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The Effectiveness of Guided Play in Improving Selective Attention among Children with Down Syndrome Aged 6 to 15 Years at the Psycho-Pedagogical Center for Children with Intellectual Disabilities in Remchi District, Tlemcen

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Abstract

This study aimed to assess the effectiveness of a therapeutic program based on guided play in improving selective attention among children with Down syndrome aged 6 to 15 years. For this purpose, a quasi-experimental pretest-posttest design was used to test the study hypothesis. The sample consisted of 12 children with Down syndrome aged 6 to 15 years, including six males and six females, selected through purposive sampling. Their levels of intellectual disability ranged from moderate to mild. Data were collected through direct observation, a guided interview, and administration of the Stroop Test to assess the level of selective-attention difficulties in the study sample. After the results were collected and statistically analyzed, the findings indicated that the guided-play program was effective in improving selective attention among children with Down syndrome. Accordingly, the study recommended adopting guided play as a strategy in educational and rehabilitation programs for children with Down syndrome, training educators in its implementation, and providing appropriate educational resources and materials in specialized educational institutions.

Keywords: Guided play; selective attention; Down syndrome; intellectual disability; quasi-experimental approach.

1. Introduction

Selective attention is a fundamental cognitive process that enables an individual to focus on a specific stimulus in an environment containing multiple competing stimuli. In children with Down syndrome, selective attention may be an area of particular difficulty, affecting their ability to interact appropriately with their environment. Compared with other children, children with Down syndrome may have greater difficulty ignoring irrelevant stimuli and maintaining attention on the primary task (Al-Khafaf, 2015, p. 55).

Children with Down syndrome may experience severe, profound, or moderate intellectual disability, which can negatively affect the development of logical, analytical, and experiential abilities (Lambert, 1979, p. 57). Fusby described this group of children as performing poorly in group-based operations and problem-solving tasks. This was attributed to delayed responding compared with typically developing children and to difficulty stabilizing attention rapidly. In contrast, typically developing children may provide anticipatory responses without detailed examination of the stimuli. B. La Brune also indicated that impaired concentration and attention may hinder recall in these children (Lambert, 1979, pp. 57-58).

Many researchers have examined the role of attention in information processing and its relationship with other cognitive processes. Sensation, attention, and perception have been described as forming a linear sequence that begins with sensation, followed by attention and then perception. Several explanatory models emerged from this perspective and became known as selective-attention or filtering models, which seek to clarify the role of attention in information processing (Adnan, 2012, pp. 96-97).

Play occupies an important place in the lives of children with Down syndrome and is considered an important means of improving conditions associated with disability and modifying undesirable behaviors. It also enables children to explore and learn through their senses. Children, in particular, interact more effectively when they are understood; as communication and mutual understanding increase, so do the child's engagement, willingness to learn, and opportunities to acquire new skills (Al-Huwaidi, 2012, pp. 43-44). Its importance can be summarized as follows:

- It helps develop language and communication skills.
- It enhances problem-solving ability and adaptation to new situations.
- It improves fine and gross motor skills.
- It supports social interaction and independence (Mahmoud, 2007, p. 21).

Guided play is an important educational and psychological activity, particularly for children with special needs. It contributes substantially to the development of cognitive, linguistic, motor, and

social abilities by providing a safe and structured environment that promotes interaction, concentration, and learning (Al-Basit, 2015, p. 54).

Attention-deficit disorder is among the most prevalent disorders in children, particularly school-aged children. Indicators of the disorder may be observed at an early age before school enrollment, although formal diagnosis is not made until after the age of seven. Several studies estimating its prevalence have reported rates of between 3% and 5% among children worldwide (Salem, 2009, p. 34). In Arab countries, prevalence has been estimated at between 6% and 12% among children in the Arab world (Salem, 2009, p. 34). This prevalence increases when a child also has physical, intellectual, or cognitive disabilities such as Down syndrome.

Selective-attention difficulties among children with Down syndrome and approaches to addressing them have been examined by several researchers, including Hashani Imani, who conducted a study at the Psycho-Pedagogical Center in Biskra in 2018. The study investigated the effectiveness of educational play in developing intelligence among children with Down syndrome at the center. It concluded that play had an effective role in the development of these children and that the use of educational play at the Biskra psychological center was moderate (Iman, 2018, p. 37).

- Asia Addawi (2018), in a study entitled "The Relationship between Selective Attention and the Visuospatial Sketchpad in Children with Down Syndrome," reported that weaker performance was associated with poorer results on an active-memory test. The study used a sample of five cases and adopted an experimental method (Asia, 2018).
- MikdadIbtissam and MechriAicha conducted an applied study in a primary school in Oum El Bouaghi using the Stroop Test with a sample of four children with Down syndrome. The study aimed to assess these children's attentional abilities (Asia, 2018).

Taken together, these studies suggest that selective-attention difficulties among children with Down syndrome can substantially hinder the acquisition of knowledge and academic information and increase the difficulties they experience in daily and school life. They also indicate that guided play therapy may play an effective role in developing cognitive abilities and helping children adapt, particularly to school-related demands. However, these studies did not establish statistically significant differences in selective-attention difficulties according to sex, age, or socioeconomic variables, nor did they precisely identify the level of such difficulties among children with Down syndrome. Accordingly, the present study addresses the following questions:

2. Research Problem, Questions, and Hypotheses

2.1. Research Questions

1. To what extent is guided play effective in improving selective attention among children with Down syndrome at the Psycho-Pedagogical Center for Children with Intellectual Disabilities in Remchi, Tlemcen?
2. Are there statistically significant differences in the effectiveness of the program according to the child's sex and age?

2.2. Research Hypotheses

- The guided-play program has a positive effect on selective attention among children with Down syndrome.
- There are statistically significant differences in program effectiveness according to the child's sex and age.

3. Objectives and Significance of the Study

3.1. Objectives of the Study

3. Determine the effect of guided play on improving selective attention among children with Down syndrome.
4. Compare the extent to which children with Down syndrome respond to guided-play programs and identify the factors affecting their success.
5. Provide practical recommendations for educators and specialists at the center on the use of play as a therapeutic and educational tool to help children with Down syndrome improve their cognitive and attentional abilities.

3.2. Significance of the Study

- The importance of selective attention among children with Down syndrome.
- The limited number of studies addressing the application of therapeutic programs for children with Down syndrome in the local community.
- Contributing to the scientific literature by encouraging further research on children with Down syndrome, who constitute a particularly vulnerable population.
- Practical significance: using a quasi-experimental method to test the research hypotheses and examine findings in relation to previous studies.
- The importance of applying the heart-based therapeutic program.
- The importance of the Stroop Test and its effectiveness in measuring the level of attention among children with Down syndrome.

4. Methodology

4.1. Research Design

The experimental method was selected because it was considered the most appropriate for answering the study questions and testing the hypotheses. A pretest-posttest experimental design was adopted. An experimental group of children with Down syndrome was selected, and their level of selective-attention difficulties was measured. The experimental treatment was then implemented through a guided-play program. Finally, selective attention was measured again, and the mean pretest and posttest scores were compared.

4.2. Research Setting and Population

The Psycho-Pedagogical Center for Children with Intellectual Disabilities in Remchi opened on December 1, 1987. The center serves 61 children, including 27 residential children, 28 semi-residential children, and day attendees. Children are distributed across the following units: the special TR21 unit, the pre-vocational unit, the awareness unit, the stimulation unit, the autism unit, and the preschool unit.

The center is staffed by educational personnel, speech therapists, clinical psychologists, medical and paramedical personnel, and administrative staff.

4.3. Study Sample

A purposive sample was drawn from the study population and consisted of 12 children with Down syndrome, both boys and girls, aged 6 to 15 years. Their levels of intellectual disability ranged from severe to moderate and mild.

Table 1. Characteristics of the Study Sample

Variable	Category	Number of Children	Percentage
Age	5-10 years	7	66.55%
Age	10-15 years	5	33.33%
Sex	Male	6	50%
Sex	Female	6	50%
Intellectual level	Mild	4	33.3%
Intellectual level	Moderate	8	66.6%
Social level	High	7	58.33%
Social level	Low	5	41.65%
Type of residence	Residential	5	41.66%
Type of residence	Semi-residential	7	58.33%

4.4. Sample Characteristics

As shown in Table 1, the sample is distributed relatively evenly across age, sex, intellectual level, social level, and type of residence, thereby reflecting diversity in personal and social characteristics. The exception is age: eight participants are aged 5-10 years and four are aged 10-15 years.

With respect to intellectual level, eight children were classified at the moderate level and four at the mild level. Thus, the majority of the sample was classified at the moderate level.

4.5 Data-Collection Instruments

The data-collection instruments consisted of observation, interview, and the Stroop Test (attention test), designed by John Ridley Stroop and modified by Gorden.

4.5.1. Direct Observation

Direct observation was used to examine the children's behavior across the three main stages of the study:

- the pretest stage, the experimental-treatment stage, and the posttest stage.
- The observations included the nature of the children's responses to the Stroop Test.
- Children's behavior during individual activities was also observed.

4.5.2. Interview

Individual interviews were used to administer the test to participants, while group interviews were used to implement the therapeutic program.

Semi-structured interviews were used at the beginning of test administration and during the initial phase of the therapeutic program, whereas structured interviews were used during implementation of the therapeutic program.

These interviews were conducted under the supervision of the two researchers at a rate of two interviews per week, with each interview lasting 45 minutes. Interviews took place in the classroom; individual interviews associated with administration of the Stroop Test were conducted in the psychologist's office because the test required the child to be alone and free from distractions.

The interview procedure involved preparing the child for the interview, conducting the main interview activities, and then preparing the child for the end of the interview.

4.5.3. Stroop Test

4.5.3.1. Definition of the Stroop Test

The Stroop Test measures selective attention and cognitive inhibition in children and adolescents aged 8 to 15 years. It was designed by John Ridley Stroop in 1935 and later modified in 1978 by C. J. Gordon (Jaallab, 2021, p. 260). The test is intended to assess selective attention and the inhibitory control required when two alternative responses compete.

4. Psychometric Properties Of The Test

With regard to its psychometric properties, the test has good validity and reliability. According to Louzai's 2008 study, test-retest reliability coefficients over a 15-day interval ranged from 0.86 to 0.99 across the four test tasks. These coefficients indicate strong test-retest reliability (Dalila Jaghlool, 2022, p. 368).

The test was adapted to the Algerian context by Saad Abdelaziz (2009-2010) as part of a Master's dissertation in psycholinguistics and cognitive psychology. He translated the words on the cards and the instructions into Arabic and subsequently evaluated the psychometric properties of the test (Jaallab, 2021, p. 261).

4.5.3.3. Test Administration Conditions

6. Time required: the examinee is allowed 45 seconds to respond to each card.
7. The researcher must ensure that the examinee has adequate vision. If reading glasses are normally worn, they must also be worn during the test.
8. The examinee should not be allowed to remove the glasses or engage in any behavior that could interfere with readability, particularly in the fourth part of the test. If an error is identified, the examinee must reread each incorrectly read word but is not required to reread the entire line.
9. The examinee must be able to read and name colors.

4.5.3.4. Test Materials

- Card 1: contains 50 color words printed in black.
- Card 2: consists of 50 color words printed in red, green, yellow, and blue.
- Card 3: contains 50 colored rectangles in green, blue, red, and yellow.

4.5.3.5. Administration Procedure

10. First, the child is shown Card 1 and asked to read the color names printed in black from right to left, line by line. Reading stops after 45 seconds, and the number of words read is recorded.

11. Second, the child is shown Card 2 and asked to read from right to left until 45 seconds have elapsed.
12. Third, the child is shown Card 3 and asked to name the colors shown in the small colored rectangles from right to left. The task stops after 45 seconds, and the number of colored items named is recorded.
13. Fourth, the child is shown the card and asked to identify the print colors of the names from right to left. The task stops after 25 seconds, after which the scores are analyzed to the fifth (Jaallab, 2021, p. 261).

4.5.3.6. Scoring Procedure

The researcher should have four cards available containing the different responses expected from the examinee for each card. Errors and hesitations are monitored and marked, and the results are transferred to a scoring sheet containing the examinee's personal information, the errors made, and the number of correct responses for each card.

The error score for each card is then calculated as follows: number of errors $\times$ 2 + number of hesitations. The interference score is subsequently calculated by subtracting the correct-response score on Card (3)C, which concerns color naming, from the correct-response score representing interference in naming the ink colors in which the words are written on Card (2)B.

4.6. Statistical Analysis

The arithmetic mean and standard deviation were calculated for both the pretest and posttest to assess selective attention among children with Down syndrome. A t-test was also used to examine within-group differences between pretest and posttest measurements and differences in the effectiveness of the program in improving selective attention.

5. Results

I. Presentation of Pretest Results

The pretest was conducted in a classroom at the pedagogical center containing tables, a board, toys, numbers, pictures, educational posters, and educational floor mats. Construction toys were among the main types of guided-play materials available in the room.

The pretest procedure began by bringing the child from the classroom, after obtaining the educator's approval, and accompanying the child to the therapy room. Upon entering the room, the child was seated on a chair facing the two researchers and was psychologically prepared for the test.

The researchers spoke with the child about preferred activities and interests, entertained the child, and offered praise.

The test was then presented to the child, and its nature, objectives, and the responses required for each test card were explained.

Overall, the children accepted the test and made a considerable effort to respond to the researcher's questions. However, two children showed fear and hesitation about entering the room, which required additional encouragement and reassurance, including the use of reinforcers such as sweets.

The pretest sessions lasted between 40 and 45 minutes and were conducted mostly in the morning.

5.2. Pretest Results

Table 2. Pretest Results

Participant	Score	Mean	Standard Deviation	Total
1	39	9.83	16.072	118
2	02	9.83	16.072	118
3	21	9.83	16.072	118
4	-4	9.83	16.072	118
5	00	9.83	16.072	118
6	00	9.83	16.072	118
7	-3	9.83	16.072	118
8	7	9.83	16.072	118
9	21	9.83	16.072	118
10	35	9.83	16.072	118
11	10	9.83	16.072	118
12	14	9.83	16.072	118

As shown in Table 2, the participants' Stroop Test scores ranged from 0 to 39 and varied across the sample, with an arithmetic mean of 9.83 and a standard deviation of 16.072.

5.3. Experimental Intervention

The experimental treatment was implemented through a color-based program designed to increase attention. The program comprised four psychological sessions for each child. These sessions are summarized below as observations covering all participants.

5.3.1. Phase One: Establishing Acceptance of the Trainer

The objective was to help the child become comfortable with and accept the trainer.

To attract the child's attention, reinforcers such as sweets were used, after which the researchers began playing with the child using the child's favorite toy. During these sessions, most children responded positively to playing with the researcher, repeatedly requesting that the activity be repeated and throwing balls into the basket. Two participants, however, showed hesitation and refusal to engage in play with the researcher because they displayed behavioral difficulties such as stubbornness and refusal to attend school within the center, despite receiving additional reinforcers.

5.3.2. Phase Two: Identification of the Color Red

The objective was for the child to recognize the color red. The session lasted approximately 25 minutes, during which the researchers placed a set of balls in front of the child and asked the child to identify the red color. Most children did not succeed, which required the session to be repeated at closely spaced intervals.

5.3.3. Phase Three: Recognition of the Color Red through Play

The objective was again for the child to recognize the color red, this time through a game in which the child was asked to flap their hands upon noticing the color red. Approximately half of the children succeeded, while the remainder either hesitated or made errors, requiring the researchers to add one or two sessions.

5.3.4. Phase Four: Sorting and Classification Activity

The objective was to teach recognition of the color red through participation in a game with the researcher. The child was asked to sort red balls from balls of different colors and place them in a red basket.

A larger number of children succeeded in this activity, with the exception of the two previously mentioned children who displayed stubborn behavior.

5.4. Posttest Results

The posttest was administered approximately two months after the experimental treatment under conditions similar to those of the pretest in terms of setting, sample, and measures. The results are shown in the following table:

Table 3. Posttest Results and Score Calculations Using SPSS

Participant	Score	Mean	Standard Deviation	Total
1	22	13.41	16.220	161
2	0	13.41	16.220	161
3	10	13.41	16.220	161
4	0	13.41	16.220	161
5	-4	13.41	16.220	161
6	-1	13.41	16.220	161
7	2	13.41	16.220	161
8	5	13.41	16.220	161
9	27	13.41	16.220	161
10	33	13.41	16.220	161
11	20	13.41	16.220	161
12	47	13.41	16.220	161

As shown in Table 3, posttest results continued to vary across participants but showed a noticeable improvement compared with the pretest. The total score was 161, with an arithmetic mean of 13.41 and a standard deviation of 16.220.

5.5. Assessment of Data Normality

The normality of the data distribution was examined using the Shapiro-Wilk test in SPSS. The results were as follows:

Table 4. Normal Distribution of the Data

Measurement	Total	Degrees of Freedom	Statistical Significance
Pretest	118	12	0.161
Posttest	161	12	0.130

As shown in Table 4, the degrees of freedom for both the pretest and posttest are 12, while the statistical significance values are 0.161 for the pretest and 0.130 for the posttest. Both values are greater than 0.05. Accordingly, the null hypothesis is rejected and the alternative hypothesis is accepted; therefore, the data are normally distributed.

5.6. Comparison between Pretest and Posttest Scores

The difference between pretest and posttest scores was examined using a paired-samples t-test in SPSS. The results are presented in Table 5:

Table 5. Difference between Pretest and Posttest Measurements

Measurement	Sample	Mean	Standard Deviation	t-test	Statistical Significance
Pretest	12	9.85	16.07	0.84	0.043
Posttest	12	13.41	16.22		

As shown in Table 5, the t-test value is 0.84 at a statistical significance level of 0.43, which is lower than 0.05. Accordingly, the alternative hypothesis stating that there are statistically significant differences between the pretest and posttest results is accepted.

6. Discussion

The research hypothesis stated that the guided-play program would be effective in improving selective attention among children with Down syndrome at the Remchi Pedagogical Center in Tlemcen.

The hypothesis was examined using an experimental method with a pretest-posttest design. Mean selective-attention scores were measured using the Stroop Test, and pretest and posttest means were compared using a paired-samples t-test.

The findings of the present study are consistent with several previous studies, including "The Effect of Play Therapy on Improving Attention among Children with Intellectual Disabilities" by Abdullah et al. (2016), as well as a study examining the effect of guided play therapy on improving attention levels.

Guided play contributed to improving selective attention among participants by enhancing the children's ability to focus on multiple messages at the same time.

In learning the color red, guided play helps the child perceive it through several sensory pathways, including vision, hearing, and touch.

The interaction among these different contexts can be explained on the basis of late-selection theory. According to this theory, exposure to multiple stimuli results in a large amount of information entering memory; following processing, some information is selected while other information is not. The selected information constitutes the focus of the individual's attention and provides the basis for responses to different situations in the surrounding environment.

In the case of a child with Down syndrome, learning the color red through play in several contexts and through repeated learning processes may enable the child to select, at a later stage, some of the information that has entered the mind and to attend to it as a result of the activities experienced during the sessions.

However, because intellectual disability is characterized in part by weaknesses in long-term memory, the persistence of this selected information may be limited. The information may fade after the child discontinues treatment for a period of time, potentially leading to difficulty recalling the color red.

7. Conclusion

This study focused on a particular group within society that has received considerable attention in recent years: children with Down syndrome, one of the more prevalent syndromes.

In light of the findings of the study, guided play was shown to constitute an effective educational tool for improving selective attention among children with Down syndrome.

It contributed to the children's ability to concentrate, reduce distraction, and increase interaction with their educational and social environment.

The study showed that play can be used not only as a means of entertainment but also as a planned educational tool aimed at developing the cognitive and behavioral skills of children with special needs and enhancing their opportunities for integration into school life.

The study encountered several difficulties that affected the research process to varying degrees. The most prominent were as follows:

14. Sample-related difficulties: the children differed in their levels of cognitive and attentional ability.
15. Difficulty implementing the program: motivating the children and maintaining their concentration during play sessions was challenging because of rapid distractibility or limited ability to follow instructions continuously.
16. Limited specialized local references: difficulty was encountered in identifying previous Arabic-language studies that addressed guided play among children with Down syndrome.

8. Recommendations and Suggestions

17. Adopt guided play as a strategy in educational and rehabilitation programs for children with Down syndrome because of its effectiveness in improving attention and concentration skills.
18. Train educators and psychologists working with this population to implement guided-play activities in accordance with the children's specific abilities.
19. Integrate guided play into an individualized plan for each child.

20. Provide appropriate educational resources and educational games in special-education institutions.

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