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The Effectiveness of Using Clay Media in Improving the Fine Motor Ability of Down Syndrome Children

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ABSTRACT

The purpose of this study was to determine the improvement of fine motor skills through Clay media in children with Down syndrome at Yayasan Melati Anak Bangsa Martapura. The approach used in this study is a quantitative approach with the type of SSR (Single Subject Research) research. The design used in this study is A1-B-A2, for A1 is the baseline phase 1, B is the intervention phase and A2 is the baseline phase 2 The data recording technique uses direct observation using magnitude data recording. The data analysis technique used is graphic visual analysis including analysis between conditions and analysis in conditions. The subjects of this study were children with Down syndrome at Yayasan Melati Anak Bangsa Martapura with the initials HT. The results showed that there was an increase in a positive direction in fine motor skills, it can be seen from the data obtained in the baseline 1 condition, the mean level was 27%, the intervention condition the mean level was 71.3%, and the baseline condition 2 had a mean level of 88%. The result of overlap from phase A1 to B is 0% and phase B to A2 is 0%. From these data, it can be concluded that the clay media used in this study can improve the fine motor skills of children with Down syndrome at Yayasan Melati Anak Bangsa Martapura.

Keywords: Clay Media, Fine Motor, Down Syndrome

INTRODUCTION

Humans are born with different conditions both physically, abilities and talents that they have. Some humans are born with special conditions that are different from children in general, so that they require more attention in providing a stimulus that is in accordance with the growth and development of the child. Different from children in general, children with special needs require special services according to their conditions (Mirnawati, 2020). Children with special needs are children who experience obstacles both physically and psychologically that affect their growth and development process compared to children in general. One of them is a child with Down syndrome, which is a condition in which a child experiences physical and intellectual barriers caused by an abnormality in chromosomal development.

Down syndrome is a genetic disorder caused by a change in the number of chromosomes which results in an individual having an excess of chromosome 21 (Yeni et al., 2019). This disorder is easy to recognize because children with Down syndrome have specific physical characteristics and their level of intelligence is usually below the average for children in general and is included in the mental retardation group. Children with Down syndrome have intelligence that is below the average child in general which has an impact

on motor skills (Primayana, 2020). Generally, children with Down syndrome have rough, stiff and weak fingers. This causes children with Down syndrome to experience difficulties in coordinating gross and fine motor skills (Pura & Asnawati, 2019).

Utami (2016) stated that fine motor skills are movements carried out by small muscles and only involve certain body parts. Movement in fine motor requires careful hand and eye coordination. Fine motor skills are important skills for every individual, including children with Down syndrome (Aguss, 2021; Kalsum et al., 2021). This ability is needed to help children's abilities in non-academic and academic fields. Fine motor skills in the non-academic field are related to the self-development abilities of children with Down syndrome which are very important in daily activities (Amka & Mirnawati, 2022). Self-development that involves fine motor skills including eating, drinking, self-care, bathing and dressing. Then, in the academic field includes children's activities at school which require children to use their fine motor skills such as cutting, drawing and writing.

The results of observations made at the Melati Anak Bangsa Martapura Foundation showed that there were children with intellectual disabilities, namely children with Down syndrome class VII of junior high school who experienced obstacles in their fine motor skills and ultimately had an impact on non-academic activities, one of which was self-development ability. The impact of children's fine motor skills in the academic field can be seen from when the child is asked to hold a pencil, the child's hand is still stiff and takes a long time to move the pencil. When a child connects the dotted line on a piece of paper, the child is still unable to connect the dotted line correctly. This can be seen from the results of the lines made by the child that are not in accordance with the direction and come out past the dotted line. This has an impact on children's activities in the academic field which require children to write and see the condition of children who are in class VII Junior High School which requires children to do more activities related to fine motor skills.

Efforts made by the foundation in the form of providing media to train fine motor skills of children with Down syndrome such as providing lego block toys and children are asked to arrange toys into various shapes. Meanwhile, the efforts made by parents at home to train fine motor skills of children with Down syndrome by asking children to clean up their own toys after each game. From the various efforts made by foundations and parents, they still do not make progress in the development of children's fine motor skills. Until now, children still experience stiffness in their hands and children still cannot move a pencil properly and correctly.

Given that fine motor skills are very important in supporting daily activities, the researcher offers a solution to this problem, namely the provision of clay media that has never been used by children with Down syndrome before to train their fine motor skills. Clay or clay is a medium that can be used to develop children's creativity and fine motor skills. Clay or clay can improve hand and eye coordination, it can help children develop fine motor nerves in playing activities and children can also move their fingers to train concentration and patience.

As research conducted by Rifdiastuty, et al (2015), regarding the use of clay media as a tool to improve fine motor development, it was stated that the use of flour clay media was to see the effect of increasing the fine motor development of preschoolers. Based on the research conducted, the results were an increase in fine motor skills that occurred due to giving clay therapy to children. The differences in this study are the subjects used and the materials made from clay.

In line with research conducted by Mufida, et al (2018) using clay media as a tool to improve fine motor development. Researchers used paper clay media as a medium to improve the fine motor development of children in Kindergarten Dharma Wanita Tosaren II. Based on the results of the research conducted, it can be seen that children who were previously still stiff in writing and moving pencils, after being given paper clay media, have started to be able to write and move their fingers flexibly. The differences in this study are the subjects used and the materials made from clay. Based on the description above, the researcher is interested in conducting research with the title "Use of Clay Media in Improving Fine Motor Skills for Children with Down Syndrome at Yayasan Melati Anak Bangsa Martapura".

METHOD

The approach used in this research is a quantitative approach with the type of SSR (Single Subject Research). The design used in this study is A1-B-A2, for A1 is baseline phase 1, B is the intervention phase and A2 is baseline phase 2. The data recording technique used in this study uses direct observation and data recording used is magnitude or referred to as the recording of event data. The data analysis technique used is graphical visual analysis including analysis between conditions and analysis within conditions. The subjects of this study were children with Down syndrome at Yayasan Melati Anak Bangsa Martapura with the initials HT.

RESULT AND DISCUSSION

1. Baseline 1 (A1)

This study began by determining the initial conditions from the results of observing fine motor skills in subjects as measured through writing activities before being given intervention at baseline 1 (A1). Data collection as many as 4 sessions taken at the child's residence. The results of the first baseline observation are to see the child's behavior towards fine motor skills by looking at the results of the child's writing on the dotted line writing test sheet.

Table 1 Ability at baseline stage 1 (A1)

Session	*Time*	*Score*	*Mark*	*Percentage*
1	2×60	23	$\frac{23}{80} \times 100\% = 28{,}75\%$	29%
2	2×60	22	$\frac{22}{80} \times 100\% = 27{,}5\%$	28%
3	2×60	21	$\frac{21}{80} \times 100\% = 26{,}25\%$	26%
4	2×60	20	$\frac{20}{80} \times 100\% = 25\%$	25%

Based on the results of data at baseline 1 (A1) in the first session to the fourth session, in the fine motor test in writing activities children are asked to write horizontal, vertical, right oblique, left oblique lines, horizontal curves, vertical curves, horizontal zig-zags, zig -vertical zags, semicircles, vowels, and numbers 1-5. From these activities it can be seen that during the research carried out at baseline stage 1 (A1) there were 4 sessions and the data obtained on the subject's fine motor skills in session 1 obtained a score of 23 with a percentage of 29%. In the 2nd session the subject obtained a score of 22 with

a percentage of 28%. In the 3rd session the subject obtained a score of 21 with a percentage of 26%. In the 4th session the subject obtained a score of 20 with a percentage of 25%.

Based on observations from the writing activities that have been carried out by HT, it can be concluded that the child's ability in fine motor skills has not increased significantly. Children need a long time to write because their fingers are still stiff when holding a pencil.

2. Intervention (B)

The intervention was carried out to the subject by showing the clay media subject which contained fine motor activity in the form of squeezing, shaping, pressing, printing and cutting clay. Then, the subject was given an explanation on how to use the clay media and the subject carried out activities according to the directions. The activities carried out include children being asked to hold the clay media, squeeze the clay media by hand, press the clay media using a clay roller, print the clay media using a printing tool, and cut the clay media using a cutting tool. In addition, the subject imitated the coloring process of clay media using acrylic dyes and imitated various shapes such as balls, cylinders, rectangles, circles, zig-zag lines and curved lines. At this intervention stage, the researcher implemented 6 sessions so that it was hoped that the subject could improve his fine motor perceptual abilities, especially in writing activities.

When carrying out the intervention, children's motor skills were sufficiently capable of carrying out each activity using clay media independently. Researchers only direct children and children will imitate what is done by researchers. It can be seen that the child is able to hold the clay media and the tools used to shape the clay. Other activities such as pressing ball shapes using hands and roller clay, squeezing clay media by hand, printing, cutting, and sculpting children's shapes are also quite capable. So it can be seen that children can carry out fine motor activities in clay media independently and can only follow directions from researchers. As for the results of the observation data to see the subject's fine motor skills on clay media by using a fine motor test in the form of writing activities.

Table 2 Ability at the intervention stage (B)

Session	***Time***	***Score***	***Mark***	***Percentage***
5	2×60 menit	53	$\frac{53}{80} \times 100\% = 66{,}25\%$	66%
6	2×60 menit	53	$\frac{53}{80} \times 100\% = 66{,}25\%$	66%
7	2×60 menit	59	$\frac{59}{80} \times 100\% = 73{,}75\%$	74%
8	2×60 menit	59	$\frac{59}{80} \times 100\% = 73{,}75\%$	74%
9	2×60 menit	59	$\frac{59}{80} \times 100\% = 73{,}75\%$	74%
10	2×60 menit	59	$\frac{59}{80} \times 100\% = 73{,}75\%$	74%

Based on the intervention data, it can be concluded that there was an increase in the fine motor skills of the subject after being given treatment using clay media, namely in the 5th session the subject obtained a score of 53 with a percentage of 66%. In the

6th session the subject obtained a score of 53 with a percentage of 66%. In the 7th session the subject obtained 59 results with a percentage of 74%. In the 8th session the subject obtained 59 results with a percentage of 74%. In the 9th session the subject obtained 59 results with a percentage of 74%. In the 10th session the subject obtained 59 results with a percentage of 74%. Thus, it can be concluded that the fine motor skills in the intervention (B) subject experienced an increase and it can be seen from graph 4.2 that there was a significant increase in sessions 5 and 7. The study was continued at baseline stage 2 (A2).

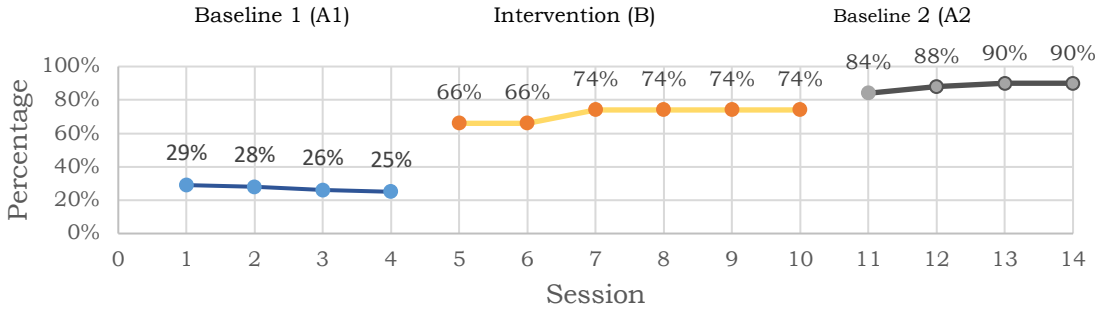
3. *Baseline* 2 (A2)

The researcher gave 6 sessions of intervention and then continued to baseline 2. This baseline has the aim of being a comparison to baseline 1 where the subject experienced an increase in fine motor skills on clay media after being given the intervention (B). baseline stage 2 (A2) was carried out in 4 sessions. Baseline 2 (A2) observation results to see children's behavior towards clay media by seeing the desired behavior occur in children.

Table 3 Ability at baseline stage 2 (A2)

Session	***Time***	***Score***	***Mark***	***Percentage***
11	2×60 menit	67	$\frac{67}{80} \times 100\% = 83{,}75\%$	84%
12	2×60 menit	70	$\frac{70}{80} \times 100\% = 87{,}5\%$	88%
13	2×60 menit	72	$\frac{72}{80} \times 100\% = 90\%$	90%
14	2×60 menit	72	$\frac{72}{80} \times 100\% = 90\%$	90%

Session eleven subjects no longer used clay media and subjects were asked to return to work on fine motor tests in the form of writing activities without prior treatment as was done at the intervention stage. The results showed that in the 11th session, the subject got a score of 67 with a percentage of 84%. In the 12th session, the subject got a score of 70 with a percentage of 88%. In the 13th session, the subject got a score of 72 with a percentage of 90%. And in the last session, namely the 14th session, the subject got a score of 72 with a percentage of 90%. Thus, it can be concluded based on the results of the data at baseline 2 (A2) that the subject experienced an increase from the previous stage without the addition of clay media.



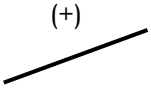
Graph 1 Graph of comparison of fine motor skills of children with Down syndrome at baseline 1, intervention, and baseline 2 stages

Graph 1 shows the child's fine motor skills are increasing, as can be seen from the visualization of graph 4.4, at baseline stage 1 (A1), at first the child seems to still have difficulty directing the pencil to adjust the line so that many lines do not match the dotted line so the child only gives a score of 29%, 28%, 26% and 25%. After being given intervention (B) using clay media and being given treatment, the children's abilities experienced an increase as seen in the fifth and seventh sessions the children responded by 66% and 80%. Then at baseline stage 2 (A2), the child's fine motor skills experienced a significant increase in the eleventh, twelfth, and fourteenth sessions as shown in the graph, the child gave a response of 84%, 88% and 90%.

4. Analysis in Conditions

The length of the condition can be seen from the number of data points in each phase. The length of the conditions in this study at baseline 1 was 4 sessions, the Intervention stage was 6 sessions, and baseline 2 was 4 sessions. The trend direction in the baseline phase 1 (A1) decreased (-). In the intervention phase (B) the trend toward increasing (+). Baseline phase 2 (A2) the direction trend is increasing (+). The trend of stability is between 85% -100%, it can be said that the data is stable. In this study, the percentage trend for stability is 100%, which means that the data is stable. Trace data in the baseline phase 1 (A1) decreased, the intervention phase (B) and baseline phase 2 (A2) increased. The level of stability and range of fine motor skills of children with Down syndrome in baseline phase 1 (A1) is stable with a range of 29% - 25%. In the intervention phase (B) it was stable with a data range of 66% - 74%, and the baseline phase 2 (A2) was stable with a data range of 84% - 90%. The level of change in fine motor skills of children with Down syndrome at baseline 1 from each session was (-) 4% (decreased) and at the intervention stage there was an increase in gain of (+) 8% (improved). At baseline stage 2, there was another increase with an increase in the child's fine motor skills by (+) 6% (improved).

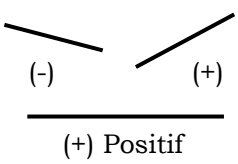
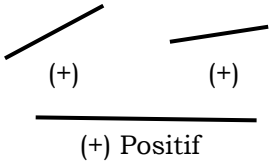
Table 4 Results of Visual Analysis in Conditions

No	***Condition***	***Baseline 1 (A1)***	***Intervention (B)***	***Baseline 2 (A2)***
1	Condition Length	4	6	4
2	Directional Trend Estimation	(-) 	(+) 	(+)
3	Stability Trends	Stable (100%)	Stable (100%)	Stable (100%)
4	Data Trace	(-) 	(+) 	(+)
5	Level Stabilitas dan Rentang	Stable 29%-25%	Stable 66%-74%	Stable 84%-90%
6	Change Levels	29%-25% (-) 4%	66%-74% (+) 8%	84%-90% (+) 6%

5. Analysis between Conditions

The number of variables in the baseline 1 phase to the intervention was 1 and from the intervention to baseline 2 was 1. Changes in direction and their effects were taken from the data in the analysis under conditions. From these data it can be seen that there is an increase in the positive direction between sessions. Changes in stability between conditions can be seen from the effect of the intervention on the subject. At baseline stage 1 to the intervention the results showed stable to stable and at the intervention stage to baseline 2 the results showed stable to stable. Changes in level can be seen from the data points of the last session in the phase with the initial data points of the next phase, so that (+) 41% was obtained from baseline 1 to intervention and (+) 10% from the intervention phase to baseline 2. The percentage of overlap that occurs in ability fine motor skills of children with Down syndrome in the baseline 1 and intervention phase was 0% and in the intervention phase and baseline 2 was 0%. Sunanto (Yuwono, 2018) said that if the percentage of overlap is small, the better the effect of intervention in a study on the target behavior you want to change.

Table 5 Analysis Between Conditions

No	***Comparison of Conditions***	***A1/B***	***B/A2***
1	Number of Variables	1	1
2	Changes in Direction and Effects	 (+) Positif	 (+) Positif
3	Stability Change	Stabil ke stabil	Stabil ke stabil
4	Level Change	(+)41%	(+)10%
5	Overlap Percentage	0%	0%

Based on the results of the data analysis that has been done, it can be seen that the fine motor skills of children with Down syndrome at baseline stage 1 (A1) are still low. In the baseline phase 1, there were 4 sessions with a mean level of 27%. The researcher saw the results of the dotted line written by the subject independently. It can be seen that during the baseline 1 (A1) process, the child's fingers were still stiff when moving the pencil and it took quite a long time to make a line. The child is able to hold a pencil using his fingers. However, when moving and directing it is still quite difficult for children.

One of the causes of low fine motor skills in children with Down syndrome is due to the intellectual barriers experienced by children with Down syndrome and the lack of stimulation given to children. Nurlaili (2019) explained that intellectuality in children greatly influences the development of children's fine motor skills by looking at the Intelligence Quotient score. From this it can be concluded that brain development can affect children's movement abilities and the function of the brain itself, namely to control and regulate a movement which is coordination between the brain, nerves, and muscles (Uffi Al'azmi, 2022; Wandi & Mayar, 2019) . This is supported by research conducted by Sacks & Sandy (Irwanto et al, 2019) which has provided evidence that children with Down syndrome have obstacles in processing information received by the nerves to coordinate it into a movement.

Intervention (B) was carried out continuously for 6 sessions which obtained a mean level of 71.3%. The child's ability in the intervention phase increases because the child is given continuous training in intervention activities (B) using clay media. The researcher saw the results of the dotted line written by the subject independently. It can be seen that when the Intervention process (B) was carried out, the child's fingers began to move properly when moving the pencil and needed faster time than baseline phase 1 (A1) to make a line.

Peningkatan yang terjadi pada anak disebabkan oleh pemberian intervensi (B) menggunakan media *clay*. Hal ini didukung oleh penelitian yang dilakukan oleh Rifdiastuty, dkk (2015) yang melakukan penelitian menggunakan *clay* tepung, penelitian tersebut menunjukkan adanya peningkatan pada kemampuan motoric halus subjek dalam penelitian ini. Peningkatan yang terjadi pada subjek dikarenakan pemberian intervensi menggunakan *clay* yang terbuat dari tepung. Penelitian yang serupa mengenai penggunaan *clay* dengan jenis *paper clay* juga dilakukan oleh Mufida & Abu (2018), menyatakan bahwa permainan *paper clay* yang diberikan kepada anak usia 4-5 tahun di TK Dharmawanita Tosaren II memberikan pengaruh pada peningkatan motorik halus anak. Peneliti menyatakan bahwa permainan *paper clay* dapat mengembangkan motorik halus anak karena dalam permainan tersebut terdapat aktivitas yang dapat menstimulus kemampuan motorik halus anak (Hasibuan & Info, 2023; Kalsum et al., 2021).

In the baseline phase 2 (A2) a mean level of 88% was obtained. In the baseline phase 2 (A2), 4 sessions were carried out, namely to find out the child's fine motor skills after being given an intervention (B). The researcher saw the results of the dotted line written by the subject independently. It can be seen that when the baseline phase 2 (A2) is carried out, the child's fingers begin to move properly when moving the pencil and it takes a shorter time than the previous phase to make a line. It can be seen from the percentage of fine motor skills of children with Down syndrome, which shows an increase in fine motor skills compared to baseline 1 (A1). In line with the opinion of Nurlaili (2019), which states that the more stimulation a child is given, the more influence it will have on the development of fine motor skills.

CONCLUSION

Based on the results of the research and discussion, it shows that there is an increase in a positive direction in fine motor skills. This can be seen from the results of the data obtained by the subject during baseline phase 1 (A1) with a mean level of 27%. In the next phase, namely the intervention phase (B) with a mean level of 71.3%. Finally, in the baseline phase 2 (A2) the subject got a mean level of 8%. Then for the results on the overlap from A1 to B as much as 0% and B to A2 as much as 0%. Based on these data it can be concluded that the use of clay media is effective in improving fine motor skills in children with Down syndrome (HT) at the Melati Anak Bangsa Martapura Foundation.

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