

The Effect of a Recreational Sports Program Based on Semi-Sport Games on Improving Social Interaction and Reducing Stereotypical Behavior among Children with Autism Spectrum Disorder

اثر برنامج رياضي ترويحي قائم على الالعاب شبه الرياضية على تحسين التفاعل الاجتماعي وتقليل السلوك النمطي لدى اطفال طيف التوحد

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Abstract : This study aimed to investigate the effect of a recreational sports program based on semi-sport games on improving social interaction and reducing stereotypical behavior among children with Autism Spectrum Disorder (ASD). The study adopted a one-group experimental design and included a purposive sample of six children aged between 6 and 10 years. The program was implemented over eight weeks. Data collection tools included a structured questionnaire. The results indicated the program's effectiveness in significantly enhancing social interaction and notably reducing stereotypical behaviors.

Keywords: Recreational Program- Semi-Sport Games- Social Interaction- Stereotypical Behavior- children with Autism Spectrum Disorder.

المخلص : هدفت هذه الدراسة إلى التعرف على أثر برنامج رياضي ترويحي قائم على الألعاب شبه الرياضية في تحسين التفاعل الاجتماعي وتقليل السلوك النمطي لدى أطفال طيف التوحد. اعتمدت الدراسة على المنهج التجريبي بتصميم المجموعة الواحدة، وتكونت العينة من 6 أطفال تتراوح أعمارهم بين 6 و 10 سنوات، تم اختيارهم بطريقة قصدية تم تطبيق البرنامج لمدة 8 أسابيع. تمثلت أدوات البحث في الاستبيان. وقد أظهرت النتائج فاعلية البرنامج المقترح في تحقيق تحسن كبير في التفاعل الاجتماعي، وانخفاض ملحوظ في السلوك النمطي لدى أفراد العينة. الكلمات المفتاحية : برنامج ترويحي - العاب شبه رياضية - التفاعل الاجتماعي- السلوك النمطي- أطفال طيف التوحد.

1. Introduction and problem of the study:

Mental health and illness are not only physical, psychological, or mental phenomena and events, rather they are complex social phenomena which are associated to wide range of social and cultural variables and factors. Therefore any attempt to reduce illness or health to its psychological, mental, or biological dimensions would result in a severely limited understanding of these phenomena. Throughout human history, human societies have known and linked mental and psychological illnesses, such as autism spectrum disorder, to popular beliefs. These include beliefs Magic, sorcery, and the belief in the existence of evil spirits that cause mental illness, as well as the practice of cupping and exorcism, are a cultural therapeutic heritage practiced by certain individuals. (Hamdawi, 2024, p. 307)

Autism is a common developmental disorder that affects social interaction communication, and behavior in individuals. This disorder manifests itself through a wide variety of difficulties and challenges, including multiple problems related to motor skills and motor coordination, exposing children with autism to daily challenges. (Muammar and Qaddour Bay, 2024, p. 321) It is a disability that is not rare and cannot be ignored, but it has not received sufficient attention in developing countries, while there has been increasing interest toward this illness in developed countries, and interest in it has increased in Arab countries in recent years. (Ahmed and Khader, 2024, p. 676)

According to the World Health Organization, autism is a developmental disorder that appears before the age of three, characterized by impairments in language use, play social interaction, and communication. Most studies indicate that its prevalence ranges from 4 to 15 cases per 10,000 people worldwide. (Younis and Qadri, 2025, p. 366)

Children on the autism spectrum are considered a group of people with special needs, requiring protection, attention, and care. It is well known that autism is a pervasive developmental disorder that affects the individual's social, linguistic, and behavioral aspects during childhood. (Khaldoumi, 2012, p. 45)

Stereotyped behavior is one of the most prominent behavioral abnormalities characteristics of autistic children, distinguishing them from other children with disorders. Most autistic children exhibit one or more of these stereotypical behaviors, so that those who interact with these children can easily notice these behaviors, such as head shaking, thumb sucking, body rocking, screaming, giggling, hand clapping, finger snapping, and spinning in place. (Thabit Al-Farkh, 2023, p. 746)

Children with autism spectrum disorder (ASD) often display restricted behaviors and severe emotional outbursts, impairing their social engagement. Core deficits in verbal and nonverbal communication hinder their emotional and social development, frequently triggering maladaptive behaviors (e.g., aggression, self-harm) due to frustration. This study defines social interaction as reciprocal verbal or visual exchanges enabling relationship-building, such as peer sharing and friendship formation. Addressing these challenges is critical for improving adaptive functioning in children with ASD. (Ahmed and Jafar Ali, 2024, p. 55)

Sports activities significantly enhance the physical and psychological well-being of children, especially those with special needs. Semi-sports games help children with disabilities engage socially, express themselves, and develop their potential. Their adaptable, low-skill nature makes them ideal for autistic children, fostering confidence and reducing behavioral challenges through safe, supervised motor experiences. (Ben Alia, Verm, and Rabouh, 2024, p. 678)

Many studies and researches have addressed this topic, including the study by Amira Salem Thabet Al-Farkh (2023), published in the *Childhood Journal*, Cairo University, titled "The Effectiveness of a Program Based on Group Games to Reduce the Severity of Stereotypical Behavior in a Sample of Children with Autism Spectrum Disorder." The researcher aimed to identify the effectiveness of a program based on group games. The study used a quasi-experimental approach with a single-group design on a sample of 10 male children, aged between 4 and 6 years, who were deliberately selected from the Namaa

Center in Giza. The study tools included the Raven's Colored Matrices Test, scales for assessing and diagnosing autism and stereotypical behavior disorders, in addition to the applied program. The results confirmed the effectiveness of the program in reducing stereotypical behavior, with a continued positive effect observed during the follow-up assessment. In 2024 Nael Ben Alia et al. conducted a study published in the Journal of the Sports System, University of Djelfa, entitled "The Effect of a Recreational Program Using Parasports Games on Improving Some Behavioral Characteristics in Autistic Children." The study adopted the experimental approach with a single-group design. The sample included 6 autistic children, aged between 9 and 11 years, who were deliberately selected from the adapted section in Dar Al-Shuyukh. The recreational program was implemented for 8 weeks with two sessions per week, each 40 minutes per session. The tools used included a questionnaire form and an observation sheet. The results showed significant differences in favor of the experimental group, indicating the program's effectiveness in improving both stereotypical and social behavior. In the same context, a study by Mohamed Riad Ahmed et al. (2024), published in the Journal of the Faculty of Education, Egypt, addressed the topic of "A Parent-Guided Program Based on the Hanen Approach to Improving Social Interaction Skills in Children with Autism Spectrum Disorder." The study aimed to examine the effectiveness of a guidance-based intervention directed at parents. The researchers used an experimental approach with a quasi-experimental design on a single experimental group consisting of 10 parents of children with autism. A checklist and scale of social interaction skills were employed, along with a guidance manual for parents. The results confirmed the program's effectiveness in significantly improving children's social interaction skills. A study by Zainab Mohamed and Ali Erfan (2025), published in the Journal of Qualitative Education Research, Mansoura University, Egypt, was titled "The Effectiveness of a Training Program Based on Applied Behavior Analysis (ABA) in Reducing Stereotypical Behavior and Improving Social Interaction in a Sample of Children with Autism Spectrum Disorder." The study used an experimental approach with a two-group design (experimental and control). It included a homogeneous sample of 8 children aged between 4 and 6 years, who were purposefully

divided into two groups. A 30-session training program was implemented over a period of 3 months, using the Stereotypical Behavior Scale and the Social Interaction Scale. The results showed a significant decrease in stereotypical behavior and an improvement in social interaction among members of the experimental group.

Based on this, it can be said that sports play a crucial role in the lives of children including those with autism spectrum disorder. Despite the difficulties they face, practicing sports can be beneficial for this group. However, in our country, through our fieldwork and observations, school health officials exempt children with autism spectrum disorder from physical education and sports classes. This prompted the idea of this study, which aims to investigate the impact of a recreational program based on semi-sports games on developing certain behavioral characteristics in children with autism spectrum disorder. The research problem was crystallized by posing the following question:

- ✓ Does the proposed recreational sports program using semi-sports games have an impact on improving social interaction and stereotypical behavior in children with autism spectrum disorder?

This main question is divided into the following sub-questions:

1. Are there statistically significant differences between the pre- and post measurements in the domain of the social interaction among children with autism spectrum disorder, in favor of the post-measurement?
2. Are there statistically significant differences between the pre- and post measurements in the domain of the stereotypical behavior among children with autism spectrum disorder, in favor of the post- measurement?

In response to these questions, the study hypotheses are as follows:

- ✓ The recreational sports program using semi-sports games has a positive effect on improving social interaction and stereotypical behavior in children with autism spectrum disorder.
- 1. There are statistically significant differences in favor of the post-measurement in the domain of social interaction among children with autism spectrum disorder.
- 2. There are statistically significant differences in favor of the post-test in the domain of the stereotypical behavior among children with autism spectrum disorder.

From a practical perspective, this study aims to achieve a number of objectives, summarized as follows:

1. Design a scientifically based recreational program using semi-sports games aimed at improving certain behavioral characteristics (social interaction, stereotypical behavior) in children with autism spectrum disorder.
3. Measure the effectiveness of the recreational program in reducing some undesirable behaviors in children with autism spectrum disorder.
4. Raising awareness among families and the community about the importance of these programs and their positive impact on developing the personalities of autistic children and their social integration.

The importance of this study lies in its scientific and practical contribution to supporting children with autism spectrum disorder by offering a scientifically based recreational program that relies on semi-sports games as an effective means to improve some basic behavioral characteristics, most notably stereotypical behavior and social interaction. Furthermore, the study contributes to bridging a research gap related to the use of recreational activities in therapeutic and educational settings for this group and highlights the vital role of families and communities in the success of such programs, improving the

opportunities for social integration of autistic children and contributing to enhancing their quality of life.

2. Methodological Approaches Used in the Study:

2.1 Pilot Study:

The pilot study aims to provide the researcher with a clearer understanding and to form an accurate initial perception of the nature the field to be studied. This helps in building a preliminary database about the research sample. The purpose is to prepare the appropriate technical tools that will be used later in the main study by examining the field environment in which the experiment will be conducted. This phase was carried out to achieve a number of objectives, including:

- ✓ Testing the psychometric properties of the research tool (such as validity and reliability).
- ✓ Ensuring the appropriateness of the scale and the extent to which the sample members understand its items and terminology.
- ✓ Determining the approximate time required to complete the scale. (Ben Abdallah Abdelkader, 2018, p. 138)

In this context, three cases of autistic children (two males and one female) were purposefully selected from the same study population. The questionnaire was distributed to their supervising educators in order to ensure the validity of the tools before applying the actual study to the main sample.

2.2 Study Methodology:

Since the nature of the phenomenon under study determines the most appropriate scientific approach, the experimental approach with a single-group design was adopted, as it is most appropriate for the objectives of the current study, which seeks to

measure the effectiveness of a proposed recreational program. This approach is defined in the field of sports, as stated by Muhammad Alawi, as "the objective observation of a phenomenon which occurs in a setting characterized by strict control, involving one or more manipulated variables while other variables are held constant." (Fatima Awad Saber, Mervat Ali, 2002, p. 25)

2.3 Study Sample:

A sample is defined as a portion of the study population from which field data is collected. It represents the original population in a way that allows the results to be generalized to it. (Zarwati Rachid, 2007, p. 344)

In this study, a single-group sample was purposefully selected, comprising six children with autism (3 males and 3 females), aged between 6 and 10 years, was chosen from the adapted education section in Chelghoum El Aid (Mila Province). They were selected based on their regular attendance and interaction within the section, ensuring a suitable environment for implementing the proposed recreational program.

It was confirmed that all sample members did not suffer from disabilities or diseases associated with autism, enhancing the accuracy of measuring the impact of the proposed program. The sample members were also characterized by homogeneity in general characteristics.

2.4 Study Variables:

2.4.1 Independent Variable:

The independent variable in this study is the recreational sports program based on semi-sport games.

2.4.2 Dependent Variable:

The dependent variable in this study was social interaction and stereotypical behavior.

2.5 Study Limitations:

2.5.1 Time Frame: The field study was conducted on the primary sample during the period from November 12, 2024, to January 10, 2025.

2.5.2 Spatial Frame: The field study was conducted at Al-Amari Madi Elementary School in Chelghoum El-Eid, Mila Province, which has a special section for children with autism spectrum disorder.

2.6 Data and Information Collection Tools:

2.6.1 The Questionnaire:

In this study, the questionnaire was the primary tool designed by the researcher. It was developed based on The Vineland Adaptive Behavior Scale (VABS), which assesses social behavior, as well as the Repetitive Behavior Scale—Revised (RBS-R), developed by Bodfish et al. (2000), which focuses on stereotypical behaviors.

The questionnaire consisted of 20 questions divided into two main domains: the first, which concerned social interaction, comprised 10 questions, and the second, which concerned stereotypical behavior, also comprised 10 questions. All statements were constructed using a five-point Likert scale.

The questionnaire was distributed to the educators supervising the children in the sample, with the aim of identifying key behavioral characteristics among the children with autism, particularly in terms of social interaction and stereotypical behaviors. In addition, an observation tool was used to closely monitor the children's behaviors during the application of the program.

2.6.2 The Proposed Recreational Sports Program:

A proposed recreational program based on semi-sport games was implemented. This program underwent a detailed and careful design process before being applied in its final form to the target sample.

During the development of the program, special attention was paid to the principle of safety and security, which is considered fundamental due to the sensitivity of the target group. The program was also tailored to suit the interests and preferences of autistic children, as individuals with special needs require dedicated care and attention by qualified professionals.

To ensure the successful implementation of the program and to achieve **positive outcomes**, the following key principles were emphasized:

- Ensuring flexibility and ease in performing the program's activities, with occasional tolerance.
- Gradually progressing from simple to complex in the selection of games, whether in terms of understanding or performance ability.
- Avoiding forcing the child to perform tasks; instead, assisting and accompanying them through the process.
- Supporting the educator and the assistant in helping the autistic child carry out the activities.
- Attempting to create a competitive atmosphere within the proposed games that ensures fun and enjoyment for this group.
- Focusing on motivation and encouragement, such as thanking the child, applauding them, or giving small symbolic rewards like treats or candy when they try to perform the required task.

2.6.3 Implementation of the Proposed Recreational Program:

The recreational sports program was implemented for children with autism over a period of eight weeks, with two sessions per week, each lasting 40 minutes, divided into three phases:

- Preparatory Phase (10 minutes): Includes physical and psychological preparation exercises for the beginning of the session.
- Main Phase (25 minutes): Includes the implementation of the semi-sports games included in the program.
- Final Phase (5 minutes): Calming exercises were used to help calm the children and gradually return them to their normal emotional and physical state.

2.7 Scientific Conditions of the Tool:

2.7.1 Validity:

The validity of the study questionnaire was assessed through internal consistency validity.

➤ Internal consistency validity of the social interaction axis:

To determine the internal consistency validity of the social interaction axis, the correlation coefficient was calculated between the scores of each statement and the total score of the axis to which it belongs. The following table illustrates this:

Table (01): Internal Consistency Validity for the Social Interaction Axis

Item No	01	02	03	04	05	06	07	08	09	10
Pearson Correlation	0.90	0.98	0.75	0.75	0.76	0.82	0.76	0.82	0.90	0.98
Significance (sig)	*0.000	*0.000	*0.01	*0.01	* 0.01	* 0.000	*0.01	*0.004	*0.000	*0.000

Source: Researchers, 2025

From Table (01), we observe that the significance values for the items within the social interaction axis and the total score range between [0.000, 0.01] which are below the error rate of 0.05. This indicates statistically significant correlations between the items and the total score of the psychological motivation domain, demonstrating that the items in the social interaction domain have a high validity coefficient.

➤ Internal Consistency Validity for the Stereotypical Behavior Domain:

To extract the internal consistency validity of the stereotypical behavior domain, the correlation coefficient was calculated between the scores of each statement and the total score of the axis to which it belongs. The following table illustrates this:

Table (02): Internal Consistency Validity for the Stereotypical Behavior Domain

Item No	11	12	13	14	15	16	17	18	19	20
Pearson Correlation	0.90	0.68	0.82	0.98	0.68	0.79	0.68	0.72	0.79	0.98
Significance (sig)	*0.000	*0.03	*0.000	*0.000	*0.03	*0.007	*0.03	*0.02	*0.007	*0.000

Source: Researchers, 2025

From Table (02), we observe that the p-values range between [0.000, 0.03] which are below the error of 0.05. This confirms a statistically significant correlation between each item and the total score of the stereotypical behavior domain, indicating high internal consistency validity for the items.

2.7.2 Reliability:

To assess the reliability of the questionnaire, the Cronbach's Alpha coefficient was used which is one of the most commonly applied methods for measuring internal consistency. It calculates the variance among responses to determine how well the items in a scale measure the same construct. (Rami Salah, 2020, p. 220)

➤ **Cronbach's alpha reliability for the study questionnaire:**

To extract the reliability coefficient for the study questionnaire, Cronbach's alpha was used as illustrated in the following table:

Table (03): Cronbach's Alpha Reliability Coefficients for the Study Questionnaire

Questionnaire Axes	Number of Items	Cronbach's Alpha Value
Social Interaction	10	*0.95
Stereotypical Behavior	10	*0.98
Overall Questionnaire	20	*0.97

Source: Researchers, 2025

From Table No. (03), we note that the Cronbach's alpha values for the questionnaire axes social interaction, stereotypical behavior, and the questionnaire as a whole reached: 0.95 0.98, 0.97, which are high values close to one, and this indicates that the study questionnaire has a high reliability coefficient.

2.8 Statistical Tools:

To conduct this study, the following statistical tools were used, using SPSS V. 26:

- Arithmetic mean.
- Standard deviation.
- Shapiro-Wilk normal distribution test
- Wilcoxon test.
- Pearson simple correlation coefficient.
- Cronbach's alpha coefficient.
- Effect size coefficient r.
- Percentage of improvement.

3. Presentation, Discussion, and Interpretation of Results:

3.1Presentation, Discussion, and Interpretation of the First Hypothesis Results:

The first hypothesis states: There are statistically significant differences in favor of the post-measurement on the social interaction domain among children with autism spectrum disorder.

To determine the nature of the differences between the pre-test and post-test results on the social interaction domain among the study sample, the Wilcoxon test was used after verifying the nature of the data distribution. The following table illustrates this:

Table (04): Results Showing the Differences Between Pre- and Post-Measurement Improvement Percentage, and Effect Size (r) for the Social Interaction Axis in the Study Sample

Axis	Pre-measurement		Post-measurement	
	Mean	Standard Deviation	Mean	Standard Deviation
Social Interaction	1.98	0.09	3.67	0.08
Improvement Rate	86.9%			
Wilcoxon Probability (sig)	0.028			
Significance Level	0.05			
Statistical significance	Statistically significant			
Effect Size r	0.90			
Significant Effect Size	Large effect			

Source: Researchers, 2025

The results of Table (4) show statistically significant differences between the mean scores for social interaction in the pre-test and post-measurements. The pre-measurement

mean was 1.98, with a standard deviation of 0.09, while the post- measurement mean was 3.67, with a standard deviation of 0.08. This reflects a marked improvement in the level of social interaction among the sample members after implementing the program.

The results of the Wilcoxon test of differences indicated the presence of statistically significant differences, as the p-value for the z-score was ($p = 0.028$) which is less than the significance level of 0.05, confirming the positive impact of the program on this variable. The percentage of improvement reached approximately 86.9%, which is considered a significant practical improvement. The effect size (r) reached approximately 0.90, which is a very large effect size (greater than 0.5), indicating that the recreational sports program had a strong and effective impact in improving the social interaction of children with autism spectrum disorder.

Researchers attribute this improvement to the nature of the program, which is based on semi-sport games that encourage group interaction, social communication, and participate in fun and safe activities. These factors encouraged children to break out of their stereotypical isolation and gradually develop their social skills over the eight weeks of the program.

The current study's findings on the effectiveness of recreational sports programs in enhancing social interaction among children with ASD align with several recent studies. Zainab Muhammad and Ali Irfan (2025) demonstrated significant improvements through an ABA-based training program. Similarly, Nael Ben Alia et al. (2024) reported positive outcomes using semi-sport games, showing marked differences favoring their experimental group. Muhammad Riyadh Ahmad et al. (2024) further supported these findings through a parent-mediated Hanen approach program, revealing statistically significant enhancements in social interaction skills. These consistent results across different intervention approaches (direct programs, semi-sport activities, and parent-guided methods) collectively validate our findings and underscore the potential for improving social behavior in children with ASD through structured interventions.

Based on the above and the results obtained, this hypothesis is confirmed.

3.2Presentation, Discussion, and Interpretation of the Second Hypothesis Results:

The second hypothesis states: there are statistically significant differences in favor of the post-measurement in the stereotypical behavior axis among children with autism spectrum disorder.

To examine the nature of the differences between the pre- measurement and post-measurement results for the stereotypical behavior axis in the study sample, the Wilcoxon test was applied after verifying the distribution of the data. The following table presents the results.

Table (05): Results Showing the Differences Between Pre- and Post-Measurement, Improvement Percentage, and Effect Size (r) for the Stereotypical Behavior Axis in the Study Sample

Axis	Pre-measurement		Post-measurement	
	Mean	Standard Deviation	Mean	Standard Deviation
stereotypical behavior	4.4	0.15	2.19	0.23
Improvement Rate	51.6%			
Wilcoxon Probability (sig)	0.032			
Significance Level	0.05			
Statistical significance	Statistically significant			
Effect Size r	0.90			
Significant Effect Size	Large effect			

Source: Researchers, 2025

Table (05) shows statistically significant differences between the pre- and post-measurements of stereotypical behavior. The pre-measurement mean was (4.4) with a standard deviation of (0.15), compared to the post-measurement mean of (2.19) with a

standard deviation of (0.23). This indicates a significant decrease in the level of stereotypical behavior after the intervention.

The Wilcoxon test also showed a statistically significant difference, with a probability value of z ($p = 0.032$), which is less than the significance level of (0.05). The improvement percentage in this axis reached approximately 51.6%, and the effect size (r) was approximately 0.9, which is classified as very large (greater than 0.5), confirming that the program has effectively contributed to reducing stereotypical behavior in children.

Researchers attribute this decrease to the fact that the program's guided recreational activities helped engage children in new and positive behavior patterns and provided them with motor and expressive outlets which reduced their need to repeat stereotypical behaviors often caused by stress, boredom, or monotony. Furthermore, improved social interaction may have indirectly helped to reduce these behaviors by integrating the child with peers.

The results of the current study on the effectiveness of a recreational sports program in reducing stereotypical behavior in children with autism spectrum disorder are consistent with the findings of many previous studies addressing this issue. The study by Zainab Muhammad and Ali Irfan (2025) demonstrated the effectiveness of a training program based on Applied Behavior Analysis (ABA) in significantly reducing stereotypical behavior in children, demonstrating the ability of structured therapeutic programs to positively impact this type of behavior. The study by Nail Bin Alia et al. (2024) also showed that a recreational program based on semi-sports games led to a significant improvement in stereotypical behavior in the study sample, with statistically significant differences in favor of the post-measurement. In the same vein, the study by Amira Salem Thabet Al-Farkh (2023) concluded that a group games program contributed to a reduction in stereotypical behavior in children with autism spectrum disorder. This positive effect persisted even in follow-up testing, reflecting the program's long-term effectiveness. Collectively, these findings indicate that stereotypical behavior can be modified through systematic recreational or training interventions.

Based on the above-mentioned findings and the results obtained, this hypothesis is confirmed.

4. Study Conclusions and Recommendations:

Based on the research and discussion conducted in this study, it can be concluded that the recreational sports program based on semi-sport games demonstrated prominent effectiveness in developing certain behavioral characteristics in children with Autism Spectrum Disorder (ASD).

The study results indicate that the program had a positive and effective impact in:

- Significantly improving social interaction, with statistical significance.
- Reducing stereotypical behavior to a noticeable and statistically significant degree.

These findings affirm the importance of integrating structured recreational activities into the educational and therapeutic programs targeting this group given their vital role in promoting psychological and social adaptation and improving quality of life.

Based on the findings, the following recommendations are proposed:

- Implement the proposed recreational program within educational institutions and specialized centers, given its effective impact on improving the behavior of children with Autism Spectrum Disorder.
- Do not exempt children with autism from physical education classes; rather these sessions should be adapted to their abilities, using semi-sport games as a tool for support and rehabilitation.
- Train and qualify educators and facilitators in the field of recreational activities for autistic children to ensure the effective implementation of educational programs.
- Encourage future applied research based on diverse recreational programs to examine their impact on other aspects such as language, emotions, or family adaptation.

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