



The Assosiation Between Nutritional Status and Fine Motor Development in Children Aged 36-42 Months

^kFitria Edni Wari¹, Farida Yuliani², Erfiani Mail³

^{1, 2, 3}Program Studi S1 Pendidikan Profesi Bidan STIKes Majapahit

Author Corespondence Email (^k): v3dni1206@gmail.com

ABSTRACT

Motor development is related to nutritional status, optimal nutrition affects the physical growth of cell proliferation. Malnutrition will affect the development of children where the proportion of body structure becomes inappropriate for their age and interferes with the development of other aspects, one of which is fine motor development. This study used an analytical survey research design with a cross sectional approach with the aim of knowing the relationship between nutritional status and fine motor development. The population and sample in this study were 36-42 months old children in PAUD Tarbiyatush Shibyan, Gayaman Village, Mojoanyar District, amounting to 36 children with a total sampling technique. This study uses a weight scale instrument to measure body weight in determining the nutritional status of children with the criteria of Weight based on Age and KPSP (Kuesioner Pra Skrining Perkembangan) observation sheet to measure children's fine motor development. Data analysis with univariate analysis and bivariate analysis on two variables that are suspected to be correlated. Chi Square test was performed. Chi Square test results obtained p Value = 0.004 < 0.05 which indicates that there is a relationship between nutritional status and fine motor development in PAUD Tarbiyatush Shibyan, Gayaman Village, Mojoanyar District. Midwife coordinates with the teaching staff/teachers in the school to monitor progress and continuous stimulation.

Keywords: Fine Motor Development, Nutritional Status

Article history :

Received: 9 Februari 2022

Received in revised form: 14 Maret 2022

Accepted: 23 April 2022

Available online: 1 Juni 2022



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INTRODUCTION

Growth and development is a continuous process that occurs from conception to adulthood. The main stage in the formation of physical and mental abilities that occurs in childhood because this period is a critical period in growth and development. During this stage, physical growth and brain development which is very important for intelligence, motor development, speech and language, as well as social and independence take place quickly ¹.

Poverty puts approximately 250 million children under the age of 5 in low/middle income countries at risk for developmental disorders, malnutrition and inadequate stimulation. This causes physical and psychosocial health problems that persist into childhood ². Preschool age is an important period for children's growth and development to prepare themselves to enter the next stage but about a third of the 30 million children aged 0-6 years in Indonesia have difficulty accessing Early Childhood Education (PAUD) programs. The Indonesian Ministry of Health reports that 400,000 (16%) Indonesian children under 5 years of age have growth and development disorders. A good and effective screening method is carried out to prevent over-detection or under-detection so that developmental disorders in children under 5 years can be detected early ¹.

Motor skills are also associated with nutritional status experienced by children aged 3-5 years. Optimal nutrition will have an impact on the physical growth of cell proliferation, increase in weight and height of children which if experiencing malnutrition will affect the development of children including the proportion of body structure that is not in accordance with their age and interfere with the development of other aspects ³. Nutritional status also affects the development of a child's brain, if the brain experiences a developmental disorder, it will disrupt the organic matter in the brain and will cause several things, such as a lack of stimulation from the central nervous system to the motor nerves that coordinate with each other with the muscles so that it has an impact on gross and fine motor development ⁴. Good, directed, and regular stimulation from parents which includes stimulation of gross motor skills, fine motor skills, language and social skills will be able to assess the quality of children's development. Children's abilities can be assessed gradually by taking regular measurements at the preschool age stage. One aspect of child development that needs to be considered is motor skills. Motor skills can help children to explore the surrounding environment through physical movement, also relates to interpersonal relationships with other people for example in games, also develops socio-emotional aspects through feeling happy when playing game activities with other people ⁵.

Preliminary study conducted by researchers at PAUD Tarbiyatush Shibyan Gayaman Village, Mojoanyar sub-district, based on initial observations, from 10 children there were 5 children of the same age but different body size (weight), 2 children looked normal and 3 children looked thin. In the initial observations, it was also found that when they did some tasks from the teacher such as writing and drawing, it was found that some children could not finish on time, and there were even some children who could not do the assigned tasks. These children mostly have a smaller body size than other children. According to direct interviews conducted by researchers with several guardians of PAUD Tarbiyatush

Shibyan, Gayaman Village, Mojoanyar sub-district, information was obtained that they never did stimulation at home because they did not understand how to do independent stimulation, some parents said they did not have enough time with their children because they were busy working so do not know the stage of development of the child. From the results of interviews with the teacher council, it was found that the school had routinely carried out measurements of weight and height every 3 months but for developmental measurements it had not been carried out routinely so that developmental assessments had not been seen.

Based on the results of the preliminary study, researchers are interested in examining whether there is a relationship between nutritional status and fine motor development in children aged 36-42 months at PAUD Tarbiyatush Shibyan, Gayaman Village, Mojoanyar District.

METHOD

This research is an analytical survey research with a cross sectional approach. The population and sample are 36-42 months old children in PAUD Tarbiyatush Shibyan, Gayaman Village, Mojoanyar sub-district, totaling 36 children. The sample in this study was taken by total sampling technique. The instruments used are weight scales to determine the nutritional status of children with criteria for weight based on age (W/U) and KPSP observation sheets to measure fine motor development. The data is processed manually to determine nutritional status and then adjust the child's development and then analyzed using a statistical processing program. After it is processed, editing, coding and entering are carried out. Data analysis in this research is univariate analysis which aims to describe or get a picture of each variable to be measured and presented. Bivariate analysis is an analysis conducted on two variables that are suspected or correlated. Chi Square test was performed.

RESULTS

General data

Table 1. Frequency Distribution of Respondents by Gender

Gender	Frekuensi (n)	Persentase (%)
Male	20	55,56
Female	16	44,44
Total	36	100

Based on table 1, most of the respondents were male, namely 20 children (55.56%).

Table 2. Frequency Distribution by Age of Pre-School Children

Age	Frekuensi (n)	Persentase (%)
36 Month	15	41,67
42 Month	21	58,33
Total	36	100

Based on the age of the respondents, most of the respondents were 42 months old, namely 21 children (58.33 %).

Table 3. Distribution of Respondents Frequency Based on Mother's Education Level

Education	Frekuensi (n)	Persentase (%)
Junior High School	9	25,00
Senior High School	21	58,33
University	6	16,67
Total	36	100

Based on table 3, most of the respondents' mothers education level was high school education, namely 21 mothers (58.33%).

Special Data

Table 4. Distribution of Respondents Frequency Based on Nutritional Status of Children aged 36-42 Months

Nutritional status	Frekuensi (n)	Persentase (%)
Good Nutrition	21	58,3
Nutritional Less	15	41,7
Malnutrition	0	0
Jumlah	36	100

Based on table 4, most of the respondents have good nutritional status, namely 21 respondents (58.3%).

Table 5. Frequency Distribution of fine motor development of preschool children

Fine Motor Development	Frekuensi (n)	Persentase (%)
Appropriate	24	66,7
Not Appropriate	12	33,3
Jumlah	36	100

Based on table 5, most of the respondents had Appropriate fine motor development, namely 24 respondents (66.7%).

Table 6. Cross Table of the Effect of Nutritional Status on Fine Motor Development in Pre-School Children

Nutritional status	Fine Motor Development				Total	
	Appropriate		Not Appropriate		F	%
	F	%	F	%		
Good Nutrition	18	50,0	3	8,3	21	58,3
Nutritional Less	6	16,7	9	25,0	15	41,7
Total	24	66,7	12	33,3	36	100
Chi Square test results p Value = 0.004 < 0.05						

DISCUSSION

Nutritional status

Most of the respondents had good nutritional status based on weight and age. Children with good nutrition will look agile, active, and always eager to participate in various activities that affect children's motor development. Likewise, poor nutritional status in children can result in children's motor development not being optimal ⁶. Malnutrition is one of the causes of impaired motor development of children, in poor countries malnutrition is one of the causes of stunted growth and development in children ⁷. Nutritional status plays an important role in the growth and development of children, especially in the 1000 days of life, optimal growth of nerve cells and muscle cells is an important factor for children to form coordination of fine motor development ⁸.

The results of this study are most of the children with good nutritional status, this is possible because at school every day requires children to bring food supplies with a balanced menu to be eaten together during recess, there is a cooking class theme every week which is carried out in rotation which makes children excited to learn cook and eat the healthy menu. Through eating together, children are taught proper eating procedures as well as the behavior to choose healthy and nutritious food for their growth. Children can also imitate the eating habits of their good friends, because at this time children are still very happy to imitate. Good cooperation between teachers and parents is needed to choose and provide good food intake for their students as well as foster and supervise children's health.

Fine Motor Development

In this study, some of the respondents' fine motor development was appropriate. According to the researchers, this could be due to the health care factor of parents. Mother is an important figure in the first five years of child development, communication that exists between mother and child from the time they are in the womb becomes an important role in child development ⁹. Mothers with advanced education equivalent to high school have cognitive in the realm of knowledge structure that is more complex than individuals in primary education (SD and SMP), directly proportional to the cognitive

abilities of mothers' ability to capture information and process it into knowledge that can be applied concretely¹⁰.

Mothers who receive information about child development by health workers are able to process information into a more adaptive knowledge to provide care for their children. Housewives who take care of children for 7 to 24 hours per day give mothers time with optimal quality and quantity in providing a stimulus to increase child development¹¹.

Nutritional Status With Fine Motor Development

Motor development is influenced by nutrition, health status, and stimulation carried out according to the period of development. Therefore, anatomically there will be developments in individual body structures that change proportionally with increasing age. Poor nutritional status can hinder the development of children so that the proportion of the child's body structure is not in accordance with his age which will have an effect on other aspects of development⁶. The intake of nutrients consumed by toddlers will affect the nutritional status of toddlers. Differences in the nutritional status of toddlers have a different influence on each child's development, where if the intake of nutrients is not met properly then the development of toddlers will be hampered. Toddlers who are malnourished will cause growth disorders, are susceptible to infection, skin inflammation and ultimately can inhibit child development including cognitive, motor, language and skill development compared to toddlers who have good nutritional status¹².

Motor development reflects increased brain maturation which regulates the development of the nervous system and muscles (neuromuscular) which allows children to be more agile and active. Motor skills arise when the brain, nervous system, and muscles work together to produce movement. Although it is undeniable that the onset of motor behavior reflects the maturity of cognitive, sensory and motor system functions. As the corticospinal system matures, adaptive motor behavior begins to be expressed. The development of motor control depends on the establishment of specific connections between corticospinal axons and motor circuits in the contralateral spinal cord¹³.

Fine motor skills, gross motor skills, language and social interaction are developmental stages that are measured in children, normally these developmental stages go together and support each other with a developmental pattern that has characteristics at each stage of developmental age influenced by morphological, physiological, and psychological characteristics. Neuromuscular¹¹.

Among the four sectors of child development, fine motor development is a factor that supports children's readiness to enter the next stage of development in the school environment, fine motor skills have a direct effect on children's readiness to learn mathematics and the process of learning languages other than the language used daily¹⁴.

Preschool age children are the age of preparation for the task of growth and development at school age, at school age children's ability to balance fine motor skills involving small muscles of the body becomes an important part in dealing with the role of growth and development during school. The

function of writing, wearing clothes, eating and drinking, folding paper is very important to explore children's abilities through their developmental tasks at school age¹⁵.

Fine motor development is strongly influenced by the brain. The brain regulates every movement the child makes. The more mature the development of the nervous system of the brain that regulates muscles allows the development of children's motor skills. In order for the brain to develop optimally, adequate intake of energy, iron, copper zinc, LC-PUFAs and choline is required. Other factors, which can accelerate the development of fine motor skills in children, namely, the development of the nervous system, physical abilities that allow for movement, the presence of stimulation and prematurity. Because motor development is influenced by many factors, parents play an important role in the process of developing children's fine motor skills. Children's fine motor intelligence varies in terms of strength and accuracy. This difference is also influenced by the nature of the child and the stimulation he gets. The environment (parents) has a greater influence on children's fine motor intelligence. The environment can increase or decrease the level of intelligence of children, especially in the first days of life. Every child needs to be able to reach the stage of optimal fine motor development with the support of getting optimal nutritional intake and stimulation of child development regularly and appropriately. In each phase, children need stimulation to develop their mental and fine motor skills¹⁶.

CONCLUSIONS

There is a relationship between nutritional status and fine motor development of children aged 36-42 months at PAUD Tarbiyatush Shibyan Gayaman Village, Mojoanyar District. Midwife can coordinate with the teaching staff/teachers in the school to monitor developments and continuous stimulation. Midwives need to provide simple training to teaching teachers regarding how to stimulate in schools so that progress monitoring can be known and monitored properly.

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