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Effect of Puzzle Games on Fine Motor Development In Children Aged 4-5 Years

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ABSTRACT

Background: A child's future quality of life depends on optimal growth and development, so identification, stimulation, and intervention for various growth or developmental disorders must be carried out from an early age Puzzle games are one way to train preschoolers to solve problems and think more logically.
Methods: This study used a quasi-experiment with a pretest-posttest design. Sampling technique was total sampling technique. The sample size was 30 respondents who were children aged 4-5 years. Sampling was based on inclusion and exclusion criteria. The following are the inclusion criteria: children aged 4-5 years and are in good health. The exclusion criteria are: children who cannot be present when the puzzle game is played, and children who cannot complete the game within the specified time. Analyzed used wilcoxon test
Results: The results of the research of all 30 students experienced an increase in writing learning outcomes with an average increase of 15.50 and a positive ranking of 465.00 similarities in pre-test and post-test results. The significant value result is (p 0.000). The average value of fine motor development in children aged 4-5 years before playing the puzzle game was 14.00 and after the puzzle game the average was 16.00. The p value for fine motor hand skills is 0.046, then the fine motor value of speed is 0.000, and the fine motor value of precision is 0.000.
Conclusion: There is an influence of puzzle games on the development of fine motor skills of children aged 4 – 5 years Children's fine motor development has improved after being given a puzzle game, it is hoped that it can be used as input in adding insight and information about fine motor development in children aged 4-5 years

Keyword : Puzzle Games; Fine Motor Development

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Background. The determination of the quality of a child's future is based on the optimal growth and development of children, so identification, stimulation and intervention for various growth or developmental disorders must be carried out from an early age, because the motor abilities and intelligence of each child are different. There are groups whose gross motor skills are more dominant and groups whose fine motor skills are more dominant. Similarly, environmental, nutritional, racial and genetic stimulation has an important influence on motor development, this can be seen from the difference in the average of children in America and Western European countries, so that the motor development of Indonesian children is relatively weak. (Mindarsih dan Dewi. N, 2021)

According to the Indonesian Ministry of Health (2013), developmental screening has been conducted in 30 provinces in Indonesia, including West Java, Lampung, and South Sumatra, and it was reported that 45.12% of infants experience developmental disorders. Additionally, nearly 30% of children in West Java experience developmental delays, and about 80% of these are caused by a lack of stimulation. And nearly 50% of toddlers in Lampung Province in 2012, based on the results of early intervention stimulation

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detection for growth and development (SDIDTK), showed fine motor development disorders of 14.7%. And in 2013, fine motor development disorders were found to be 16.2%. According to the survey results, the incidence rate in South Sumatra in 2018 was nearly 11.7% of toddlers aged 2–5 years experiencing developmental delays, where South Sumatra had a rate of 11.5%, one of the factors affecting fine motor development. (Popy A dan Bramtama Sukma M, 2021)

The slightest deviation, if not detected and handled appropriately, will have an impact on the quality of your future talent. The support that should be given is compassion. Stimulation of the elderly and food intake. Therefore, they need a good companion during this time to maximize their brain development (Kusumawati Indri al et, 2023).

Two hundred and five million children under the age of five in low- and middle-income countries are at risk of not reaching their potential. Government investment in the development of early childhood education is still low. For example, 27 sub-Saharan countries spent only 0.01 percent of their GDP on early childhood education in 2012 (Unicef, 2020).

Delayed motor development refers to motor development that is below the average age of children. As a result, children at a certain age fail to master the developmental tasks expected by their social group. Possible brain damage at birth or an inappropriate environment early in life. The impact of delayed motor development is very dangerous for children's social and personal development. As a result, children often experience behavioral disorders, emotions, and losses when they start playing with their friends (Aulina, 2017).

One of the causes of child growth and development disorders is the lack of stimulation in children. There are still a lot of fine motor disorders in preschool-age children that require proper treatment. Some of the factors that affect growth and development are genetic and environmental factors (prenatal, postnatal, biological, psychosocial, physical, family, parental education, parenting and customs). (Mindarsih dan Dewi. N, 2021)

Fine motor development is the maturation of body movements and the development of the element of control. Physical condition, athletic ability, and athletic ability all influence each other. Without mature motor control, early motor skills will not develop. Without physical strength and exercise, motor development will not be optimal. (Denok DA, 2022)

One of the play activities that can develop children's fine motor skills is by playing puzzles. Puzzle games are an interesting means to learn about shapes, colors and relationships with objects. What includes puzzles is three-dimensional objects that can be disassembled by children. Playing puzzles is a game that requires patience and perseverance in assembling it. Therefore, by getting used to playing puzzles, gradually make the child's mentality used to being calm, diligent and patient in solving things. (wahyuni al et, 2021) Added as the reason for choosing Raudhatul Athfal Bligo 1 Kindergarten, Ngluwar District, Magelang Regency as the research location to fulfill the need for puzzle games in the development of fine motor skills in children aged 4–5 years

One of the play activities that can develop children's fine motor skills is playing with puzzles. Puzzle games are an interesting means of learning about shapes, colors, and relationships with objects. Puzzle games include three-dimensional objects that children can take apart. Playing with puzzles is a game that requires patience and perseverance in assembling them. Therefore, by getting used to playing with puzzles, children will gradually develop a calm, diligent, and patient mindset in solving problems. (Wahyuni et al., 2021)

The reason for choosing Raudhatul Athfal Bligo 1 Kindergarten, Ngluwar District, Magelang Regency as the research location is because the school is easily accessible and after asking the teachers there, it turns out that they have not implemented puzzle games in their teaching, so the researcher chose this school as the research location to fulfill the

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need for puzzle games in the development of fine motor skills in children aged 4-5 years

Methods. This study used a pre-experimental design with a single group pre-test and post-test design. This study was conducted at Raudhatul Athfal Bligo 1 Kindergarten, Ngluwar District, Magelang Regency, in April–May 2024 with the approval of the school teachers and parents. The total population in this study was 30 children. The sampling technique used total sampling with inclusion and exclusion criteria. The following are the inclusion criteria: children aged 4-5 years old who attend Raudhatul Athfal Bligo 1 kindergarten and are in good health. The exclusion criteria are: children who are unable to attend when the puzzle game is played, and children who are unable to complete the game within the specified time.

Data collection was carried out before and after the intervention. Measurement of achievement of fine motor development using indicators that are coded and then given a value or weight. This activity lasted for 30 – 60 minutes. The media used in this study were picture puzzles and observation sheets that had been tested by the Principal of Raudhatul Athfal Bligo 1 Kindergarten, Ngluwar District.

Result and Discussion. The following are the results and discussion of the research on the effect of puzzle games on the fine motor development of children aged 4-5 years old.

Table 1. Pre-test results measuring manual skills, accuracy, and speed.

No	Ability Level	Indicator	Frequency	Percentage
			Pretest	
1.	Manual Dexterity	BB	0	0 %
		MB	4	13 %
		BSH	26	87 %
		BSB	0	0 %
2.	Accuracy	BB	0	0 %
		MB	4	13 %
		BSH	26	87 %
		BSB	0	0 %
3.	Speed	BB	0	0 %
		MB	4	13 %
		BSH	26	87 %
		BSB	0	0 %

Description: BB (Not yet developed), MB (Starting to develop), BSH (Developing as expected), BSB (Developing very well).

Table 2. Post-test results measuring manual skills, accuracy, and speed.

No	Ability Level	Indicator	Frequency	Percentage
			Pretest	
1.	Manual Dexterity	BB	0	0 %
		MB	0	0 %
		BSH	30	100 %
		BSB	0	0 %
2.	Accuracy	BB	0	0 %
		MB	0	0 %
		BSH	19	63 %
		BSB	11	37 %
3.	Speed	BB	0	0 %
		MB	0	0 %
		BSH	16	53 %
		BSB	14	47 %

Description: BB (Not yet developed), MB (Starting to develop), BSH (Developing as expected), BSB (Developing very well).

Identifying the fine motor skills of children aged 4 to 5 years before being given the implementation of the puzzle game

The results of the study showed that children before being given the implementation of puzzle games had an average score of 17.03%. In the aspect of hand skills, the results were obtained as many as 4 children (13%) with the category still developing (Starting to develop) and 26 children (87%) with the category of developing according to expectations (Developing as expected).

In the aspect of meticulousness, the results were obtained as many as 20 children (67 %) with the category still developing (Starting to develop) and 10 children (33%) with the category of developing as expected (Developing as expected). Then in the aspect of speed, the results were obtained as many as 21 children (70%) with the category still developing (Starting to develop) and 9 children (30%) with the category developing according to expectations (Developing as expected).

There are several factors that can affect children's fine motor development, namely genetic nature, obstacles at the beginning of

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post-birth life, difficult births, environmental disturbances, the presence of stimuli, impulses and opportunities, premature birth, physical disabilities (Rosleny, 2021). Smooth motor delay in children is caused by parental education,parental age, occupation, environmental factors, nutritional intake, children's personality, and others (Fitriyah, 2023).

The results of the study (Sulistia, 2023) found that the average fine motor development score before being given the puzzle play treatment was 1.979. with a standard deviation of 0.534. Meanwhile, the posttest score after the intervention of the educational puzzle game was obtained on average 3.631. with a stssndar deviation of 0.268. It can be seen that the average score difference between the pretest and the posttest is 1.651, and the standard deviation is 0.319. The results of the statistical test resulted in a Ho value rejected and Ha accepted (p-value 0.0001 < α = 0,05). In line with the results of Nariman Aral's research, the use of puzzle models is an important factor in improving motor skills in children. In short, the use of puzzles has important consequences for the development of fine motor skills. To find out the fine motor skills of children aged 4 to 5 years after they do a puzzle game. Based on the results of the study, after the introduction of puzzle games, children's fine motor skills increased from 17.03 to or 25.87. In the area of hand skills, 30 children (100%) achieved results that showed expected development in the category (BSH). About skills, 19 children (63%) showed expected development (BSH). (37%) in the "Excellent Development" (BSB) category. Regarding speed skills, 16 children (53%) in the expected development catagory (BSH) and 14 children (47%) in the "very good" (BSB) category Puzzle games are activities that provide opportunities for children to improve their problem-solving skills where a picture is cut into parts and children are expected to be able to rearrange the pieces so that they become a complete picture. This game trains preschoolers to think more logically in considering which pieces are suitable and which are not, and helps children find the right pieces when they are impatient. This game teaches children to keep moving forward (Mansur, 2019).

This research is in line with the research conducted by (Cindy Fitriani Yanti, 2021). After participating in the puzzle game, a post-test was given and there was an increase in fine motor development scores. This means that 9 children who previously scored 5, 4, and 3 increased from 6, and 2 respondents scored 5. Although respondents failed the three -part character drawing test, each person's score increased from 3 and 4 to 5, and 6 respondents had the same score but the test results they took increased. The results are cleaner than the results of the previous test. The results of this study show that the puzzle game method can increase the average value of fine motor development. The given puzzle game method was able to improve by an average of 1.12, while the control group that did not receive the treatment achieved an average of 0.53.

can see that the puzzle playing method is more influential compared to the group that is not given treatment, because in playing puzzles children learn about the concepts of shape, color, size and number which can help develop children's fine motor skills by involving eye coordination and training the muscles of the fingers.

This is supported by research conducted by (Yuniati, 2018) stating that the average fine motor development of children before and after being given a puzzle game there was a significant increase in fine motor development as seen from the average increase before being given an educational puzzle type game, which was 3.35 to an increase after being given an educational puzzle type game, which was 1.88.

Research conducted by (Da'i & Maulidaty, 2021) entitled "The Effect of Playing Puzzle Therapy on the Fine Motor Development of Pre-School Children in Tk Harapan Batokan Kasiman" explained that there was an effect of puzzle games on the fine motor development

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of pre-school children as seen from the average development before being given puzzle play therapy which was 7.87, the standard deviation was 1.246 and after being given puzzle play therapy increased to 1.534 with the standard deviation 9.93.

Research conducted by (Da'i & Maulidaty, 2021) entitled "The Effect of Playing Puzzle Therapy on the Fine Motor Development of Pre-School Children in Tk Harapan Batokan Kasiman" explained that there was an effect of puzzle games on the fine motor development of pre-school children as seen from the average development before being given puzzle play therapy which was 7.87, the standard deviation was 1.246 and after being given puzzle play therapy increased to 1.534 with the standard deviation 9.93.

Analyze the fine motor skills of children aged 4 – 5 years before and after being given the implementation of puzzle games

To determine the results of the influence before and after implementation in this study, Wilcoxon analysis was used with the aim of proving the hypothesis of the influence of puzzle games on children's fine motor development. The following are the results of the Wilcoxon test.

Table 3. Wilcoxon Test of Fine Motor Skills in Children Aged 4–5 Years Before and After the Implementation of Puzzle Games.

No	Fine Motor Skills	Sig
1.	Hand Skills	0,046
2.	Speed	0,000
3.	Accuracy	0,000

Puzzle games aim to stimulate children's imagination in perfecting animage. Puzzle is an educational game tool consisting of pieces of a picture of many kinds and colors with the aim that children can arrange these pieces, with puzzle games for children to know more about colors, shapes, in addition to honing children's motor development. (Widayati, 2018)

The puzzle playing method has an effect on the fine motor development of children aged 4 to 5 years, because playing puzzles can coordinate children's eye and hand movements, thus without them realizing that their fine motor skills continue to practice and develop well. In addition, when they play puzzles children can practice to get to know the shapes and how they fill in the blank spaces where the pieces are needed. Puzzles also encourage children to recognize colors, such as which puzzle is red or the thick lines in a piece are suitable, is there the same pattern on the pieces as the others. With this game 53 children can learn that an object or object is composed of parts. This game encourages children to understand how to pair several different elements, (Maghfuroh, 2018)

The results of the study can be found that there is a significant difference in children's fine motor development before and after being given the implementation of puzzle games. Children's fine motor development after being given the implementation of puzzle games has increased compared to before the implementation of puzzle games. This can be seen from the results of the analysis using the wilcoxon test, the p value for fine motor hand skills is 0.046, then the fine motor p value of speed is 0.000, and the fine motor p value of precision is 0.000. Because from the results of fine motor skills, hand skills, speed, and precision (p value ≤ 0.05), it can be concluded that there is an influence of puzzle games on the development of fine motor skills of children aged 4-5 years at RA Aisyiyah Bligo 1.

Research is also supported by research conducted by (Rohaya Tinambunan & Br Ginting, 2020) which shows the result of p value = 0.000 with an error level (α) = 0.05 which means that puzzles provide an effective influence on fine motor skills. A study (Ananda, 2019) stated that the puzzle play method was able to improve the fine motor development of preschoolers aged 4 to 5 years before being given puzzle game therapy with an average score of 7.87 and rising to 9.93

Research (Ananda, 2019) found that puzzle game therapy was able to improve the fine motor development of preschoolers aged 4 to 5 years before being given puzzle play therapy

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with an average score of 7.87 after being given the puzzle play method, the mean value increased to 9.93. The increase in the average score is due to the fact that puzzles are a simple game medium that is played in pairs and requires precision, because children are trained to be able to focus their minds in order to learn more besides playing puzzle lessons about concepts , colors, sizes and quantities that can help develop children's fine motor skills by involving eye and hand coordination and training the muscles of the fingers. Through puzzle playing activities without realizing it, children will learn actively to use their fingers to compose the right picture.

Above understanding can be concluded by the author that fine motor skills are movements that only affect certain parts of the body, are performed by small muscles and require careful coordination, such as playing puzzles, cutting along lines, using brushes, crayons and markers with controls, and folding.

Conclusion and Suggestions. There was an increase in fine motor development of children aged 4 – 5 before and after the implementation of the puzzle game obtained a pvalue of 0.000. This shows that the sig value of 0.000 < 0.05 can be concluded that there is an influence of puzzle games in improving the fine motor development of children aged 4 – 5. Based on the results of this study, it is hoped that midwives will be able to apply puzzle games to help improve fine motor skills, especially at the age of 4-5 years old.

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References.

Ananda.Y ,2019 Pengaruh Terapi Bermain Puzzle Terhadap Perkembangan Motorik Halus Pada Anak Pra Sekolah di Tk Inti Gugus Tulip Iii Padang.Jurnal Keperawatan

Mansur, Arif Rohman. 2019. Tumbuh Kembang Anak Usia Prasekolah.Penerbit. Andalas University Press

Aulina, Choirun Nisak. 2017, p 24. Metodologi Pengembangan Motorik Halus Anak Usia Dini. Penerbit: UMSIDA Press

Dinas Kesehatan Jawa Tengah, 2018. Profil Kesehatan Provinsi Jawa Tengah tahun 2018. Dinas Kesehatan Jawa Tengah.

Fitriyah ,2023. Permainan Puzzle Mempengaruh Perkembangan Motorik Halus Anak Usia 4-5 Tahun.Jurnal keperawatan Jiwa

Kusumawati Indri al et, 2023 Pola Asuh Orang tua dan tumbuh Kembang Balita. Penerbit. CV Jejak

Wahyuni, Mareta dkk, 2021. Panduan Pemilhan,pembuatan, dan pemanfaatan ape secara mandiri,Penerbit Direktorat Pendidikan Anak Usia Dini

Mindarsih dan Dewi.N, 2021, Buku Ajar Pertumbuhan dan Perkembangan Neonatus, Bayi, Balita dan Anak Pra Sekolah.Penerbit.Respati Press

Rohaya tinambunan & br ginting, 2020 pengaruh metode bermain puzzle terhadap perkembangan motorik halus anak pra sekolah di taman kanak-kanak kecamatan siantar kota tahun 2020. Jurnal Penelitian Kebidanan & Kespro

Marliani, Rosleny. 2021 Psikologi Perkembanga Anak dan Remaja.Penerbit CV.Pustaka Setia Bandung

Widayati, Sri. 2018, Buku Panduan dasar APE (Alat Permainan Edukatif), Penerbit Gava Medika Yogyakarta

Rahayu Khoerunnisa, Sulistia. 2023. Pengaruh Bermain Puzzle terhadap Perkembangan Motorik Halus Anak Usia 5-6 Tahun

Unicef, 2020 Perkembangan anak usia dini