research conducted by Solihin (2013), who examined the relationship between nutritional status, cognitive development, and motor development in preschool children. The research conducted by Solihin was a survey type of research with a cross-sectional design. Solihin measured cognitive development using tools in the form of educational game tools designed in accordance with the aspects to be measured, namely aspects of the use of symbols, aspects of understanding identity, aspects of understanding causes, aspects of understanding numbers, and aspects of understanding concepts. This measurement is based on the curriculum center of the national education department in 2007. (Ministry of Education and Culture, 2013) In his research, the results of the bivariate chi-square test showed a significant relationship between cognitive development and nutritional status ($p = 0.020$). The results of the research conducted by Solihin could get significant results because most of the subjects studied did not attend PAUD, namely, as many as 65 subjects did not attend PAUD from a total of 73 subjects. The results of Solihin's research also found that the length of attending PAUD ($p = 0.001$) and gross motor development ($p = 0.000$) had a significant relationship, so Solihin concluded that the factors that influence cognitive development are the length of attending PAUD and gross motor development of children. Based on the results of Solihin's research, the factor of length of attending PAUD supports the results of the current study because this study was conducted on children who have attended PAUD for two years. (Dwi et al., 2013; Syefors et al., 2019).

Based on the explanation put forward by Solihin (2013) (Dwi et al., 2013). The length of time attending PAUD is one of the causes of the difference in the results of research conducted by Solihin and Legi with the current study, so this means that toddlers who have taken PAUD for a certain period of time can significantly improve cognitive development. Another reason that the results of the current study have insignificant results is that all data on children with stunting nutritional status have cognitive development that is appropriate for their age. In addition, the last three months from March to the end of

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June, all students have undergone a home learning system so that teachers have difficulty monitoring and assessing children's cognitive development, causing possible bias in giving assessments. The confounding variables in this study were genetics, level of parental knowledge, history of illness suffered during pregnancy, and history of childhood illness at the age of 0-24 months. (Ibrahim & Faramita, n.d) This study did not obtain data on parental height that could be used as a genetic description of the subject, and researchers also had difficulty obtaining data on the history of diseases suffered by the subject's mother during pregnancy and the subject's disease history when he was 0–24 months old. This is because researchers cannot take direct measurements and interviews with the subject's parents. This study also did not obtain data on maternal education history and maternal nutrition and stunting knowledge. Based on research conducted by Ibrahim & Faramita (2015), there is a significant relationship between the mother's education level (p = 0.020) and knowledge of nutrition & stunting in mothers (p = 0.000) with the incidence of stunting in children aged 24-59 months in the Barombong Health Center working area. Ibrahim and Faramita also found that there was no relationship between father's education (p = 0.150), mother's occupation (p = 0.513), parents' income (p = 0.599), and the number of family members (p = 0.178) with the incidence of stunting of children aged 24-59 months in the Barombong Health Center work area. This is a reference that economic status described by parental income does not have a significant relationship with the incidence of stunting in children aged 24-59 months. (Ibrahim & Faramita, n.d.)

5. Compliance with ethical standards

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Disclosure of conflict of interest

This research collaboration is a positive thing for all researchers so that conflicts, problems and others are absolutely no problem for all writers.

Statement of informed consent

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Every action we take as authors is a mutual agreement or consent.

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