Collage Games Increase the Duration of Concentration in Children with Intellectual Developmental Disorder

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ABSTRACT: Concentration is an important ability for children, especially the skill to focus attention on specific objects. Field observations show that children with intellectual developmental disorders often experience difficulties maintaining concentration during learning activities. This research aims to determine the effect of collage games on increasing learning concentration in children with intellectual developmental disorders. The hypothesis states that collage games can improve concentration duration before and after the intervention. The study used a single-subject experimental method with an A-B-A design. Baseline 1 (A-1) consisted of four 15-minute sessions in which the child-colored pictures of balls. The intervention phase (B) involved eight 15-minute sessions using collage games. Baseline 2 (A-2) was then conducted through four 15-minute coloring sessions. The instrument used was direct observation with event recording, measuring pre-test and post-test concentration duration and frequency. Observations were carried out by a psychology graduate therapist across sixteen sessions in total. Data were analyzed using graphic analysis by comparing concentration duration in each session and calculating the average scores for Baseline 1, Intervention, and Baseline 2. The results showed that the collage game intervention had a positive effect on increasing concentration duration in children with intellectual developmental disorders. This is demonstrated by the scores obtained: Baseline 1 (24), Intervention (17), and Baseline 2 (25). There was a noticeable increase from Baseline 1 to Baseline 2. Thus, collage games are effective for improving children's concentration during learning activities.

INTRODUCTION

In the learning process, children need concentration. Therefore, every child participates in the learning process at school with the hope of being able to concentrate well (King et al., 2016). Concentration is the focus of attention on the mind or a high level of attention to something, or focusing attention on a particular object (Ahmad & Febriana, 2010). A child's ability to concentrate will affect the speed at which they grasp the material presented by the teacher. A child who has a good ability to concentrate will be quicker to grasp the material presented by the teacher during the learning process than students with poor concentration skills (Gilson & Carter, 2016). In today's fast-paced digital and information era, the challenge of maintaining children's concentration is becoming increasingly complex (Anida & Wahiddin, 2019).

According to Ahmad & Frebiana (2010), concentration disturbances are caused by various factors, including a distracting environment, high academic pressure, lack of adequate rest, and mental and physical health problems. Therefore, it is important for parents and educators to understand effective strategies and methods to help improve children's concentration by providing a supportive environment, ensuring sufficient rest, engaging children in challenging and stimulating activities, and recognizing their special needs. This is crucial for developing strong concentration skills to achieve their maximum potential in learning and daily life (García-Redondo et al., 2019).

Factors affecting concentration in children with Intellectual Developmental Disorder (IDD) include a friendly physical environment with minimal distractions, which can play a role in creating a calm and focused atmosphere. A well-organized learning space, free from external disturbances such as noise or too-bright lights, can help children focus better on tasks or activities (Anida & Wahiddin, 2019).

Additionally, the difficulty level of tasks or activities tailored to the child's abilities also plays a significant role. Tasks that are too easy may not sufficiently stimulate the child's concentration, while tasks that are too difficult can cause frustration and disrupt focus (Alverson et al., 2019). Therefore, it is important to provide tasks that match the child's ability level so that they feel encouraged to concentrate and complete the tasks well. The support and guidance provided by adults also have a significant impact on the concentration of children with Intellectual Developmental Disorder (Qian et al., 2020). Children need appropriate and understanding guidance from adults to help them overcome challenges and stay focused on their goals. Emotional support and motivation also enhance children's concentration in daily activities (Nader-Grosbois et al., 2013).

Deficits in intellectual abilities, such as reasoning, problem-solving, planning, abstract thinking, judgment, as well as academic learning and experiential absorption, can be identified through clinical evaluation and standardized individual intelligence tests. Inabilities in adaptive capabilities that result in failure to meet cultural standards for social independence and social responsibility are also a significant part of this picture (Alverson et al., 2019). Without adequate support, these adaptive function deficiencies can affect an individual's ability to perform daily activities, such as communicating, participating socially, and living independently in various environments like home, school, workplace, and community (Baragash et al., 2020).

Various types of interventions have been researched to improve concentration in children including creative play therapy, music play therapy, and play therapy with colors and shapes (Vereenooghe et al., 2017) Creative play therapy, such as collage making, allows children to express themselves artistically by selecting and arranging various materials to create unique artworks. This creative activity can stimulate children's imagination, enhance fine motor skills, and help them focus on the task at hand (Qian et al., 2020).

Play therapy with colors and shapes is also one of the interventions that can improve children's concentration. This activity involves the creative introduction and exploration of colors and shapes, which can stimulate the visual part of the brain and help children pay attention to fine details (Alverson et al., 2019a). By playing with colors and shapes, children can practice their observation and concentration skills in a fun and interactive way. Through these various interventions, it is hoped that children with Intellectual Developmental Disorder can develop better cognitive skills and focus, as well as improve their adaptability in daily activities (Nader-Grosbois et al., 2013). With a holistic and diverse approach in intervention, children can have enjoyable and beneficial learning experiences to enhance their quality of life, one of which is through collage making.

In collage, various materials such as pieces of paper, photos, fabric, stickers, or other materials are rearranged and glued onto media like paper, canvas, or other materials (Vereenooghe et al., 2017). The collage process allows someone to combine different visual elements and create unique and interesting artworks.

In collage art, creativity plays a key role in creating unique and interesting works. The process starts with selecting a variety of materials, from paper pieces, photos, fabric, to recycled materials. After the materials are selected, the next step is to cut the materials according to the desired shape and size. Then, with meticulous attention, these materials are arranged and glued onto the chosen media (Qian et al., 2020). Experimenting with various arrangements and compositions is an integral part of creating engaging collage art. The collage process is not just about randomly arranging materials, but also involves an artistic touch and imagination. Additional details such as painting, decorations, or textures can be added to enrich the collage work (Vereenooghe et al., 2017). By combining various elements, collage creates a unique and captivating visual harmony. Moreover, the collage process can be done traditionally by hand using physical materials, or digitally with the help of graphic design software.

In collage play, individuals can not only express their creativity but also develop their artistic and imaginative abilities. Each collage work is a reflection of each individual's imagination and uniqueness, making it an attractive and captivating form of art (Alverson et al., 2019). Collage play can be a beneficial form of intervention or activity for children with Intellectual Developmental Disorder, relating to the development of children experiencing Intellectual Developmental Disorder, including (Nader-Grosbois et al., 2013), (1) Material Selection: The process of choosing materials to be used in collage can help children practice decision-making and problem-solving, which in turn strengthens their concentration, (2) Creative Process: Arranging and designing a collage requires planning and organized thinking. Through this process, children learn to organize their ideas and follow certain steps, which can help improve their concentration endurance, and (3) Provided Time: Providing sufficient time to complete a collage allows children with Intellectual Developmental Disorder to focus on their tasks without excessive time pressure. This helps them learn to manage time and concentration more effectively.

Collage play has been shown to have various positive impacts on the development of children with Intellectual Developmental Disorder (IDD), as mentioned in research by Bumble et al. (2019). First, collage play provides children with Intellectual Developmental Disorder the opportunity to express their creativity through art. They can explore various materials and colors and create unique artworks according to their imagination, which can increase their sense of accomplishment and self-appreciation. Moreover, the process of cutting, arranging, and gluing materials in collage play can also help improve children's fine motor skills. This is important for the development of eye-hand coordination and fine muscle strength, which are crucial aspects of motor development in children.

Collage play also provides cognitive stimulation for children with Intellectual Developmental Disorder. They can stimulate their cognitive abilities, such as problem-solving, pattern recognition, and spatial concept understanding. The process of finding patterns, arranging elements, and making creative decisions can help train their brains in critical and creative thinking (Bumble et al., 2019). Additionally, through collage play, children can feel valued for their abilities and creativity, which can enhance their sense of independence and self-confidence. Seeing the art they proudly create can provide a positive boost for children in developing self-esteem and belief in their abilities. Lastly, collage play can also enhance the social interaction of children with Intellectual Developmental Disorder. This fun activity can motivate children to socialize with others, especially through collaboration in creating artworks. Through cooperation and communication in collage play, children can learn social skills and improve their ability to interact positively with others. Therefore, collage play can be an effective means to support the holistic development of children with Intellectual Developmental Disorder (Bumble et al., 2019).

This study uses subjects with IDD because these subjects have experienced concentration problems during the learning process, such as difficulties in paying attention to school tasks, listening to instructions, and focusing on schoolwork like homework, art, and writing assignments. The

subjects also have difficulty reading attentively and are easily distracted. Based on information from parents, teachers, and the results of observations and interviews, researchers suspect that the subjects experience developmental disorders, with a provisional diagnosis of Intellectual Developmental Disorder with concentration problems and epilepsy.

In the research method, the selection of these subjects is important to understand how interventions with collage play can help improve concentration in children with Intellectual Developmental Disorder. By understanding the characteristics and challenges faced by the subjects, researchers can design appropriate and effective interventions to help subjects overcome the concentration problems they experience. Subjects were selected based on their characteristics, showing below-average intelligence levels in the mild category and difficulties in academic work such as reading and writing. This research can provide valuable insights into developing appropriate intervention strategies for children with IDD who experience concentration problems.

The alternative hypothesis is based on the assumption that collage games, as an intervention, will improve the concentration of children with IDD (Alverson et al., 2019a). Collage games provide sensory stimulation through the use of various materials such as paper, colors and different textures. This stimulation can increase the focus and concentration of children with IDD because it triggers attention to the objects used in the collage. Support for this hypothesis can be found in related research showing that sensory stimulation can improve concentration in children with learning difficulties.

Research Objectives and Hypothesis

This research is an experiment that aims to evaluate whether collage game intervention can improve concentration in children with Intellectual Developmental Disorder through a cause-and-effect relationship. A group of children with Intellectual Developmental Disorder will be given a collage game intervention, while the other group will be a control group without intervention. The children's concentration was measured before and after the intervention to see the changes that occurred. Thus, this study was designed to directly test the effect of a collage game intervention on concentration, taking into account various factors that might influence the results. Hypothesis: Collage games can improve concentration in children with Intellectual Developmental Disorder because there is a causal relationship between the intervention and behavior changes, so it is acceptable.

METHODS

Design

This research applies the Single Subject Research (SSR) method, which is a type of experimental research that uses a single subject to evaluate the impact of a particular treatment. According to Sunanto, et al, (2005) Single Subject Research or single subject research, namely an experimental research method to determine the magnitude of the influence of treatment given repeatedly on behavior that you want to change within a certain time. According to Arikunto, (2006) states that experimental design is research to determine whether or not there is 'something' imposed on the subject. The study used an A-B-A design (Sunanto, et al, 2005), which involved administering treatment, removing treatment, and administering treatment again to assess its effect on a single subject. The treatment given is in the form of a collage game with the aim of increasing the concentration of children who experience intellectual developmental disorder. The A-B-A design (Sunanto, et al, 2006) was used to examine the cause-and-effect relationship between the dependent variable (child concentration) and the independent variable (collage game treatment) which can be seen in Figure 1.

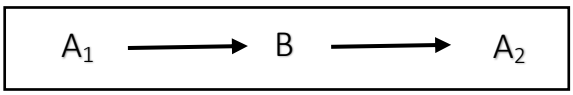


Figure 1. Research Design

Explanation:
A1 = Baseline 1, the condition of the research subject's ability to concentrate before the intervention. Conducted in 4 sessions
B = Intervention, intervention conditions given to research subjects by implementing a collage game. Conducted in 8 sessions
A2 = Baseline 2, the condition of the research subject's abilities after the intervention. Conducted in 4 sessions

Participants

The subject of this study was a boy with Intellectual Developmental Disorder Class I at a private school in Semarang. The subjects were selected based on the criteria for children with Intellectual Developmental Disorder by looking at the results of a psychological assessment which showed an IQ = 76. This child was chosen because the child had problems concentrating during the learning process. And the class teacher recommended the child to be a research subject.

To obtain participant consent for the study, the researchers first arranged a meeting with the child's parents or legal guardians to explain the purpose of the study, the procedures involved, and the reasons for selecting their child. They provided a detailed explanation of the study's aims, duration, methods, and any potential risks or benefits, emphasizing the confidentiality and anonymity of the data collected. The parents were presented with a written consent form, which included a summary of the study, the voluntary nature of participation, the right to withdraw at any time, details about confidentiality and data protection, and contact information for the researchers and an ethics committee. The researchers allowed the parents to ask questions and ensured they fully understood the information provided. Once all questions were addressed, and the parents felt fully informed, they were asked to sign the consent form and were given a copy for their records. Additionally, depending on the child's level of understanding, the researchers obtained assent from the child by explaining the study in simple terms and ensuring the child agreed to participate.

Measurement

Measurements in this study were carried out for 16 consecutive days (baseline 1, intervention, baseline 2) for 15 minutes after the child came home from school (12.00-12.15). Measurements are carried out by recording directly by observing the duration of the child's concentration. (Sunanto, et al., 2005). The duration of children's concentration is recorded by a Bachelor of Psychology. Measurements were carried out at the subject school.

Intervention Stages

Based on the research results of Simanjuntak & Mulyadripana (2012), there are several stages of collage game intervention consisting of 16 sessions, each session lasting 15 minutes:

Table 1. Intervention Stage

Stage	Notes
First Baseline (A-1):	a. The first baseline was carried out on the first – fourth day. b. Conducted after school hours from 12.00-12.15 c. The place of implementation is in the classroom without teacher assistance and the class is quiet without any students in the classroom d. Subjects were asked to complete the task of coloring a picture of a ball within 15 minutes. e. While the subject is coloring pictures of balls, practice counting with a stopwatch and record the frequency of concentration per five seconds while doing the coloring task for 15 minutes.

	f. If the subject stops doing the coloring task, the frequency of concentration is not counted g. First baseline for four sessions h. The first baseline was carried out on the first – fourth day i. Conducted after school hours from 12.00-12.15 j. The place of implementation is in the classroom without teacher assistance and the class is quiet without any students in the classroom k. Subjects were asked to complete the task of coloring a picture of a ball within 15 minutes l. While the subject is coloring pictures of balls, practice counting with a stopwatch and record the frequency of concentration per five seconds while doing the coloring task for 15 minutes. m. If the subject stops doing the coloring task, the frequency of concentration is not counted
Intervention (B)	a. Intervention for eight sessions b. Intervention was carried out on the fifth – twelfth day. c. Conducted after school hours from 12.00-12.15 d. The place of implementation is in the classroom without teacher assistance and the class is quiet without any students in the classroom e. Subjects were asked to prepare glue that would be used to attach folded pieces of paper to a picture. f. Subjects carried out the instructions given to practice attaching folded pieces of paper to a picture and then were given 15 minutes. g. Practice counting with a stopwatch and recording the frequency of concentration per five seconds while working on a collage assignment for 15 minutes. h. If the subject stops working on the collage task, the frequency of concentration is not counted. i. When the child successfully completes, practice giving a reward in the form of a high five or praise.
Second Baseline (A-2)	a. Second baseline for four sessions b. The second baseline was carried out on the thirteenth – sixteenth day. c. Conducted after school hours from 12.00-12.15 d. The place of implementation is in the classroom without teacher assistance and the class is quiet without any students in the classroom e. Subjects were asked to complete the task of coloring a picture of a ball within 15 minutes. f. While the subject is coloring pictures of balls, practice counting with a stopwatch and record the frequency of concentration per five seconds while doing the coloring task for 15 minutes. g. If the subject stops doing the coloring task, the frequency of concentration is not counted.

Intervention Package

The intervention package for the collage game designed to increase the duration of concentration in children with Intellectual Developmental Disorder includes a variety of materials and structured content. The materials needed for the collage game consist of colored papers, old magazines, child-safe scissors, glue sticks, markers, and thematic stickers. Each collage is centered around specific themes that align with the child's interests and learning objectives, such as animals, nature, household objects, or geometric shapes. The collage activity requires the child to cut out images or shapes from magazines or colored papers and assemble them creatively on a blank sheet, promoting engagement and focus.

To effectively conduct the intervention, facilitators need to possess competencies in special education, particularly in working with children with Intellectual Developmental Disorder. They

should have a strong understanding of child development, patience, and the ability to provide clear, step-by-step instructions. Skills in creating an encouraging and supportive environment are essential, as is the ability to adapt activities to suit the child's individual needs and maintain their interest. Facilitators should also be proficient in arts and crafts to guide the collage-making process effectively and provide positive reinforcement to enhance the child's concentration and self-esteem throughout the activity.

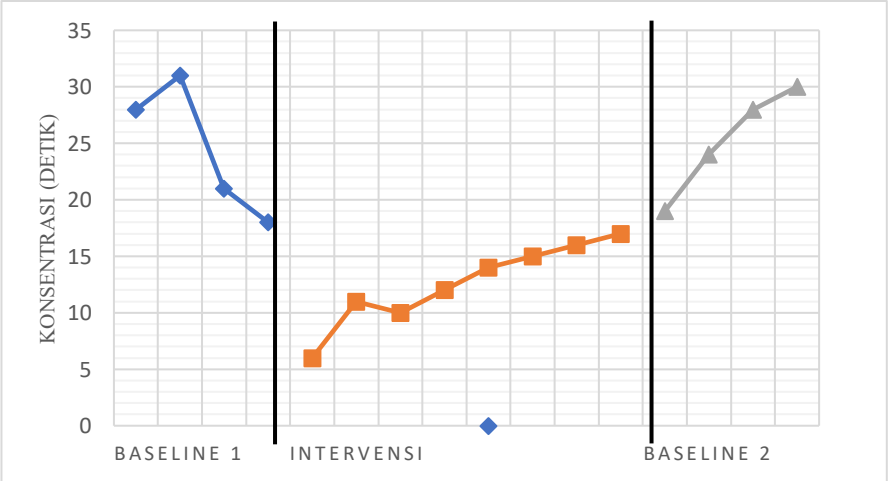
Data analysis

Analysis of this research data was carried out using graphic analysis. The measurement data used is the subject's concentration duration in each session, and the average score of concentration duration for baseline 1, intervention and baseline 2.

RESULTS AND DISCUSSION

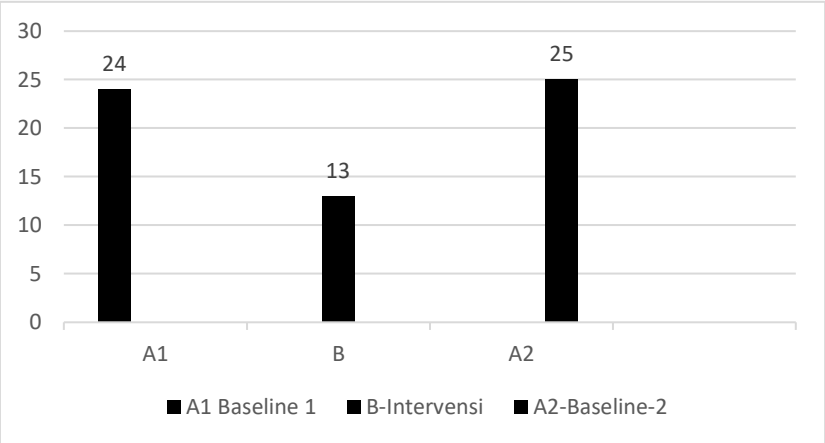
Results

The results of research with the target behavior of increasing concentration in children with intellectual developmental disorders with collage game treatment. Data obtained from research results with data collection for 16 sessions consisting of 4 baseline-1 sessions (A1), 8 intervention sessions (B), and 4 baseline-2 sessions (A2) (Sunanto, et al. 2005) can be explained in In the measurements of this study, it shows that there is an average score for the duration of the subject's concentration in the A-B-A design from the results of data analysis for baseline 1, intervention and baseline 2. (Sunanto, et al., 2005).



Graph 1. Subject Concentration (seconds) in 15 minutes

The results on the subject's concentration graph, which was carried out in 15 minutes, show the score data in (seconds) for each session. The first baseline was carried out for four sessions which was a pre-test or before the intervention was carried out. The intervention was carried out over eight sessions as a therapy method. The second baseline was carried out for four sessions as a post-test or after the intervention was carried out.



Graph 2. Average subject concentration duration score

The above graph represents the average concentration duration scores of subjects obtained from data for each session. The first baseline is the average pre-test score (before the intervention) and the average post-test score (after the intervention).

Discussion

The test results above, with graphical analysis, show an increase in concentration duration before (baseline 1) and after (baseline 2) the intervention. The average concentration duration score of subjects at baseline-1 is 24 and baseline-2 is 25, meaning the hypothesis is accepted. This implies that the collage game intervention can increase concentration duration before and after the intervention in children with Intellectual Developmental Disorder because there is a causal relationship between the intervention and the change in concentration duration.

This study supports the research by Kim & Lee (2021) which states that the motivation to improve concentration for children with intellectual disabilities is by continuously conducting collage play training. The results before and after the cognitive training program based on collage play are statistically significant and show superiority compared to conventional programs.

In the context of learning theory, collage games support the concept of using creative activities such as stimulating cognitive functions, including concentration, in children with intellectual developmental disorder (Anida & Wahiddin, 2019). Collage games also emphasize the consistency of concentration duration and patience. In its application, collage games also support learning theories that highlight the importance of repetition and practice in habit formation and behavior change (Vereenooghe et al., 2017b). This is supported by the research of Mulyadiprana, A. and Simanjuntak, F. R. (2011) which shows an increase in concentration duration before and after the collage game intervention in children with Intellectual Developmental Disorder, from baseline-1 of 50.75 to baseline-2 of 99.8.

Children with Intellectual Developmental Disorder often experience difficulties in concentrating on learning which affects their academic performance, consequently lowering their quality of life. They experience obstacles and delays in their ability to concentrate on learning. One effort to improve the learning concentration of children with Intellectual Developmental Disorder is through fine motor stimulation with educational games, such as collage games (Suratmi, 2018). This is supported by the research of Heny. N, (2018) on collage play therapy for the concentration of special needs children in inclusive schools, showing a positive impact on pre-test and post-test scores with a strong correlation, achieving an average score of 70.3. Additionally, the research of Febriana (2009) shows an increase in concentration ability frequency after the intervention from baseline-1 (A-1) to baseline-2 (A-2) by 48.75. This data indicates that concentration ability increases after using the

appropriate game, which is collage games, with criteria that subjects sit quietly, concentrate on paying attention and listening to lessons, do not look around, and keep their hands still during the learning process.

Therefore, this study has similarities and differences with some previous research results. The similarities with previous research are the method used is a single-subject experiment with an A-B-A design, subject criteria, and research instruments with pre-tests and post-tests. What distinguishes it is the subject's situational factors during the intervention that affect the score results before and after the intervention.

During the baseline-1 phase, conducted over four meetings, the implementation time was after school hours from 12:00-12:15. Subjects were asked to color pictures to be completed. The subjects were interested in coloring because they could express themselves with the available colors. The subjects' condition was good, they did not complain much, were willing to follow instructions, and completed tasks well. Thus, the recorded concentration duration (in seconds) within 15 minutes was quite good and stable.

During the intervention phase, conducted over eight meetings, the implementation time was after school hours from 12:00-12:15. Subjects were asked to play collage games by following instructions to stick small pieces of paper onto a picture. During this task, subjects experienced a decrease in concentration. This intervention required good concentration and precision in every movement of sticking onto a picture. Subjects felt bored, stopped to rest, got tired of completing tasks, wanted to go home, and desired to play with friends in the schoolyard. Thus, a decrease in the subjects' concentration duration was observed, occurring during the intervention process.

During the baseline-2 phase, conducted over four meetings, the implementation time was after school hours from 12:00-12:15. Subjects were asked to color pictures. The subjects' condition was good to follow instructions, although they felt tired due to school hours and wanted to play with their friends. Thus, in the second baseline, there was an increase in the subjects' concentration duration.

Overall, the study results show that the collage game intervention is effective in increasing concentration duration before and after the intervention in children with Intellectual Developmental Disorder. Although results indicate an increase in concentration duration from baseline-1 to baseline-2, this study has some limitations that need to be considered. One is the lack of control over external factors that can affect the subjects' concentration, such as time, conditions, and the environment where the study was conducted. The possibility of fatigue in subjects is also a factor to consider, as subjects might become bored or experience burnout during intervention sessions. Despite these weaknesses, the results show that collage games are effective in increasing the concentration duration of children with Intellectual Developmental Disorder. The hypothesis based on the collage game intervention in this study aligns with previous research. However, it is important to note that the effects of the intervention may vary depending on the characteristics, situations, conditions of the subjects, and methods used. Therefore, further research with appropriate timing procedures and better control is needed to validate these findings. It is also important to consider the practical implications of this study. Integrating collage games into special education programs can provide an attractive and effective alternative to increasing the concentration duration of children with Intellectual Developmental Disorder.

Thus, this study provides additional insights into how collage game interventions can positively impact increasing concentration duration before and after in children with Intellectual Developmental Disorder gradually and consistently.

Recommendations for Further Researchers

The research can be carried out in the morning when the subject’s concentration is optimal or in the afternoon after the child has taken a nap. Future studies are advised to first observe the child’s

condition throughout the school day to determine the most appropriate time and place for implementing the intervention. Researchers can also provide rewards that the child prefers to increase motivation during the intervention process. In addition, future research may expand the scope and deepen understanding of collage game interventions in improving concentration among children with Intellectual Developmental Disorder. It is also important to explore the factors that influence intervention effectiveness, such as individual child characteristics and the environmental context. Finally, comparing collage games with other intervention methods is recommended to identify the most effective approach for enhancing concentration in children with Intellectual Developmental Disorder.

CONCLUSION

Based on the research results, it can be concluded that this research hypothesis is accepted. The A-B-A study design showed that increases in concentration duration occurred before and after the intervention period. Thus, the main conclusion of this study is that the collage game intervention is effective in increasing the duration of concentration before and after in children with Intellectual Developmental Disorder. This shows the great potential of collage games as a useful approach in managing concentration in this population.

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