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Original Research Paper

The effect of using grain collage media on the development of fine motor skills in children aged 5-6 years

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Abstract
According to World Health Organization (WHO) data, 5–25% of preschool-aged children have mild brain dysfunction, such as fine motor impairments, which is a common cause of preschool developmental failure. According to data from the United Nations Children's Fund (UNICEF), up to 1,375,000 out of every 5 million toddlers had both fine motor and gross motor developmental impairments. The capacity to move smoothly is known as fine motor development, and it has an impact on cognitive development. This study aims to determine the effect of grain collage media stimulation on the fine motor development of children aged 5-6 years at Kharis Kids Tanjung Gusta Kindergarten in 2023. This type of research is a pre-experiment with a one group pretest-posttest design. The population in this study were all students at Kharis Kids Tanjung Gusta Kindergarten aged 5-6 years as many as 20 students in the 2023 Academic Year who will be studied, the sampling technique used was Total Sampling. The research instrument used *KPSP* (Pre-Screening Development Questionnaire) which was assessed before and after grain collage stimulation on the picture pattern. The results of the study showed that the Wilcoxon statistical test revealed a significant value of 0.001 (p-value <0.05). This study discovered that children's fine motor development was significantly impacted by the use of grain collage. It is expected that parents of children between the ages of five and six will be able to keep an eye on their development in accordance with their age in order to optimize their health.

Keyword: children aged 5-6 years; fine motor skills; seed collage media

1. Introduction

Early childhood is an individual aged 0-6 years where rapid and very fundamental development occurs, so that it is called the golden age period (Primayana, 2020). During this period, the brain experiences a brain growth spurt (very rapid development) (Afifah *et al*., 2018). In order to prepare them for future education, it is crucial to offer stimulation that promotes both physical and spiritual growth and development. Early childhood education is a learning approach that focuses on developing children's physical motor skills, intelligence, spiritual, emotional, language, and cognitive abilities (Pura & Asnawati, 2019).

The involvement of small muscles with eye coordination is a fine motor skill that must be achieved because it can be seen in children's focus in children aged 5-6 years (Hasanah, 2021).

WHO data showed that 5-25% of preschool children experienced minor brain dysfunction. According to data from UNICEF, there were 1,375,000 children with fine and gross motor development abnormalities for every 5 million developmental delays (Sundayana *et al*., 2020). According to the 2018 Basic Health Research (RISKESDAS) results, the motor development of children under five years old was 97.8%, and the overall development index in Indonesia was 88.3%. In North Sumatra, the percentage of children under five years old who had a physical ability index based on age was 86.2% (Integritas Susenas dan Riskesdas, 2018).

Factors in the lack of fine motor development of children are through tone disorders, neuromuscular

diseases, spinal cord abnormalities, environmental factors, and the child's personality (Suryani, 2019). A child's fine motor skills are said to be delayed if a 6-year-old child has not shown new skill development, such as the inability to use writing instruments properly and correctly, having difficulty coordinating hand and finger movements flexibly (Sari *et al*., 2020). Impairments in fine motor skills may adversely affect the development of a child's self-concept, which in turn can result in behavioral and emotional challenges (Usriyah, 2020). To address these challenges, children's fine motor skill development can be encouraged from an early age through engaging activities that support such growth-one effective method is utilizing collage-based media.

Collage is an art activity with the technique of sticking objects (seeds, glass, wood) to an area that has been provided to form a certain shape (Huda *et al*., 2019). Research findings suggest that seed collage contributes to the improvement of fine motor skills in children, as its creative and stimulating qualities capture their interest. The activity of sticking, tearing and arranging small pieces of objects can train children's neatness, observance, patience and accuracy through hand and eye coordination (Wandi & Mayar, 2019) which can stimulate curiosity, exploration and innovation and provide direct experience to children (Huda *et al*., 2019). Based on observations conducted by researchers at Kharis Kids Tanjung Gusta Kindergarten, several students were found with low fine motor skills, this was reinforced based on interviews with teaching teachers at Kharis Kids Tanjung Gusta Kindergarten, namely in writing activities, there were 3 children who were not flexible when holding writing tools and 2 children had a little difficulty determining colors and shapes.

Based on these findings, the researcher conducted an exploration to determine the Effect of Using Grain Collage Media on the Development of Fine Motor Skills in 5-6 year-old children at Kharis Kids Kindergarten, Tanjung Gusta.

2. Research Methods

The research utilizes a pre-experimental methodology, with a one-group pretest-posttest design. The intervention given was in the form of grain colostrum media for children aged 5-6 years at Kharis Kids Tanjung Gusta Kindergarten, Hamparan Perak District, Deli Serdang Regency with a sample of 20 children. The intervention was carried out on the sample, namely attaching grain colostrum to the flower and fruit picture patterns provided by the researcher, carried out for 4 meetings, every 1 week carried out 2 times with a duration of 60 minutes each meeting.

This study was conducted from March to August 2023. This study had obtained ethical feasibility from the Research Ethics Commission of Sari Mutiara Indonesia University with an ethical certificate number 2250/F/KEP/USM/VII/2023. The development of children's fine motor skills was seen before (pretest) stimulation was carried out through observation sheets and the Pre-Screening Development Questionnaire (KPSP), then given stimulation of fine motor development using grain collage media and re-observed (posttest) using observation sheets and KPSP. This study measured the independent variable, namely the activity of grain collage media and the dependent variable, namely fine motor development with the measurement results divided into 3 levels, Appropriate (if the answer "Yes" = 9-10 is given a value of 10), Doubtful (if the answer "Yes" = 7-8, given a value of 8) and Deviation (if the answer "Yes" = <6 is given a value of 6). After the researcher obtained all the data, a normality test and bivariate analysis were carried out using the Wilcoxon test.

3. Results and Discussion

3.1. Result

3.1.1. Respondent Characteristics Based on Age, Education, Parents' Occupation

Respondent characteristics based on age, education and parents' occupation can be seen in Table

1 below:

Table 1. Frequency Distribution Based on Age, Education, and Occupation of Parents at Kharis Kids Kindergarten

No.	Age of Parents	Frequency (f)	Percentage (%)
1.	21-30 Years	15	75
2.	>30 Years	5	25
	Total	**20**	**100**
No.	**Parents' occupation**	**Frequency (f)**	**Percentage (%)**
1.	Housewife	11	55
2.	Self-employed	9	45
	Total	**20**	**100**
No	**Parents' education**	**Frequency (f)**	**Percentage (%)**
1.	Elementary school	3	15
2.	Junior high school	4	20
3.	Senior high school	12	60
4.	S1	1	5.0
	Total	**20**	**100**

Source: Primary data, 2023

Based on Table 1, the majority of parents of children aged 21-30 years are 15 people (75%), and those aged >30 years are 5 people. In terms of parental occupation, the majority of respondents' parents are housewives, 11 people (55%) and parents who work as entrepreneurs are 9 people, while based on parental education, the majority of respondents have high school education, 12 people (60%), junior high school 4 people (20%), elementary school 3 people (15%), and 1 S1 person (5.0%).

3.1.2. Respondent Characteristics (Children) Based on Child Gender and Age

Characteristics based on gender and age of the child can be seen in the table below:

Table 2. Frequency Distribution of Respondents (Children) Based on Gender and Age of Children at Kharis Kids Kindergarten

No.	Gender of the child	Frequency (f)	Percentage (%)
1.	Female	9	45
2.	Male	11	55
	Total	**20**	**100**
No.	**Child age**	**Frequency (f)**	**Percentage (%)**
1.	60 months	7	35
2.	66 months	3	15
3.	72 months	10	50
	Total	**20**	**100**

Source: Primary data, 2023

Based on table 2, it shows that the majority of children's gender is male, as many as 11 people (55%), while based on the age of the child, the majority are 72 months old, as many as 10% of people, 66 months old, as many as 3 people (15%), and 60 months old, as many as 7 people (35%).

3.1.3. Child Development Values Before and After Being Given Grain Collage Media

The child's development values before and after being given seed collage media can be seen in the table below:

Table 3. Results of Child Development Frequency Before and After Being Given Collage Media Based on KPSP Score

No.	Developments before intervention	Frequency(f)	Percentage (%)
1.	Doubtful	13	65
2.	Appropriate	7	35
	Total	**20**	**100**
No.	**Development after intervention**	**Frequency (f)**	**Percentage (%)**
1.	Doubtful	2	10
2.	Appropriate	18	90
	Total	**20**	**100**

Source: Primary data, 2023

Based on Table 3, the results of the frequency of child development before the intervention, there are 13 children (65%) in the doubtful category and 7 children (35%) in the appropriate category, while child development after the intervention, there are 2 children (10%) in the doubtful category and 18 children (90%) in the appropriate category.

3.1.4. Data Normality Test

The results of the data normality test can be seen in the table below:

Table 4. Distribution of Data Normality Test Results

Variable	Frequency (f)	*Shapiro-Wilk*	
		Df	Sig.
Child development before intervention (*pre-test score*)	20	20	<,001
Child development after intervention (*post-test score*)	20	20	<,001

Based on Table 4, the results of the Shapiro-Wilk normality test after the pretest value is < 001 and the post-test value is < 001. This shows that the results of the data transformation are also not normally distributed, so the hypothesis testing uses a non-parametric test, namely the Wilcoxon test.

3.1.5. Children's Fine Motor Development Before and After Being Given Grain Collage Media

The results of the analysis of children's fine motor development before and after being given seed collage media can be seen in the following table:

Table 5. Results of Analysis of Children's Fine Motor Development Before and After Being Given Grain Collage Media

Use of grain collage media	Mean	Median	SD	Minimum	Maximum
Before using grain collage media	8.25	8.00	1.020	7	10
After using grain collage media	9.60	10.00	0.681	8	10

Source: Primary data, 2023

Based on table 5, it shows that the average value before using the grain collage media is 8.25, the median is 8.00 and the standard deviation is 1.020 with the lowest score being 7 and the highest being 10, while the average value after using the grain collage media increases with an average value of 9.60, a median of 10.00 and a standard deviation of 0.681 with the lowest score being 8 and the highest being 10.

3.1.6. The Effect of Using Grain Collage Media on Fine Motor Development

The results of the analysis of children's fine motor development before and after being given seed collage media can be seen in the following table:

Table 6. Results of the Influence of the Use of Grain Collage Media on the Development of Fine Motor Skills in 5-6 Year Old Children at Kharis Kids Kindergarten

Variable	Mean	SD	Minimum	Maximum	*Asymp.Sig*
Fine motor development before intervention	8.25	1.020	7	10	0,001
Fine motor development after intervention	9.60	0.681	8	10	

Source: Primary data, 2023

Based on Table 6, there is a significant influence on the development of fine motor skills of children aged 5-6 years at Kharis Kids Kindergarten before and after being given seed collage media, where the p-value is 0.001 (<0.01).

3.2. Discussion

The study demonstrated that the application of grain collage media positively affects the fine motor development of children. In general, the development of fine motor skills in children aged 5-6 years includes children being able to cut well, tie shoelaces, stick, recognize colors and children being able to use their fingers and wrists to move the tip of a pencil to write several letters and numbers (Anggraini, 2020).

The results of the assessment using the *KPSP* method at Kharis Kids Kindergarten showed that from 20 children aged 5-6 years before the intervention were given, 13 children were in the doubtful category (65%) and 7 children were (35%) in the appropriate category. Based on the *KPSP* assessment of children after being given the grain collage media intervention, there was an increase in development where out of 20 children, 18 children (90%) were categorized as appropriate but there were 2 children (10%) in the doubtful category. In the interpretation of the KPSP results, children who were said to be appropriate were those with a score of 9-10, doubtful 7-8, and deviations below 6 (Batlajery *et al*., 2021). The achievement of motor development or skills in children will also have an impact on other developments such as language, social skills and even self-confidence (Barbara, 2022).

Based on the study conducted, after the intervention was given there were still 2 children aged 60 months and 66 months with a doubtful category, from the researcher's observations using the *KPSP* assessment that there were gross and fine motor movements. In gross motor skills, children had a little difficulty jumping and standing on 1 leg without a partner, Later the children showed little interest in sketching as their fine motor skills developed

Hurlock states that a number of factors, such as the nervous system's development, physical capabilities, the child's motivation to move, a supportive environment, the child's psychological characteristics, age, gender, genetics, and chromosomal abnormalities, can affect a child's fine motor development (Masrifa, 2015).

In this study, there were 9 females (45%) and 11 males (55%) and while the majority of children were 72 months old, 10 children (50%), 66 months old, 3 children (15%), and 60 months old, 7 children (35%). In line with research conducted by Izzah & Chaizuran, it was stated that age and gender could affect children's fine motor development, where girls experienced motor development faster than boys. As age increases, fine motor development and play experience increase, especially eye and hand movement coordination (Izzah & Chaizuran, 2022).

Apart from internal factors such as parents' education and occupation, the stimulation given to children also greatly influences the child's progressive development (Dewi & Yulaika, 2019).

Based on Table 1, the development of children's fine motor skills can be influenced by factors such

as age, occupation and parental education. It was found that the majority of parents were aged 20-30 years, as many as 15 people (75%), worked as housewives, as many as 11 people (55%), and the majority had a high school education background, as many as 12 people (60%).

Research conducted by Warseno (2019) revealed that mothers who were of productive age (young) were more receptive to information than mothers who were no longer of productive age (more mature) because adults have had experiences that could influence thought patterns, making they difficult to change (Warseno, 2019). The last education that could be achieved was only up to high school or equivalent could be caused by the house being in a village far from the city coupled with insufficient economic conditions so that it would be difficult to continue school to a higher level (Warseno, 2019).

According to Kurniasari and Karina (2020) research, working mothers will meet more people, so they will get more information and their knowledge will increase. Work can develop professional knowledge and skills and learn, but the majority of housewives (IRT) have more time at home and time spent with children in monitoring their children's motor development (Kurniasari & Karina, 2020). This is consistent with the findings reported by Jelfita *et al.* (2021) revealed that working mothers got a score of 147 (39.00%) while mothers who did not work got an average score of 230 (61.00%), It appears that the fine motor skills of 5–6-year-old children with non-employed mothers are more advanced than those whose mothers are employed (Jelfita *et al*., 2021).

The statistical analysis revealed a significance value of 0.001 ($p < 0.05$), suggesting a notable effect of grain collage use on the fine motor development of children. These findings suggest that engaging in grain collage activities can foster improvements in fine motor skills among 5–6-year-old children identified with developmental delays or uncertain developmental status. Moreover, the outcomes of this research are consistent with the proposed hypothesis, confirming that grain collage media contributes positively to the enhancement of children's fine motor abilities.

Coordination of tiny muscles is a component of fine motor skills, especially when performing tasks that call for precise finger and wrist movements (Hasanah, 2021). Motor skills in children need to be trained so that they can develop properly. Early stimulation and intervention to improve fine motor intelligence abilities are carried out early according to their strengths and weaknesses (Dhita & Siti, 2017). Stimulation refers to actions or interventions designed to support children aged 0–6 in developing essential abilities, enabling them to achieve optimal growth and developmental progress (Izzah & Chaizuran, 2022).

Research conducted by Dewi *et al.* (2020) showed t count of 3.15 while the table was 2.04 with a significance level of 5% and db = 31, so it can be concluded that there is an influence of children's fine motor skills who are given collage activities (Dewi *et al*., 2020). Beginning with the most basic exercises, such as grain collage media activities, which include adhering grains to picture patterns to create a new collage piece and a complete shape, the activities are designed to help children develop their fine motor abilities (Herawati *et al*., 2023).

This research utilizes grain collage as a medium because such collage activities, which involve adhering grains onto patterned images, can effectively enhance children's fine motor skills. Supporting this, Maharani's study employing the Wilcoxon test reported a significant p-value of 0.002 (≤ 0.005), indicating a strong impact of grain collage media on fine motor development in children (Maharani, 2022). Similarly, research conducted by Afni *et al*. (2017) also found that using grain collage as a learning tool contributed positively to the advancement of children's fine motor abilities (Afni *et al*., 2017).

The researcher concluded that the activity of grain collage is important to be given to children aged 5-6 years to develop aspects of development according to the child's age, especially in the development of children's fine motor skills. It is because this media can stimulate children in coordinating between small muscles, hands, and fingers. In gross motor skills, children have a little difficulty in standing and

jumping using 1 leg or not in pairs, while children's fine motor skills lack interest in drawing. This is due to the lack of self-confidence in children in carrying out developmental stimulation activities and can also be influenced by parental work, age, and parental education.

4. Conclusion

There is a significant influence between the use of grain collage on fine motor development in children aged 5-6 years at Kharis Kids Kindergarten, Tanjung Gusta.

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