

Relationship of Physical Activity with Fine Motor Skills in 3-4 Years Old Children

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ABSTRACT

Introduction: *The creative potential of children will develop best through systematic physical activity and adapted to the age group of growth and development. If the child's fine motor skills are often stimulated, then he will grow well and be able to do physical activities well, and if the child can do physical activities well it will affect his fine motor development.*

The purpose : *to see whether there was a relationship between physical exercise and fine motor skills in PAUD children.*

Method : *used is quantitative with a correlational approach. The instruments used are physical activity questionnaires and DDST. The data analyzed using the Kendall test.*

The results : *obtained p-value 0.000 <0.05, which means that there is a relevant relationship between the two variables, namely physical activity and fine motor skills in PAUD children.*

The conclusion *Physical Activity is very influential in the development of children's fine motor skills.*

INTRODUCTION

Early childhood can be said as someone who is at the stage of the growth and development process. The age of 3 to 4 years can be said to be the golden age of a child, and only occurs once in the child's growth and development process. Early
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childhood development can focus on a balance of physical, cognitive, socio-emotional, and creative focus that can be used as a basis for good growth and development (Prasetyo, 2020). Motor development is one of the many processes of child development that are very
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important. Motor development can be classified into two categories namely, gross motor and fine motor (Rachman, Anggita and History, 2018). Fine motor activity can be said as any motor activity of the body that causes the movement of small or fine muscles (Suharjana, 2019). This movement requires a regular combination of eyes and hands accompanied by good motor control, so that it can carry out precise and accurate movements when moving (yunita *et al.*, 2020).

The factors that have an impact on the growth and development of children, one of which is physical activity or physical activity carried out by the child (Oktavia *et al.*, 2019). Physical activity is a whole body movement that requires energy expenditure and is produced by skeletal muscles (Shadap, 2021). Physical activity is important in daily life at all ages (Gil-Madrona *et al.*, 2019). However, time continues to run so as to create an increasingly millennial situation where technological developments are increasingly sophisticated causing people to do less physical activity, especially in childhood, where the intensity of physical activity is lowest compared to other ages (carson *et al.*, 2017). However, time continues to run so as to create an

increasingly millennial situation where technological developments are increasingly sophisticated causing people to do less physical activity, especially in childhood, where the intensity of physical activity is lowest compared to other ages (carson *et al.*, 2017).

Early childhood physical inactivity has a negative impact on physiological health (Julian *et al.*, 2022). In del pozo-cruz's research (2019), increasing physical activity and avoiding sedentary activities in early childhood will affect their lives, because these 2 things affect the health and well-being of early childhood. Physical activity also affects the psychological, and cognitive in children.

In mexico states that 10% of early childhood cannot develop motor skills well and have difficulty, while children's independence is highly developed with their fine motor skills (Niko L. Cempron , MA, 2021). Children will find it easy when doing daily activities such as wearing shoes, combing hair, writing, and other activities.

In 2015 unicef conducted a survey of the 200 million children aged 5 years and under in developing countries, more than one third of whom do not fulfill their potential in terms of child development. Data in 2017, 13%-18% of children under

five in indonesia have growth and development disorders (ministry of health, 2017). Research conducted (pratama & hanief, 2021) said that there was a relevant relationship between physical activity and fine motor skills while the research conducted (rahayu *et al.*, 2021) stated that there was no significant relationship between physical activity and fine motor skills, so here the author is interested in taking a study entitled the relationship between physical activity and fine motor skills in paud children.

METHODS AND MATERIALS

In this study, using a cross-sectional study method, which means the research was conducted by observing at one time and there was no further action on the respondents. This study aims to see whether there is a relationship between 2 variables, namely the independent variable and the dependent variable by measuring at one time (Suryana, 2019). The independent variable in this study was physical activity and the dependent variable was fine motor skills.

The sampling technique is the total sampling technique. According to Sugiyono (2017) total sampling is a sampling technique if all members of the population are used as samples. This

sample is used if the population is relatively small, namely no more than 30 people, total sampling is also called a census, where all members of the population are used as samples.

There are 2 instruments used in this study, namely measuring children's physical activity using a questionnaire that will be filled out by parents in the form of a google form and measuring fine motor skills using DDST (Denver Developmental Screening Test) where children will carry out 4 activities including imitating box images, imitate the circle image, arrange blocks into towers and wiggle thumbs.

The place of research is at PAUD Islam Makarima which is located in Kartasura. The study was conducted on January 4-5, 2022 at PAUD Islam Makarima while still carrying out health protocols based on the Ethical Clearance Letter No. 1.077/XII/HREC/2021 issued by the Health Research Ethics Commission of Dr. Moewardi Hospital. This study has a population of 20 children of PAUD Islam Makarima, totaling 20 children. The inclusion criteria in this study were A) PAUD Islam Makarima children, B) Age 3-4 Years, C) Physically Healthy, D) Active In School Activities And The Exclusion Criteria Are A) Children Are

Participating In Other Research, B) Not Willing To Participate In Research.

RESULT

Characteristics of Respondents

Table 1. Characteristics of Respondents

| Characteristics of Respondents | Freq | Persent (%) |
|--------------------------------|------|-------------|
| Gender | | |
| Men | 6 | 30% |
| Woman | 14 | 70% |
| Age | | |
| 3 years | 5 | 25% |
| 4 years | 15 | 75% |
| Physical Activity | | |
| Not enough | 0 | 0% |
| Enough | 20 | 100% |
| Fine Motor Skills | | |
| Success | 18 | 90% |
| Unsuccess | 2 | 10% |

Based on table 1, it was found that there were 6 male respondents with a 30% presentation and 14 female respondents with a 70% presentation, then respondents who were 3 years old were 5 with a percentage of 25% and those aged 4 years were 15 with a 75% presentation. There are 2 categories of physical activity, all 20 respondents have sufficient physical activity categories, while in the fine motor skills test there are 2 children who fail with a presentation of 10% and 18 children pass with a presentation of 90%.

Data Analysis

The relationship between the classification of physical activity and fine motor skills with the type of non-

parametric test processing (Kendal) will be explained in table 2, namely

Table 2. Non-Parametric Test Results (Control Test)

| Classification | andall's W | df | P value | description |
|------------------------------------|------------|----|---------|-------------------------|
| <i>Physical Activity</i> (n=20) | 0,89 | 5 | 0.000 | H ₀ rejected |
| <i>Fine Motor Skills</i> (n=20) | | | | |

Based on the statistical table above, it is known that $P = 0.000$ ($P < 0.005$) which means that there is a relationship between physical activity and fine motor skills with the type of non-parametric test (Kendal) processing.

DISCUSSION

According to McPhillips and Jordan-Black (2017) Fine motor skills are the ability to control movements, such as finger and hand movements, through coordinated nervous system and muscle activity. Fine motor skills are one of the basic motor skills, namely basic movements that must be mastered by children from an early age (Saparhayuningsih, 2020). These skills need to be taught properly, so knowing your child's basic skill level is an important foundation for designing the right motor development program for your child.

The measurement of fine motor skills is carried out using the DDST (Denver Developmental Screening Test), children carry out activities according to the general stated on the DDST it is found that 90% have passed the fine motor skills test, while in the measurement of fine motor skills there are 3 categories, namely pass if the child can carry out orders well, fail if the child cannot carry out orders and refuse if the child does not want to (in bad condition) when doing research. In the measurement of fine motor skills, 10% of the respondents were found to have failed when doing the test. Factors that cause children to fail when carrying out activities are lack of concentration and children are less interested in carrying out predetermined activities.

Administration of physical activity by leading to an increase in fine motor skills and function caused by constant muscle activity as a background for actual movement so that it can maintain basic body postures (Ghasemian, 2020). Each time a muscle is stretched, the excited spindle causes contraction of the same muscle reflex and synergistic muscle (Ganguly *et al.*, 2021). That alpha gamma activation produces contraction of the extrafusal and intrafusal fibers according to the position and command of the force

from the brain to the spinal cord (Enander *et al.*, 2022).

The benefit of the technique is to increase the activation of the core muscles or body-forming muscles (Sokunbi, 2021). This results in control of the trunk. The stimulus provided by this technique causes an increase in the activation of the neuromuscular junction (Pitt, 2018). The activation of the motor unit so that there is an increase in postural tone at the musculoskeletal level (Mackinnon, 2020).

Stimulus created by passive movement will enter the afferent nerve fibers and will enter the spinal cord (Chen and Perez, 2022). Inside the spinal cord, it will go to the posterior horn cells and then enter the gray matter (Caon, 2018). For a stimulus to reach the brain, it must pass through a tract in the white matter (Kotikalapudi *et al.*, 2022). The spinothalamic tract is the terminal for all stimuli to the brain. Then the stimulus will enter the central level, namely the cerebral cortex (Yam *et al.*, 2018).

There are many factors that support children's motor development, one of which is physical activity. If the child's body is well developed, it is likely that the child can develop his own physical skills and explore the environment without the help of others. Lack of physical activity or

lack of exercise can affect a child's health. When a person is not physically active, the body uses very little energy, and if energy intake is not balanced with proper effort, it can result in obesity or overweight (Leonardo & Komaini, 2021).

Children aged 3-4 years who have sufficient activity intensity compared to children who have less physical activity intensity, of course, their fine motor development is different. Children who have sufficient intensity of physical activity, of course, often get more learning stimulation, the children will master these skills more quickly. In this study, children were tested to determine the level of physical activity using the EYPAQ (Early Year-Physical Activity Questionnaire) questionnaire where parents filled out the questionnaire by recalling their child's activities for the last 7 days, according to Bingham's research (2016) there are 2 categories of activity in children, namely lack of physical activity (if the time used by children in active movements is less than 180 minutes / day) and sufficient physical activity (if the time used by children to move actively reaches 180 minutes / day or more), in this study it was found all respondents got enough activity category. On average, children have done activities well at school and added when at

home children will do activities that make children active. Physical activity and experiences that children get from the surrounding environment also have a very large influence on the development of children's fine motor skills.

CONCLUSION

Based on the study of the data and the discussion above, it can be concluded that a p-value of $0.000 < 0.05$ is found, which means that there is a relevant relationship between the two variables, namely physical activity and fine motor skills in preschool children. Physical activity is very influential in the development of children's fine motor skills. Children in poor physical condition will inhibit the growth and development of motor movements in their bodies and if, children who have good motor movements, their growth and subsequent development will be good. Therefore, physical activity must be balanced with motor movement, which is indispensable in daily activities in life.

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