

# Effectiveness of a Psycho-Supportive Training Program Based on Play Activities in Developing Some Cognitive Skills in Children with Autism Spectrum Disorder.

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## Abstract

This study aimed to investigate the effectiveness of a psycho-supportive training program based on play activities in developing some cognitive skills in children with autism spectrum disorder (ASD). The study was conducted at the Psycho-Pedagogical Center in Mostaganem, Algeria. The main tool of the study was the psycho-supportive training program based on play activities designed by the researcher, as well as the Adel scale for diagnosing ASD, the Raven intelligence test, and the cognitive skills test. The study sample consisted of 6 children with ASD, who were divided into two groups: an experimental group of 3 children who received training on the program, and a control group of 3 children who did not receive training on the program. The study results showed that the psycho-supportive training program based on play activities effectively developed some cognitive skills in children with ASD.

**Keywords:** Psycho-supportive training program, play activities, cognitive skills, children with (ASD) autism spectrum disorder.

## 1. Theoretical Framework of the Study:

Autism spectrum disorder (ASD) is a condition that affects brain development and how a person interacts with others. It can cause difficulties in social interaction and communication and in repetitive and restricted behavior patterns. The term "spectrum" in ASD refers to a wide range of symptoms and levels of severity. ASD includes previously considered separate conditions, such as autism, Asperger syndrome, childhood disintegrative disorder, and one of the unspecified pervasive developmental disorders. Some individuals still use the term "Asperger syndrome," which is generally believed to be on the mild end of the autism spectrum (Ayada, 2018, p 2).

Autism spectrum disorder (ASD) begins in early childhood and can eventually cause problems at the level of social performance in school and work. For example, ASD symptoms often appear in children within the first year of life. Normal growth appears to occur for a small number of children in the first year, and then they go through a period of regression between the ages of 18 and 24 months when they develop ASD symptoms. While there is no cure for ASD, early intensive intervention can make a significant difference in the lives of

many children and significantly affect their cognitive functions, for cognitive functions, more than 70% of children with autism spectrum disorder (ASD) have low intellectual abilities that sometimes reach the limits of intellectual disability, and sometimes reach moderate and severe intellectual disability. And that 10% of them show high abilities in limited aspects, such as memory, calculation, music, and art, or they show repetitive mechanical abilities without comprehension. Studies indicate that cognitive disorders are the most distinctive features of autism, due to the resulting difficulties in social communication and emotional response to the environment. (Ayada, 2018, p 2)

Since attention, understanding, perception, language, and imagination are among the most important cognitive functions that are affected by their disruption, autistic children suffer from clear thinking disorders. According to some studies, also, three to four out of three children with ASD have a degree of retardation. These children may show disorders in attention, perception, hyperactivity, and loss of interest in tasks. This was shown by several studies, such as the study of Joseph (2006), the study of Merin (2006), and the study of Gille (2013), (Daoudi and Tawinat, 2021, pp. 275-276).".

Autistic children suffer from a disorder in concentration, attention, and visual and verbal communication. Linguistic development may be slow or completely absent. There are non-verbal autistics and verbal autistics who use words with unfamiliar meanings, or communication through signs instead of words. Not to mention the error in using pronouns and the inability to form correct sentences. They may repeat as a result of their lack of understanding of language. For example, when asked "What is your name?" they may reply "What is your name?".

In addition to their poor social relationships, autistic children are unable to express their feelings and emotions. They have a disorder in understanding the feelings of others and interacting with them, or they interact inappropriately, such as being aggressive, destructive, or disruptive. They do not enjoy being around others, even children of their age do not share their interests or play with them.

Autistic children also suffer from sensory problems. Their response to physical sensations is unusual. They may be unusually sensitive to light, sound, and touch. Despite this, they do not care about pain or heat. They may be more active than usual or have less movement than usual. They perform repetitive movements, such as swinging, spinning, or flapping their hands. There are also episodes of abnormal behavior (such as hitting their head against a wall) without a clear reason. They may insist on keeping something, thinking about a particular idea, or being attached to one person in particular. Autistic children also lack spontaneous, innovative, or imaginative play. They do not imitate the movements of others. They may be fascinated by an object or activity with unnatural enthusiasm or focus. (Medra, 2019, p1)

As we know, young children generally learn a lot through play. We can see that typically developing children build their physical and social skills through play. Play allows them to experience different characters from their nature and meet a large group of friends. However, we can observe that children with autism play in completely different ways from typically developing

children. They play alone, even repeating the same game without purpose and refusing to renew. Therefore, we often see children with autism isolated and immersed in their solitude, unable to explore their abilities and interests on their own. Play therapy is an important tool to help children with autism become more aware and complete. It can also be seen as an important tool to help parents enhance their effective connection with their children. (Al-Drebat, 2019, no page)

The current study relies on some play activities that help children with autism spectrum disorder (ASD) develop some of their cognitive skills. The most important technique that will be used is play through composition, analysis, and sequencing, as it is, in our opinion, the most exciting and flexible style for children that is appropriate for their age group, in reducing aggressive behavior in children.

The play activity that the autistic child practices does not stop its limits and benefits at achieving physical and motor development, but goes beyond to achieve goals related to cognitive and emotional development, learning life skills, and learning social adaptation skills such as communication skills. Therefore, the goal of special education programs for children with ASD should be to prepare them so that each child can take his place in the world in which he lives socially and economically, and to train himself to benefit from his abilities and information to the highest possible degree of efficiency. Through our current study, we wanted to know the effectiveness of a psychological training program based on play activities to develop some cognitive skills in this category, and we raised the following questions:

- *What is the effectiveness of a psychological training program based on play activities in developing some cognitive skills in children with autism spectrum disorder (ASD)?*

This question can be broken down into two sub-questions:

- *Are there any differences between the control group and the experimental group in cognitive skills after the program is applied?*
- *Are there any differences between the pre-test rank averages and the post-test rank averages of the experimental group members on the cognitive skills scale?*

## **1.2 Hypotheses:**

- A psychological training program based on play activities is effective in developing some cognitive skills in children with autism spectrum disorder (ASD).

This hypothesis can be broken down into two sub-hypotheses:

- There are differences between the control group and the experimental group in cognitive skills after the program is applied, in favor of the experimental group.

- There are differences between the pre-test rank averages and the post-test rank averages of the experimental group members on the cognitive skills scale, in favor of the post-test.

### 1.3 The Objectives of the Study:

This study aims to achieve the following:

- ❖ To ensure the effectiveness of a psychological training program based on play activities in developing some cognitive skills in children with autism spectrum disorder (ASD).
- ❖ To identify the difference between the control group and the experimental group in cognitive skills after the program is applied.
- ❖ To identify the difference between the pre-test rank averages and the post-test rank averages of the experimental group members on the cognitive skills scale.

### 1.4 The Importance of the Study:

The importance of the study lies in the psychological care of children with autism spectrum disorder (ASD) and helping them to develop their cognitive skills through a play activities program.

### 1.5 Operational concepts:

- **1.5.1 Psychological training program:** It is a psychological training program based on play activities, consisting of (12) sessions, in which a set of play activities are applied, represented in drawing, music, sequencing, assembly, and matching, which were applied to a sample of children with mild autism spectrum disorder, where the session lasted from 45 minutes to 60 minutes in a room equipped with the necessary tools for play activities.
- **1.5.2 Play activities:** They are a set of play activities designed by the researcher to develop some cognitive skills in children with mild autism spectrum disorder, based on the child's age, level of mental and cognitive development, and the content of his academic program at the center. These activities are: drawing, music, sequencing, assembly, and matching.
- **1.5.3 Children with autism spectrum disorder:** They are children who are diagnosed as suffering from autism spectrum disorder as a result of a neurodevelopmental disorder at the brain level, and this is what is measured by the scale applied in our study, and its score is limited to (0-28) degrees.

- **1.5.4 Cognitive skills:** These refer to the skills related to the cognitive side, represented in attention, perception, and memory, and it is measured through the processes of assembly, sequencing, and matching, and are what is measured by the scale applied in our study, and its score is limited to (35-175) degrees.

## 1.6 Limitations of the Study:

- **1.6.1 Spatial boundaries:** The current study was conducted at the Psycho-Pedagogical Center in Mostaganem Province.
- **1.6.2 Temporal boundaries:** The field study was conducted during the 2021/2022 academic year.
- **1.6.3 Human boundaries:** The study sample consisted of (06) children with mild autism spectrum disorder who were selected purposefully, and divided into two groups: a control group of (03) members who did not receive training on the program, and an experimental group of (03) members who received training on the program.

## 2. Field study:

### 2.1 Exploratory study:

**2.1.1 Place and duration of the exploratory study:** The exploratory study was conducted at the Psycho-Pedagogical Center in Mostaganem Province, from the academic year (2021/2022) from 15/09/2021\_22/12/2021.

**2.1.2 Sample of the exploratory study:** The study sample consisted of (10) children with mild autism spectrum disorder.

### 2.1.3 Tools of the Exploratory Study:

#### 2.1.3.1 Autism Spectrum Disorder Scale by Adel Mohamed:

- **Definition of the scale:** It is a scale developed by Adel Mohamed, consisting of (28) items that measure autism spectrum disorder in children. It is answered using the following responses: (yes, no), corrected sequentially: (1,0). The item scores are added together to give the total score, so the highest score that the examinee can obtain on this scale is (28) points, and the lowest score is (0) points, and the child is considered to have mild autism spectrum disorder if he scores less than (10) points.
- **Psychometric properties of the scale:** The psychometric properties of the scale were calculated for validity using marginal comparison validity, where it was found to distinguish between low-performing and high-performing individuals. Its validity was also calculated using internal consistency between each item and after, where the

correlation coefficients were found to be between (0.739) and (0.806), and they are all significant at the significance level (0.01). As for stability, it was calculated using Cronbach's alpha equation, and the stability coefficient was found to be equal to (0.789), and by half-split where the stability coefficient was found to be equal to (0.902), These results indicate that the test is suitable for application in the study.

### **2.1.3.2 Raven's Colored Progressive Matrices Intelligence Test for Children:**

This is an intelligence test that is applied to children aged (5.6-11.6). It consists of (36) colored matrices, graded in difficulty, divided into three groups: group (a) - group (a-b) - group (b), each with (12) matrices. A score of (1) is given for each correct answer, and a score of (0) is given for each incorrect answer. The highest score that the examinee can obtain in this test is (36) points, and the lowest score that the examinee can obtain is (0).

After knowing the total score obtained by the examinee, we go to the percentile norm list, which is attached to the booklet, to find out what this raw score corresponds to from a percentile score, taking into account that the score is considered under the age of the examinee, and after knowing the percentile score, we move on to find out what this score corresponds to from a description of the mental level and IQ.

As for the psychometric properties, the researcher has used the test in several studies and has calculated the psychometric properties for it several times. She found that it is suitable for application in our Algerian environment, so she did not re-calculate the properties.

### **2.1.3.3 Cognitive Skills Scale:**

**Definition of the scale:** Al-Bakr developed the Cognitive Skills Scale to measure the development of cognitive skills in children with autism spectrum disorder, by referring to the previous educational literature related to cognitive skills, and some scales that included the cognitive aspects of children with autism spectrum disorder (the Lovaas program for teaching children with autism spectrum disorder, and the Portage Profile Picture Test), and cognitive scales. It consists of (35) items distributed over three dimensions as follows:

- Dimension one (classification).
- Dimension two (sequence).
- Dimension three (matching).

This scale is presented to the classroom teacher or psychologist to answer the questions. The scale is corrected as follows:

- Applies to a very high degree is given (5) points.

- Applies to a high degree is given (4) points.
- Applies to a medium degree is given (3) points.
- Applies to a low degree is given (2) points.
- Applies to a very low degree is given (1) point.

The scores for each dimension are measured separately, then the scores for the three dimensions are added together to give the total score, so the highest score that the examinee can obtain on this scale is (175) points, and the lowest score is (35), and a child is considered to have cognitive skills if he scores (120) or more.

### **Psychometric properties of the Cognitive Skills Scale:**

The psychometric properties of the scale were calculated for validity using internal consistency validity between each item and after, where the correlation coefficients were found to be between (0.501) and (0.836), and they are all significant at the significance level (0.01), and between each item and the scale as a whole, where the correlation coefficients were found to be between (0.723) and (0.965). Its validity was also calculated using marginal comparison validity, where it was found to distinguish between low-performing and high-performing individuals. As for stability, it was calculated using Cronbach's alpha equation, and the stability coefficient was found to be equal to (0.802), and by half-split where the stability coefficient was found to be equal to (0.890). These results indicate that the test is suitable for application in the study.

#### **2.1.3.4 Psychological training program based on play activities:**

**Definition of the program:** It is a psychological training program based on play activities designed by the researcher on a scientific basis to help children with mild autism spectrum disorder develop some cognitive skills. It contains a set of activities derived from educational programs and the primary school curriculum, which is implemented in the form of individual psychological care sessions to develop cognitive functions. The 12-session play-based care program was offered at a rate of one or two sessions per week in a specially equipped room at the center, with each session lasting between 45 and 60 minutes.

The play-based care psychological training program was presented in its initial form to some specialized arbitrators, numbering (07), including university professors, specialists in psychology, as well as experienced psychological specialists in the field, to ensure its suitability for the goals, and the following is a presentation of the most important observations and proposals recorded by them:

- Adding some sessions.
- Relying on a variety of tools during sessions, such as bottles, and cups.

### **b- Objectives of the psychological training program based on play activities:**

The main objective of the psychological training program based on play activities is to help children with autism spectrum disorder develop some cognitive functions, and this goal is achieved through the following objectives:

- Explaining to parents the appropriate ways to develop cognitive skills in their children.
- Helping them to use games to develop some cognitive skills.
- Helping them to understand themselves.

The program was designed in the following steps:

**Step 1:** Review the theoretical aspects and many previous studies that have addressed play activities.

**Step 2:** The field survey stage, in which we took this step to gather as much information as possible about the subject of the study and the members of the community concerned, and on this basis we approached the members of the study sample and conducted interviews with their parents and psychologists at the center.

**Step 3:** Meeting with university professors specialized in psychology, where we benefited from their valuable guidance and advice on how to design the program and take their point of view on play activities that contribute to the development of cognitive skills in children with autism spectrum disorder, under their specialization in this field and their field experience.

**Step 4:** In light of the previous steps, we were able to gather the most information about the subject of the study, which helped us to design the program in its final form, which included (12) activities in twelve sessions, with the identification of the topic of each session, its goals, its techniques, its means, and its content, and it was organized logically and sequentially as follows:

- **Session 1:** Meeting session and building a counseling relationship with group members.
- **Session 2:** Free drawing session.
- **Session 3:** Coloring session.
- **Session 4:** Game assembly session 1.
- **Session 5:** Game assembly session 2.
- **Session 6:** Matching things session 1.
- **Session 7:** Matching things in session 2.

- **Session 8:** Alphabet song.
- **Session 9:** Animal sounds session.
- **Session 10:** Maze ring.
- **Session 11:** Sequencing things.
- **Session 12:** Closing session, thanking and appreciating group members with symbolic gifts.
- **Techniques used in sessions:** repetition method, memorization method, moral and material reinforcement, indoctrination method, listening method.
- **Means used in sessions:** paper, colors, eraser, pencil, ruler, coloring books, computer, CDs, cups, folders, buttons, thread, rope, colored rings, dolls.

## 2.2 Basic Study

### 2.2.1 Methodology :

The researchers used a semi-experimental design with a control and experimental group in their current study because it is appropriate for the study topic.

### 2.2.2 Study Population :

The study population consisted of children enrolled at the Mostaganem Psychopedagogical Center, totaling 111 children.

### 2.2.3 Place and Duration of the Basic Study :

The field study was conducted during the 2021/2022 school year, from 15/01/2022 to 20/04/2022.

### 2.2.4 Basic Study Sample :

The study sample consisted of 6 children with mild autism spectrum disorder who were selected purposively. They were divided into two groups: a control group of 3 children who did not receive the program training, and an experimental group of 3 children who did receive the program training.

### 2.2.6 Basic Study Tools :

The study tools were the same as those mentioned in the pilot study, namely:

- The Autism Spectrum Disorder Scale by Mohamed Adel.
- The John Raven Colored Progressive Matrices Test to measure intelligence in children.
- The Cognitive Skills Scale by Barakat.
- The psychological training program is based on play activities developed by the researcher.

### 2.2.6 Statistical Methods Used in the Study :

SPSS.20 statistical software was used to process the study hypotheses using the following statistical methods:

- Mann-Whitney test for two independent samples.
- Wilcoxon test for one sample

## 3. Presentation, Interpretation, and Discussion of the Study Hypotheses Results

**First: Presentation and interpretation of the first sub-hypothesis:** which states that there are statistically significant differences between the control group and the experimental group in cognitive skills after the application of the program, and in favor of the experimental group.

**Table 1:** Shows the results of the first hypothesis processed by the Mann-Whitney test.

Group	Number of Individuals	Mean Rank	Standard Deviation	u Value	SIG Value
Control	3	2	6	0.00	0.046
Experimental	3	5	15		

From **Table 1**, it can be seen that the value of sig, which is equal to **0.046**, is smaller than the significance level of **0.05**. Therefore, we accept the research hypothesis that states: There are statistically significant differences between the control group and the experimental group in cognitive skills after the application of the program, in favor of the experimental group, and we reject the null hypothesis.

We also note that the mean rank for the experimental group, which is **5**, is higher than the mean rank for the control group, which is **2**. Therefore, the psychological training program based on play activities helped the experimental group to improve cognitive skills.

## Secondly: Presenting and interpreting the results of the second hypothesis:

The second hypothesis states that there are statistically significant differences between the mean ranks of the pre-test and post-test of the experimental group members on the cognitive skills scale, in favor of the post-test.

**Table 2:** Shows the results of the second hypothesis processed by the Wilcoxon test for a single sample.

Group	Number of individuals	The mean rank of negative ranks	The mean rank of positive ranks	Z-test value	p-value (Sig value)
Pre-test	03	3.50	0.00	2.027	0.027
Post-test	03				

**Table 2** shows that the Sig value, which is equal to **0.027**, is less than the significance level of **0.05**. Therefore, we accept the research hypothesis that states: There are statistically significant differences between the mean ranks of the pre-test and post-test scores of the experimental group members on the cognitive skills scale, in favor of the post-test. We reject the null hypothesis.

## 4. Discussion of the study hypotheses:

The results showed that there are statistically significant differences between the mean ranks of the pre-test and post-test scores of the experimental group members on the cognitive skills scale, in favor of the post-test. There are also statistically significant differences between the control group and the experimental group in cognitive skills after the application of the program, in favor of the experimental group. These results are consistent with the results of several studies, including the study by Elisabeth (1994), the study by Francesca (2003), the study by Tanaka (2003), and the study by Christine Bert and Lady Klinck (2007). These studies found that art activities and play are important for improving cognitive skills in children with autism.

The researcher attributes this to the fact that play is a vital part of our childhood memories. It is truly sad to imagine that there are children who have not gone through this beautiful stage of life and have not spent a beautiful time with their friends or have not enjoyed it. Most children with autism spectrum disorder spend their lives away from people and children of their age and play stereotypically with a lot of self-stimulation without a functional goal. They may spend hours lining up toys in a very organized way according to color or type, or they may spend time staring at the light in a musical toy. To know the

importance of play for these children, we need to know the reason behind the inability of these children to play in a normal way. (Haddad, 2014, p. 1)

In this context, for a child to engage in functional and social play, he must go through the early stages, starting with the simple movement of objects to other stages of play. Children with autism spectrum disorder have difficulties in this because of their lack of curiosity and the need to explore. Instead, they engage in repetitive behaviors such as sucking and licking.

The cognitive hypothesis sees the main problem as being related to perception, which means that there are problems and deviations resulting from weak thinking and the ability to form and move symbols. The innate hypothesis is based on the idea that taught play is better than spontaneous play. This contradicts the cognitive theory related to perception, which also suggests that the child can imagine but does not do so spontaneously due to repeated failures. Children with autism spectrum disorder suffer from a lack of spontaneous play in natural and spontaneous situations. This is not due to their inability to play, but rather to the difficulty of the play itself and the repeated and failed attempts, which necessarily leads to frustration and loss of the incentive to play. (Fatiha, 2006, no page)

On the other hand, the development of language skills in these children does not take place in the same way as the development of the skills of their peers. Over time, the gap between them in this area widens, which drives them to isolation. There is another reason, which is that they lack social communication skills, which in turn are affected by linguistic delay. The importance of teaching these children the skill of playing lies in enabling them to acquire skills that qualify them to communicate with their peers and enable them to form friendships and feel a sense of belonging to the group.

Therefore, we have noticed that children with autism spectrum disorder, through play, tend to be attracted to exciting colors such as coloring circles. Mental coloring is one of our favorite activities, whether we are adults or children. Focusing on one task helps to clear the mind away from daily stresses. (website of useful games for children, 2021)

There is another important motivation for teaching children with autism spectrum disorder the skills of play, namely that play is an important area for teaching many other skills, such as language, communication, empathy, role-playing, numbers, and letters. Playing helps to acquire these skills. The lack of play skills for children with autism spectrum disorder can multiply their social isolation and highlight their differences from the rest of the children. Playing for these children should be fun, because developing their play skills gives them a sense of excellence and mastery, which increases their happiness and motivation, and helps them to learn and practice new skills in a safe environment. (Haddad, 2014, p02)

This result confirms that the psychological training program based on play activities contributed to raising the cognitive skills of children with autism spectrum disorder and achieving success among the members of the experimental group. The children benefited

from the sessions of the psychological care training program based on play activities, which included: free drawing, music, sequencing, and matching. This indicates that activities play a major role in raising cognitive skills. These activities help to teach children with autism spectrum disorder patience, self-reliance, and increased self-confidence.

It is worth noting that the diversity in the use of techniques, such as repetition, moral and material reinforcement, and the method of indoctrination in the program sessions, contributed to motivating the members of the experimental group to benefit from them.

By presenting the results of the two sub-hypotheses, we see that the main hypothesis has been realized, which says that the psychological training program based on play activities is effective in raising the cognitive skills of children with autism spectrum disorder. This is what the study results have reached.

## **5. Conclusion :**

Many people may not know that play therapy was initially a means of psychological therapy for children who suffer from psychological trauma, anxiety crises, and mental illness. After that, play became a tool used to understand children's feelings and find appropriate mechanisms to adapt to their environment. Play has become a therapeutic method used by specialists with children with autism spectrum disorder with the development of science, especially since the play technique relies on enhancing the interests of children with autism spectrum disorder to develop their cognitive skills.

Based on the findings of our study, we suggest the following:

- Developing programs and curricula based on play activities for children with autism spectrum disorder.
- The need to conduct studies on the role of play in developing the child's creative abilities, especially children with autism spectrum disorder.
- Conducting many in-depth studies on children with autism spectrum disorder.

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