Journal of Sport Science Technology and Physical Activities
ISSN : 1112-4032
eISSN 2543-3776

VOL: 23 / N°:1 (June 2026), p: 151 /162

The Role of Team Sports Practice in Developing Communication in Children with Autism.

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ARTICLE INFORMATION

Original Research Paper
Received : 15/07/2025
Accepted : 03/01/2026
Published: 01/06 /2026

https://doi.org/10.5281/zenodo.19518125

Keywords:
Team sports, Communication, Autism.

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Abstract

The Object of the study aims to identify the extent to which there are statistically significant differences between the pre-test and post-test application of a team sports program on the communication of children with autism compared to neurotypical children. To this end, the experimental method was used on a purposive sample of 8 autistic children. Data were collected using a verbal and non-verbal communication scale and a proposed team sports program. After collecting and statistically analyzing the results, it was found that there are statistically significant differences in favor of non-verbal communication among autistic children practicing team sports. However, no significant differences were observed in verbal communication. These findings were interpreted in light of the sample's characteristics and the nature and duration of the program. Based on this, the study recommends applying the program to a larger number of autistic children, increasing the duration of the program, focusing on teaching socially appropriate communication skills outside classroom settings, and emphasizing the integration of children with autism alongside their neurotypical peers during daily activities.

I. Introduction

Team sports are among the most important activities that contribute to the holistic development of children, as they enhance both fine and gross motor skills, and promote social and emotional growth. Through group interaction in games such as football and handball, children learn values like cooperation, discipline, and respect for rules, which help build a well-balanced personality (Bailey, 2006).

Studies have also shown that participating in team sports reduces aggressive behavior and enhances a sense of belonging and group identity (Eime et al., 2013).

Furthermore, such activities are an effective tool to improve mental health and prevent stress and anxiety during early childhood, fostering self-confidence and problem-solving skills within a socially safe environment.

Play is one of the most effective means to develop communication skills in children with autism. It is a spontaneous daily activity that helps cultivate all aspects of a child's experiences, emotions, and growing skills. Through play, the child explores the external world both realistically and imaginatively, engaging with its elements and symbols. Understanding and interacting with this world enhances communication, as play satisfies a child's natural need for exploration and interaction (Abdelrazak Khaled, 2001).

Autism is considered one of the most severe and complex disabilities due to its impact on behavior, learning, adaptation, and social independence. It particularly affects language, social relationships, and communication, limiting interaction with both people and the surrounding physical environment.

A child's need for communication begins from birth, especially during breastfeeding, where the infant not only seeks nourishment but also emotional presence. If a robot were to fulfill a child's physical needs, it might lead to the development of an emotionally unbalanced personality. Communication thus goes beyond satisfying biological needs, also addressing psychological and social needs, such as the need for security and affection (Kamal Abdelwahab, 1994).

Communication channels between autistic children and the external world are often limited. This deficiency leads to social and emotional difficulties in interacting with others, such as social withdrawal, avoidance of verbal and non-verbal communication, and lack of understanding of social norms due to their unique characteristics and lack of prior experience.

Previous Studies Relevant to the Current Research:

One relevant study is by Ibtissam Mchri and Ibtissam El-Hassani (2021), titled "The Effectiveness of a Proposed Training Program for Developing Non-Verbal Communication Skills in Children with Autism Spectrum Disorder," conducted in the city of Oum El Bouaghi. The study aimed to examine the effectiveness of a proposed training program designed to improve non-verbal communication in children with autism. The researchers used a quasi-experimental method on a sample of 6 children diagnosed with mild autism. The CARS (Childhood Autism Rating Scale) was used to confirm the homogeneity of the sample. A special scale for assessing non-verbal communication skills was developed, alongside the design and application of a training program (by the researcher). The results revealed varying degrees of effectiveness of the proposed program across different dimensions of non-verbal communication.

Another study by Djadda Issa and Boubekeur Sadek (2021), titled "The Impact of Sports Games on the Development of Social Communication in Children with Autism," conducted in Boumerdes, aimed to determine the effect of sports games on social communication skills in autistic children. A total of 12 children (10 boys and 2 girls) participated in the experimental study. A program consisting of small games was implemented along with a social communication rating scale. The findings showed that the program created an environment of interaction, contact, and both individual and group play among the children. Based on these results, the study recommended focusing on teaching small games, providing tools and modeling, and applying direct instruction and repetition for children with autism.

A third study was conducted by Lina Omar Siddiq (2005) in Riyadh, titled "The Effectiveness of a Proposed Program to Develop Non-Verbal Communication Skills in Children with Autism." The experimental method was applied to a sample of 38 children with autism aged between 4 and 6 years. The sample was divided into an experimental group of 18 children and a control group of 20 children. To achieve the study’s goal, the researcher developed a rating scale for non-verbal communication skills. The results showed statistically significant differences in non-verbal communication skills between the two groups in the pre- and post-tests, favoring the experimental group.

Through her fieldwork with this population, the researcher observed that children with autism tend to avoid their neurotypical peers and refrain from interacting with them, often expressing themselves through screaming

or crying, especially during waiting times at Dr. Walid Ennoui's pediatric clinic in Reghaïa, Algeria. These behaviors led to social isolation, due to the children's weak acquisition of proper social interaction patterns and normative social behavior.

Based on the above, the following **general research question** is posed:

Are there statistically significant differences between the pre-test and post-test application of the team sports program on the communication scale of children with autism compared to neurotypical children?

This general question leads to **the following sub-questions**:

-Are there statistically significant differences between the pre-test and post-test application of the team sports program on the verbal communication scale of children with autism compared to neurotypical children?

-Are there statistically significant differences between the pre-test and post-test application of the team sports program on the non-verbal communication scale of children with autism compared to neurotypical children?

II. Method and Materials

The study employed **the experimental method.**

Population: Children with autism residing in Algiers Province.

Sample: The sample consisted of 8 children with autism, aged between 8 and 10 years.

Fields of the Study:

Spatial Field: The study was conducted at the clinic of Dr. Ennoui, a pediatrician in the municipality of Reghaïa, in addition to a public park in the same municipality (in the "Zahrat Essawsan" – "Les Iris" neighborhood) which contains fields for various team sports.

Temporal Field: The study was conducted from the second week of March 2024 to the first week of June 2024, with the program applied over a period of 15 weeks.

1. Study Tools: Verbal and Non-verbal Communication Scale

Preliminary Data Form:

The researcher designed a form to collect initial demographic data about the study participants. Variables included: the age of the parents, the child's age, family size, and the type of social environment the family lives

in. It also included questions about certain conditions surrounding the child and family, such as the type of childbirth and the presence of other children with disabilities in the family.

Scale Description:

The verbal and non-verbal communication scales were used. These scales consist of nine dimensions assessing autistic behavior, and were developed and standardized on a sample of autistic children in Saudi Arabia.

The verbal communication scale consists of 43 items & the non-verbal communication scale consists of 40 items.

Application Method:

The scale was filled out by the child's parents in the presence of the researcher, with a mark (*) placed next to each statement, selecting the most appropriate response from the following options:

(Does not occur – Rarely occurs – Occasionally occurs – Often occurs – Always occurs).

Scoring Method:

Each item is scored based on a 5-point Likert scale as follows:

Does not occur = 0 / Rarely occurs = 1 / Occasionally occurs = 2 / Often occurs = 3 /Always occurs = 4

Thus, the total score ranges:

-Verbal communication scale: 0 to 172

-Non-verbal communication scale: 0 to 160

-Higher scores on either scale indicate greater communication deficiency.

Validity of the Scale:

Content validity was ensured by submitting the items to a panel of 11 experts. Only items that received 75% or more agreement were retained.

Reliability of the Scale:

Reliability was measured using test–retest method and internal consistency coefficient.

2. The Implemented Program

General Objectives of the Program:

The proposed program aims to develop communication skills in children with autism aged between 8 and 10 years, using a series of sessions based on group play activities designed by the researcher. These activities represent a form of group therapy that help in releasing emotional tension, acquiring various social skills, increasing effectiveness and guiding positive behavior toward others. The program also seeks to alleviate the psychological and social effects of disability, thereby improving adaptability

and achieving better mental health, leading to an enhanced quality of life within their social environment.

Procedural Objectives of the Program:

The procedural objectives can be summarized as follows:

-To identify the impact of group play activity sessions on the development of communication among the children in the study sample.

-To address and attempt to improve both verbal and non-verbal communication in children with autism.

Methods and Techniques Used in the Program

The researcher used several methods and techniques during the application of the program, including:

a) Reinforcement

Reinforcement involves strengthening desired behaviors by providing a stimulus that is appealing to the child. Reinforcers are categorized as follows:

1. Primary Reinforcers: Basic necessities such as food, drink, candy, etc.
2. Secondary Reinforcers: Items that are not inherently valuable but lead to desired outcomes, such as money or watching a favorite show.
3. Social Reinforcers: Praise, smiles, kisses, hugs, and any gesture indicating care and attention.
4. Attention-Grabbing Reinforcers: Toys, dolls, music, colorful visuals, and other stimulating elements (Malika Halwis Kamel, 1998).

The researcher primarily used primary and social reinforcers, with special emphasis on attention-grabbing reinforcers to strengthen desired behaviors.

b) Modeling

Modeling refers to the behavior demonstrated by an individual that serves as an example to be observed. It is closely linked to imitation, where a learner observes a behavior and replicates it, reflecting performance. It also relates to observational learning, in which a learner acquires knowledge by watching others—potentially without immediate imitation (Mahrous Al-Shennawi & Abdel Rahman & Mohamed El-Sayed, 1998).

The effectiveness of modeling as a therapeutic technique depends on the presence of a live model, where a person performs the desired behavior in a clear, practical way. The performance should be positively reinforced. Recent studies have highlighted the success of this method in fostering positive aspects of social relationships and encouraging social participation (Abdel Sattar Ibrahim, 1998).

The researcher applied this technique by acting as a model during activities and interactions with peers.

c) Role-Playing

The researcher implemented role reversal, in which, for example, a child playing the role of the son would switch to the role of the father, and vice versa. This approach allowed the researcher to focus attention on the desired behavior and its significance.

Role-play was used during movement story activities, allowing children to embody roles to promote socially appropriate communicative behavior.

d) Prompting (Cues)

1. Physical Prompting: Involves physically guiding the child's limbs to perform the intended action.
2. Gestural Prompting: Uses gestures along with verbal cues to clarify meaning—though overuse should be avoided unless the child understands them.
3. Verbal Prompting: Involves telling the child exactly what is expected using words (Malika Halwis Kamel, 1998).

The researcher used these prompting techniques during sessions to encourage participation in activities and promote interaction with peers. Small game activities were also incorporated at the beginning of sessions to help children bond and create a positive impression of the program.

III. Results

Statistical Analysis Tool:

The statistical analysis was carried out after applying the Shapiro-Wilk test to determine the normality of data distribution. The results showed a significance value of sig = 0.000, which is less than the threshold of 0.05, indicating that the data do not follow a normal distribution. As a result, a non-parametric test was deemed appropriate. The Wilcoxon Signed-Rank Test was used to assess differences between pre-test and post-test scores. This test evaluates whether there are significant differences between two related samples—in this case, the same group of children assessed at two points in time. Each participant has two scores: one before and one after the intervention. The Wilcoxon test is considered the non-parametric alternative to the paired t-test, especially when the sample size is less than 30.

Since the current study sample included 6 children diagnosed with mild autism, the Wilcoxon test was used. Using SPSS, the following values were calculated: means, standard deviations, positive and negative rank

means, calculated and critical Z-values, and the Wilcoxon significance value (sig), which was compared to the significance level threshold (Al-Bahi, 1978).

Analysis and Discussion of Results in Light of the First Hypothesis:

The first hypothesis stated:

There are statistically significant differences between the pre-test and post-test application of the team sports program on the verbal communication scale of children with autism compared to neurotypical children.

To verify this hypothesis, the Wilcoxon test was applied to detect significant differences between the means for small samples. The results were as follows:

Table (1) represents the results of the Wilcoxon Signed-Rank Test comparing the mean scores of the study sample on the verbal communication scale used in this research.

Data / Sample	Children's Pre-test Scores	Children's Post-test Scores	Differences Between the Two Measurements	Ranks of the Differences	Calculated T-value (Sum of Negative Ranks)	Tabulated T-value	Significance Value (sig)	Significance Level (Alpha)
Aya	120	115	5	3	2	1	0.15	0.01
noh	108	110	3	2				
Ali	98	100	2	1				

From Table (1), it is evident that Z = 2, where T represents the sum of negative rank signs. By referencing the statistical table for the Wilcoxon Signed-Rank Test, the calculated value (Z = 2) is greater than the critical value (Z = 1), and the significance value (sig = 0.15) is greater than the alpha level (0.01). This indicates that there are no statistically significant differences between the pre-test and post-test scores on the verbal communication scale.

Analysis and Discussion of Results in Light of the Second Hypothesis

The second hypothesis stated:

There are statistically significant differences between the pre-test and post-test application of the team sports program on the non-verbal communication scale of children with autism compared to neurotypical children.

To verify this hypothesis, the Wilcoxon Signed-Rank Test was again used to determine differences between the means in small sample sizes. The results were as follows:

Table (2) presents the results of the Wilcoxon test for determining the significance of differences in non-verbal communication scores among the study sample.

Data / Sample	Children's Pre-test Scores	Children's Post-test Scores	Differences Between the Two Measurements	Ranks of the Differences	Calculated T-value (Sum of Negative Ranks)	Tabulated T-value	Significance Value (sig)	Significance Level (Alpha)
Aya	100	80	20	1	0	1	0	0.01
noh	114	76	38	3				
Ali	96	81	25	2				

From Table (2), it is evident that Z = 0, where T represents the sum of negative rank signs. Referring to the statistical table for the Wilcoxon Signed-Rank Test, the calculated value (Z = 0) is less than the critical value, and the significance value (sig = 0) is less than the alpha level (0.01).

This indicates that there are statistically significant differences between the pre-test and post-test scores on the non-verbal communication scale, in favor of the post-test scores. These differences are statistically significant at the 0.05 level, confirming the effectiveness of the program in improving non-verbal communication skills in children with autism.

IV. Discussion

The results of the first part of the study suggest that **team sports activities are not effective in developing verbal communication skills** in children with autism. Other strategies, such as psychological follow-up and speech therapy (orthophonia), appear to have a more significant impact on enhancing verbal communication in autistic children.

However, the findings indicate that **group play activities created an environment of interaction, cooperation, emotional and social exchange** between children with autism and their neurotypical peers. These activities contributed to learning how to assist others in problem-solving, especially through the exchange of balls and the sharing of play roles and tools such as hoops, ropes, sticks, and flags. This impact was clearly observed during and after the implementation of the program, as evidenced by several behavioral indicators: increased eye contact during play ; expressions of joy during victory or goal scoring ; engagement in cooperative play ; emotional expression through socially appropriate behaviors such as clapping ; reduced anxiety and restlessness during interaction with others.

These results support the second part of the study, demonstrating that **team sports significantly enhance non-verbal communication skills** in children with autism.

Several researchers emphasize that learning through play, with a focus on non-verbal communication, is among the most suitable approaches for early intervention and behavior modification in autistic children (Al-Othman, Ibrahim).

In this regard, Weiss (1976) points out that **group play activities are highly effective** in modifying social behaviors in children with autism and disabilities in general. This is attributed to the **social interaction** inherent in group activities, which promote cooperation, engagement, and structured social situations aimed at modifying undesirable behaviors.

Play is one of the most natural and spontaneous daily activities in a child's life, serving as a means for comprehensive development. It allows the child to gradually explore the surrounding world—both real and imaginary—engaging with its elements, responding to its symbols, and satisfying innate developmental needs. Play stimulates attention, memory, recall of emotional-social experiences, role-playing, and acting out events, all within a **social and emotional communication context**.

Group play activities have successfully fulfilled this function for children with autism, providing an outlet for emotional expression and stress relief. Through play, children can express their inner conflicts, fulfill needs such as ownership, control, and independence, and enjoy freedom of self-expression (Al-Tayeb Mohamed Abdel-Zaher & Hassan Manal, 2001). Through play, children were able to **release aggressive energy**, whether directed at themselves or others. In doing so, play performed multiple functions:

- **Socially**, it expanded children's social experiences, provided them with frameworks for social interactions, and offered them rules to govern relationships with family and community.
- **Psychologically**, it strengthened self-concept, allowed expression of needs and desires, and promoted self-confidence and better interpersonal skills.

  Additionally, play served as a source of **recreation and emotional relief**, providing joy and comfort to the children.

V. Conclusion

Based on this study, which aimed to examine whether there are statistically significant differences between the pre-test and post-test applications of a team sports program on the communication scale in children with autism compared to neurotypical children, the findings indicate that there were statistically significant differences in non-verbal communication for autistic children who practiced team sports. However, no statistically significant differences were observed in verbal communication. This outcome was interpreted in light of the specific characteristics of children with autism and the nature and duration of the implemented program.

Accordingly, the study recommends: applying the program to a larger number of children with autism, extending the duration of program implementation, focusing on teaching socially appropriate communication skills outside traditional classroom settings, emphasizing the inclusion of children with autism alongside their neurotypical peers during physical activities, arts, mealtimes, and daily life routines, encouraging their active participation in group activities, including school assemblies.

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