IHLJ | Indonesian Health Literacy Journal
E-ISSN: XXXX-XXXX | ihlj.sapublisher.com | Suluh Adiluhung Publisher (SAPub)

EFFECTIVENESS OF PUZZLE EDUCATIVE GAME TOOLS ON MOTOR DEVELOPMENT IN 6-YEAR-OLD CHILDREN AT KINDERGARTEN SANTA MARIA PARE, KEDIRI DISTRICT

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ABSTRACT

Training the development of fine motor skills is very important, so activities are needed that can help in the process of developing children's fine motor skills. Delays in fine motor development will have an impact on subsequent development, where there are long-term negative impacts for children who experience delays in basic motor development. The aim of this research was to determine the effectiveness of educational puzzle games on fine motor development in children aged 6 years. The research design is pre-experimental with a one group pretest - posttest design. The population was all 6-year-old children in Kindergarten Santa Maria, Pare District, Kediri Regency, East Java, totaling 92 children, a sample of 48 respondents using a purposive sampling technique. The data collection technique uses a questionnaire. Data analysis used the Wilcoxon test with the p value < α, α:0.05. The results of the research showed that before the treatment, almost all respondents had questionable fine motor development, namely 39 respondents (81.2%), whereas after treatment, almost all respondents had appropriate fine motor development, namely 45 respondents (93.8%). %). Results of data analysis sig value (2-tailed): 0.001. Educational puzzle game therapy influences fine motor development in children aged 6 years. Routine activities to stimulate the development of fine motor skills can improve the fine motor development of pre-school aged children, one of which is using educational puzzle games so that they can run optimally.

Keywords: *Educational Games, Puzzles, Fine Motor, 6-Year-Old Children*

INTRODUCTION

It is very important to instill education in children from an early age because various research on the brain has shown that early childhood is the golden age for children's brain development to obtain education (Soetjiningsih, 2016). Based on the results of research conducted by Safira (2023), it shows that training the development of fine motor skills is very important, so activities are needed that can help in the process of developing children's fine motor skills (Safira, 2023). Delays in fine motor development will have an impact on subsequent development. There are long-term negative impacts for children who experience delays in basic motor development. The child will not be able to join in group matches or

participate in sports activities while at school or even later in adulthood (Husnawati & Watini, 2022).

Growth is an increase in the number and size of cells throughout the body which can be quantitatively measured, while development is an increase in the function of the body's organs which can be achieved through growing maturity and learning. In this case, parents must be selective in creating an environment for children, including choosing the type of play equipment for children and understanding the function of these tools in children's development (Sapri et al., 2021).

WHO (World Health Organization) reports that 5-25% of pre-school children suffer from minor brain dysfunction, including fine motor development disorders (WHO, 2016). According to the Indonesian Ministry of Health in 2017, 0.4 million (16%) toddlers in Indonesia experienced fine and gross motor development disorders, hearing loss, reduced intelligence, and speech delays (Indonesian Ministry of Health, 2017). Based on data from the 2017 East Java Province Level 1 Health Service, the detection of preschool children's development in East Java was set at 80%, the detection coverage of preschool children's growth and development was 45.99%. Fine motor development disorders also often occur in preschool children as much as 31.25%. Data from the Kediri District Health Service (2023) from January to December, of 67,989 toddlers, there were 10,076 toddlers experiencing growth and development disorders, of which 20.45% of children experienced delays in fine motor skills.

Motor development is greatly influenced by nutrition, health status and movement treatment according to the developmental period. Poor nutritional status will hinder the rate of individual development (Syafiq, 2007). There are four factors that influence child development, namely severe chronic malnutrition, inadequate early stimulation, iodine deficiency and iron deficiency anemia (Rika Fitri Diningsih et al., 2021). Malnutrition can cause growth and development disorders. The development of a child's fine motor skills is influenced by several factors, one of which is environmental factors, both the environment before the child is born and after the child is born. The nutritional status, nervous system and brain as well as the child's intelligence level also influence development (Sartika et al., 2021).

Delays in fine motor skills during this period can cause children to have low self-esteem, jealousy of other children, dependency, and embarrassment. This can make it difficult for children to enter school because fine motor skills are very necessary for socializing with their peers in terms of playing and writing. The feeling of dependence on children will result in a decrease in achievement far below the child's abilities (Humaedi et al., 2021).

To overcome the problems above, fine motor stimulation efforts are needed. Early stimulation is a series of activities aimed at providing early experience to children through various activities that stimulate the formation of basic developmental abilities so that children's growth and development becomes optimal (Sanggu et al., 2021).

Based on the research results, it was concluded that there are many activities that parents and teachers can do to train and improve the fine motor skills of young children. These activities include scribbling or drawing lines, arranging, shaping, drawing, coloring, cutting, folding/origami, mosaic, montage, collage, finger painting, weaving and weaving (Sulistyo et al., 2021).

Stimulation of growth and development can be done by providing games or playing, remembering that by playing children will learn from life, so children always need fun for themselves. Therefore, it is not surprising that childhood is synonymous with playing, because during this period children's development will begin to be sharpened according to their needs. However, many people think that children's playing time does not need special attention, so many parents let their children play without paying attention to the educational elements of the children's games (Soetjiningsih, 2016).

According to Soetjiningsih (2016), educational game tools (APE) can optimize children's development, adjusted to their age and level of development (Soetjiningsih, 2016). Puzzle games are a type of educational game to train children's thinking patterns in arranging pieces into a whole that has a complete shape (Sistiarini, 2021). The play therapy that will be used in this research is puzzle play therapy. Games that can develop the ability to equate and differentiate gross and fine motor coordination in controlling emotions (puzzles).

Seeing the importance of the problem above, researchers are interested in conducting research on "The Effectiveness of Puzzle Educational Game Tools on Motor Development in 6-Year-Old Children at Kindergarten Santa Maria Pare, Kediri Distric."

METHOD

In this research, the type of research used is pre-experimental, which aims to determine the symptoms or effects that arise because of certain treatments or experiments. Meanwhile, the research design used is one group pretest posttest. The characteristic of this type of research is that it reveals cause and effect relationships by involving one group of subjects. The subject group was observed before the intervention, then observed again after the intervention (Murti, 2014).

Research instruments are data collection tools that are prepared with the aim of obtaining appropriate data. The research instrument used was an observation sheet. In this case, it is aimed at observing the fine motor development of pre-school children before and after the puzzle game using the KPSP observation sheet (Pre-Developmental Screening Questionnaire).

RESULT AND DISCUSSION

Finding

General data

Table 1 Characteristics of Respondents Based on Gender

No	Gender	Frequency (n)	Procentage (%)
1	Male	23	47,9%
2	Female	25	52,1%
	Total	48	100%

Based on table 1, it is known that of the 48 respondents, most respondents were female, namely 25 respondents (52.1%).

Specific Data

1. Univariate Analysis of Fine Motor Development Before Being Given an Educational Puzzle Game

Table 2 Fine Motor Development in 6-Year-Old Children Before Being Given Educational Puzzle Games

No	Fine Motor Development	Frequency (n)	Procentage (%)
1	Deviation	9	18,8%
2	Doubtfulness	39	81,2%
	Total	48	100%

Based on table 2, it is known that before treatment, almost all the 48 respondents had questionable fine motor development, namely 39 respondents (81.2%).

2. Univariate Analysis of Fine Motor Development After Being Given an Educational Puzzle Game

Tabulation 3 Fine Motor Development in 6-Year-Old Children After Being Given Educational Puzzle Games

No	Fine Motor Development	Frequency (n)	Procentage (%)
1	Doubtfulness	3	6,2%
2	Appropriate	45	93,8%
	Jumlah	48	100%

Based on table 3, it is known that after treatment from 48 respondents, almost all respondents had appropriate fine motor development, namely 45 respondents (93.8%).

3. Bivariate analysis of fine motor development before and after being given an educational puzzle game

Table 4 Tabulation of Fine Motor Development Before and After Being Given an Educational Puzzle Game

No.	Fine Motor Development	*Puzzle*			
		Before		After	
		f	%	f	%
1	Deviation	9	18,8	0	0,0
2	Doubtfulness	39	81,2	3	6,2
3	Appropriate	0	0,0	45	93,8
	Total	48	100	48	100

Based on table 4, it is known that before the treatment was carried out, almost all respondents (81.2%) had doubtful fine motor development, whereas after the treatment almost all respondents (93.8%) experienced an appropriate increase in fine motor development.

Table 5 Results of Wilcoxon Analysis of the Effectiveness of Puzzle Educational Game Tools on Fine Motor Development in 6-Year-Old Children at Kindergarten Santa Maria Pare, Kediri District

No.	Variable	N Diference		α	P
1.	Fine Motor Development Pre Test – Post Test	Positive	: 47	0,05	0,000
		Negative	: 0		
2.	N = 48	Ties	: 1		

Based on data analysis using the Wilcoxon test, the results obtained were p value = 0.000 and the error level (α) = 0.05, so p < α, then Ho was rejected and H1 was accepted,

meaning that educational puzzle game tools are effective in improving fine motor development in children aged 6 years in Kindergarten Santa Maria Pare, Kediri District.

Discussion

Identifying the Fine Motor Development of 6-Year-Old Children Before Being Given an Educational Puzzle Game

Based on the research results, it is known that before treatment, almost all of the 48 respondents had questionable fine motor development, namely 39 respondents (81.2%). Early childhood which is in the age range of 4-6 years is a very important period (golden age). This age is a sensitive period for children, a sensitive period to accept various efforts to develop the child's full potential (Ratna Wirantika & Susilowati, 2020) . Fine motor development includes developments that involve the coordination of small/smooth muscles and their functions. Fine motor movements are the flexibility of fine muscles such as the fingers using coordination between the eyes and hands (Nursasmita, 2022).

Delays in fine motor development will have an impact on subsequent development. There are long-term negative impacts for children who experience delays in basic motor development. The child will have difficulty joining group matches or participating in sports activities while at school and even later in adulthood (Agustiningrum Maria; Tjetjep Rohendi Rohidi, 2020). Through normal motor development, children will be able to play and socialize with their peers, whereas children with abnormal motor development will hinder the child from interacting with their peers and will even feel isolated or become a fringer (marginalized) child (Ranti et al. , 2023). Internal and external factors greatly influence the rate of fine motor development. Genetic factors, IQ (Intelligence Quotient) factors and chromosomal abnormalities are internal factors, while external factors include birth, parenting patterns, nutritional conditions, stimulation, and health factors (Setyawan et al., 2018).

Parents play an important role in supporting children's motoric aspects. Parents play a role in shaping a child's good personality because parents are the main educators for children (Santrock, 2017). Good parenting will help improve children's development in all aspects. The condition of nutrition and nutrition as well as the health of children greatly influences the physical development of children in supporting their growth and development. Good nutrition and health will help children learn new things more optimally. For the respondents of this study, each child was picked up and picked up by their parents. The nutritional and health conditions of the respondents looked good, the children looked very active in school activities, even the parents always brought food supplies so that the children did not snack carelessly (Nurhidayah et al., 2018).

Providing stimulation to children is the right step to prevent delays in fine motor development. Children who receive targeted stimulation will develop more quickly than children who receive little or no stimulation. Children who receive less stimulation will experience obstacles in growth and development as well as difficulties in interacting with other people (Mardhiah & Sartika, 2021).

Based on observations before being given the educational puzzle game, which was also carried out at Santa Maria Pare Kindergarten, Kediri Regency, it was still felt that there was a lack of eye and hand coordination such as cutting, holding a pencil and drawing lines correctly. In the cutting activity, the child still looks limp in moving between the thumb and

forefinger, the way to cut is also not very correct, while the activity of drawing a line by holding a pencil between the thumb and forefinger is the same as the activity of cutting, the activity of drawing a line using a pencil the child is also less able to do it. controlling hand and eye coordination, children's hands still look weak and stiff (Wahyuni, 2018).

Based on general data from respondents, it is known that most respondents were female, namely 25 respondents (52.1%). Several factors influence the development of fine motor skills in early childhood, namely age and gender. A child's ability to perform certain motor movements will not be the same as other children even though they are the same age. This situation shows that there are children who still lack mastery of fine or gross motor movements (Sumantri, 2015). Kartikawati (2010) provides a theory which states that girls are easier to manage and calm in contrast to boys who tend to be more adventurous, more difficult to manage, often argue with their parents and are difficult to direct.

Based on facts and theories about children's gender, researchers are of the opinion that girls are easier to manage and obey their parents, this is different from boys who tend to be difficult to manage and direct and boys usually often argue with their parents and more aggressive. Gender differences also influence the motor development of kindergarten children. Girls more often practice skills that require body balance, such as jumping rope or jumping with a large ball (hopping). Meanwhile, boys prefer to practice the skills of throwing, catching, and kicking a ball or behavior that emphasizes speed and strength. Boys also prefer to participate in activities that train gross motor skills, while girls prefer fine motor skills.

Identification of Fine Motor Development of 6-Year-Old Children After Being Given an Educational Puzzle Game

Based on the research results, it is known that after treatment from 48 respondents, almost all respondents had appropriate fine motor development, namely 45 respondents (93.8%).

Based on observations by looking at research data, in general it can be said that children's fine motor development is appropriate. This is influenced by the opportunity to learn, and the easy and appropriate stimulation provided to improve children's fine motor development, one of which is through educational puzzle games. In this activity, children can play with pieces of shapes by using direct movements of their fingers to combine them to form a suitable image.

Apart from influencing the development of children's fine motor skills, it is hoped that the habit of playing with puzzles will train children to be calm, persistent, patient, and independent in completing things. The satisfaction obtained when children finish putting together the pieces is often called playing puzzles, so playing with puzzle media is one medium that can form children's independent attitudes (Saroinsong et al., 2021).

Thus, it can be said that the puzzle playing method given to pre-school children who are experiencing suspect development, has the effect of increasing the fine motor development of pre-school children. This is because children are often treated, so that the coordination of the small muscles in the hands can be trained so that they can hold the picture pieces and place them correctly. So that the child no longer has difficulties and ultimately the child's eye and hand coordination work well. Increased development of children's fine motor skills before and after due to regular stimulation being received by the five senses and then being conveyed to the brain (Almonacid et al., 2023). The child's brain and five senses have not yet

reached a new level. This will trigger the brain to learn, analyze, understand and respond appropriately to the stimulus. Stimulus should be given every time there is an opportunity to interact with children. The more frequently and regularly the stimulation is received, the stronger the connection between the brain cells (Mahfud & Yuliandra, 2020).

Analysis of the Effectiveness of Puzzle Educational Game Tools on Fine Motor Development in 6-Year-Old Children at Kindergarten Santa Maria Pare, Kediri District.

The results of data analysis using the Wilcoxon test showed that p value = 0.000 and error level (α) = 0.05, so p < α, then Ho is rejected and H1 is accepted, meaning that educational puzzle game tools are effective in improving fine motor development in children aged 6 years in Santa Maria Pare Kindergarten, Kediri Regency.

Playing can stimulate the senses, learn to use their muscles, coordinate their eyes with their movements, gain mastery of their bodies, and gain new skills. Playing is not only beneficial for children but also for education for all ages. Playing knows no age, therefore playing can be done by anyone, anytime and anywhere, it's just that the media used is different between adults and children. Therefore, play media for early childhood must adapt to the child's developmental abilities and age (Sistiarini, 2021).

Puzzles are said to be a type of game that uses pieces of objects or pictures, and if you look at the type of material used, there are various types, some are made of cardboard, or can also be made of wood. In accordance with the child's development and the older the child, the higher the difficulty level of the puzzle. This can be seen from the increasing number of pieces or pieces used. There are several types of puzzles that can be used in the learning process through play in early childhood, namely: 1) Spelling puzzles, namely puzzles consisting of random pictures and letters to be matched to form the correct vocabulary, 2) Jigsaw puzzles, namely puzzles which is in the form of several questions to be answered then from the answers the first letters are taken to be put together into a word which is the answer to the final question, 3) The thing puzzle, namely a puzzle in the form of descriptions of sentences related to pictures of objects to matched, 4) The letter(s) readiness puzzle, namely a puzzle in the form of pictures accompanied by the letters of the name of the picture, but the letters are not yet complete, and 5) Crosswords puzzle, namely a puzzle in the form of questions that must be answered by entering the answers into the boxes provided both horizontally and vertically.

Children aged 5 years can already play puzzles, of course with a number of puzzle pieces which are few and the difficulty level is easier. In early childhood, especially aged 5-6 years, children can be introduced to puzzles with simple shapes consisting of just one piece, and the older the child, the more complicated the level of difficulty will usually be. Puzzles are one of the games that can be interesting, because this method can motivate children to like biology lessons, which are related to animals or animals. Puzzle is a type of game where pieces of images or complete three-dimensional objects are played (Saroinsong et al., 2021).

The study above shows that educational puzzle game activities given to preschool aged children at Santa Maria Pare Kindergarten, Kediri Regency have a significant influence on the development of children's fine motor skills, so it can also be said that this puzzle playing activity can be applied to help preschool aged children develop fine motor skills. In this way, puzzle games can improve the fine motor development of preschool children at Kindergarten Santa Maria Pare, Kediri District.

The results of this research are in accordance with the reality at Santa Maria Kindergarten where respondents who can receive direction and input from researchers can carry out puzzle games well, shown by the speed of time in forming an image. The faster the respondent produces a pattern; the better the child's fine motor development will be. Based on these results, puzzle games are an educational game that can improve children's fine motor development

CONCLUSION

Before treatment, almost all respondents (81.2%) had questionable fine motor development. After treatment, almost all respondents (93.8%) had appropriate fine motor development. Puzzle educational game tools are effective for improving fine motor development in 6-year-old children at Kindergarten Santa Maria Pare, Kediri District in 2019. The Wilcoxon test results obtained p value = 0.001 and the error level (α) = 0.05, so p < α, then Ho rejected and H1 accepted.

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