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The Influence of Eye-Hand Coordination, Nutritional Status and the Object Control Ability of Early Childhood

Widia Oktri Haningsih^{1✉}, Nurul Ihsan², Gusril³, Ridho Bahtra⁴, Heru Andika⁵

PFaculty of Sports Science, Universitas Negeri Padang. Padang, Indonesia¹²³⁴⁵

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Abstract

This research aims to see and reveal the relationship between hand eye coordination and nutritional status on children's motor skills. The method used in this research is a quantitative method using an ex-post facto design. The sample in this study consisted of 30 children consisting of 15 boys and 15 girls who were still in kindergarten aged 5-6 years. The data analysis technique used is path analysis. The results obtained in this study show that there is an influence between eye-hand coordination and object control abilities in kindergarten children and there is an influence of nutritional status on object control abilities of children in kindergarten. From the results of the research, there is an influence between hand word coordination and nutritional status on control objects in children who are still in kindergarten (TK).

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✉ Correspondence address :
E-mail: widiaoh31@gmail.com

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INTRODUCTION

Early childhood education basically includes all efforts and actions carried out by educators and parents in the process of caring, nurturing and educating children by creating an environment where children can explore experiences that provide opportunities for them to know and understand the learning experiences they get from the environment, through a way of observing, imitating and experimenting that takes place repeatedly and involves all the child's potential and intelligence. Basic movement skills themselves are the foundation for other skills, which consist of locomotor control and object control. Children's basic movement skills grow in the early years of childhood and continue to develop until the end of childhood. These basic movement skills play an important role. almost every aspect of daily life (Gandotra et al., 2020; O'Hagan et al., 2022). Basic movements need to be taught to children three to six years old. At this age, different types of movement patterns need to be given (Chen et al., 2022) because basic movements do not develop naturally, therefore basic movements must be taught and given assignments that are appropriate to the child's developmental status (Lawson et al., 2021; Wang et al., 2020)

There are many factors influencing children's basic motor skills such as environmental factors, biological and economic factors which are seen only 34% of children show object mastery skills (Eather et al., 2018), and it is seen in the latest research that 460 children in Australia object control is more related to moderate to heavy activities in compare locomotor movements (Nathan et al., 2017), even though basic movement skills in the preschool years are the optimal time to be introduced and developed (Hardy et al., 2010)

This element of eye-hand coordination develops rapidly at ages 4 to 6 years. The need for nutritional status is also very influential because rapid growth and development occurs in the early age group. Providing balanced nutrition during this period is carried out to support optimal development (Judith et al., 2015), developing basic motor skills is very necessary so that children can develop well, such as paying attention to children's nutrition and providing children with activities to carry out hand eye coordination by throwing, catching and grasping objects (Niechwiej-Szwedo et al., 2021; Wicks et al., 2015), although children use the wall throw and catch test, this particular test was chosen because it is directly related to sport and its objectivity and reliability as well as

the relationship between physical activity and obesity (Wicks et al., 2015).

By conducting this research to see whether there is an influence of eye-hand coordination and nutritional status on the object control abilities of early childhood, so researchers are interested in looking at object control skills.

METHODS

This research is a design and structure that is designed in such a way as to answer existing questions, this research is in the form of ex-post facto which is a study of cause and effect relationships using a path analysis approach.

The participants used as samples in this study were children aged 5-6 years or in the preschool period consisting of 3 schools with a total of 30 participants consisting of 15 boys and 15 girls.

The method of this research is to measure nutritional status using the Body Mass Index (BMI) instrument, such as carrying out Height (TB) and Body Weight (BB) tests. Meanwhile, for hand eye coordination, use a tennis ball which is thrown against a wall and caught again without falling. For children's motor skills, they are measured using instruments (Anton, 2019).

RESULTS AND DISCUSSION

Based on the results obtained from 30 samples, the following results were obtained in **Table 1**.

Table 1. Frequency Distribution Data of North Padang Kindergarten Control Objects

Interval Class	Interval Class		Categories
	Percent Absolut	Percent	
9,1-10	14	43%	Very Good
8,1-9	2	7%	Good
7,1-8	6	20%	Enough
6,1-7	8	27%	Less
5,1-6	1	3%	Less Than Once

Table 1. Shows data on the ability of the control object. It can be seen that out of 30 students at North Padang Kindergarten, there is 1 student who is in the 5-6 interval class with the "Very Poor" category. In classification 6-7 there are 8 students or 27% of North Padang Kindergarten in the "Poor" category. In the 7-8 interval class there are 6 students or 20% of North Pa-

dang Kindergarten in the "Enough" category. In the 8-9 interval class there were 2 North Padang Kindergarten students in the "Good" category. Furthermore, in the 9-10 interval class there were 13 North Padang Kindergarten students in the "Very Good" category.

Table 2. Frequency Distribution of Hand Eye Coordination Data for North Padang Kindergarten Students

Interval Class	Interval Class		Categories
	Percent Absolut	Percent	
3,3-4	17	57%	Very Good
2,5-3,2	6	20%	Good
1,7-2,4	5	17%	Enough
0,9-1,6	0	0%	Less
0-,0,8	2	7%	Less Than Once

Table 2. Shows the results of the hand eye coordination data above. It can be seen that out of 30 students at North Padang Kindergarten there are 2 people or 7% of students who are in the 0-0.8 classification with the "Very Poor" category classification. In the 0.9 – 1.6 classification, there is not a single student in North Padang Kindergarten in the "Poor" category. In the interval class 1.7 – 2.4 there are 5 students or 17% of North Padaang Kindergarten in the "Enough" category. In the interval class 2.5 – 3.2 there are 6 students or 20% of North Padang Kindergarten in the "Good" category. Furthermore, in the interval class 3.3 – 4 there were 17 students or 57% of North Padang Kindergarten in the "Very Good" category.

Table 3. Frequency Distribution of Nutritional Status Data for North Padang Kindergarten Students

Interval Class	Interval Class		Categories
	Percent Absolut	Percent	
<-3 SD	28	93,3%	Very Skinny
-3 SD - 2 SD	2	6,7%	Thin
-2 SD - 1 SD	0	0%	Usual
>1 SD - 2 SD	0	0%	Fat
>2 SD	0	0%	Very Fat

Table 3. Shows the results of the BMI data above. It can be seen that of the 30 students at North Padang Kindergarten, not a single student was classified as SD > 2 in the "Very Fat" category, > 1 SD - 2 SD in the "Fat" category and -2

SD - 1 SD with the "Normal" category. In the SD -3 - SD -2 classification there are 2 students or 6.7% in North Padang Kindergarten in the "Skinny" category. In the <-3 elementary school interval class there were 28 students or 93.3% in North Padaang Kindergarten in the "Very Thin" category. The frequency distribution of nutritional status data results for North Padang Kindergarten can be seen in the table below.

In research that has been carried out, it can be seen that hand eye coordination has a significant influence on children's object control abilities and nutritional status has an influence on object control abilities in early childhood. From this research it can be said that coordination and nutritional status have an influence on object control skills. children, if the child does not have experience of eye-hand coordination then the child will lack mastery of control objects. As stated in previous research, there is no difference in the basic movement skills of boys and girls, but after adolescence, girls' mastery of basic movements decreases compared to boys (Jang & Hong, 2022).

Coordination is a person's ability to conduct motions or physical activities effectively and efficiently, demonstrating how a movement might occur. Hand-eye coordination is the coordinated control of eye movements with hand movements, as well as the processing of visual information, to achieve a person's ability to coordinate the eyes and hands into a complete, thorough, and continuous series of movements precisely in a controlled rhythm of motion that elicits a feedback reaction. Coordination between eyes and hands is simply the use of synchronized visual and hand motions to complete tasks (Ibrohim et al., 2022)

According to research, there is a direct effect of eye-hand coordination on the capacity of North Padang Kindergarten pupils to manage objects by 19.5%. The remainder is influenced by various variables. The coordination possessed by the sense of sight with the limbs, specifically the hands working together to carry out an action such as catching, throwing, kicking, bouncing the ball, and rolling the ball, is the meaning of the direct impact of hand eye coordination on control objects. It will be difficult to sense the capacity of the control object to be carried out correctly if there is no synchronization between the eyes and hands.

Nutritional Status is a variable that expresses one or more elements of an individual's nutrition (Shehzad et al., 2022). (Nisetee et al., 2020) defines nutritional status as the condition of the body that results from the balance of nut-

rients that enter the body and their usage. Nutritional status is the embodiment of nutrition in the form of a variable or the manifestation of a state of equilibrium in the form of a variable (Freerks et al., 2019; Primasari et al., 2018). Kesehatan seseorang mungkin menunjukkan kualitas hidupnya. Masalah kesehatan dapat muncul pada semua usia, namun balita lebih rentan karena sistem kekebalan tubuh mereka masih berkembang. Kesulitan gizi, baik gizi kurus maupun gizi gemuk merupakan permasalahan kesehatan yang umum terjadi di dunia (Tesfaye, 2022). Mengartikan status gizi sebagai keadaan tubuh sebagai fungsi konsumsi makanan dan penggunaan zat gizi (Niseteo et al., 2020).

The findings of study done by researchers demonstrate that nutritional state has a direct relationship on the capacity of North Padang Kindergarten pupils to handle things. The nutritional health of North Padang Kindergarten pupils influences their capacity to manage objects by 21.9%. The remainder is influenced by various variables. The meaning of the direct influence of nutritional status on the ability of the control object, with good nutritional status, kindergarten students' ability of the control object will also be good, so that kindergarten students can carry out activities without excessive fatigue to gain various movement experiences.

CONCLUSION

From the results of research carried out in this study, it can be seen that children aged 5-6 years or who are still in kindergarten for hand eye coordination skills have an influence on object control skills, and nutritional status also has an influence on object control skills, from the results of this research, researchers can say that for children's object control skills it is better to provide learning at an early age because young children will get more control over children's learning and nutrition at an early age because this greatly influences object control skills the child himself.

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