

## The effectiveness of a training program based on the Higashi method in developing social interaction among children with autism disorders

Dr. Khaled Ahmad Obeidat<sup>a</sup>, Dr. Mohammad Ahmad Shehadah Alomari<sup>b</sup>, Prof. Mohammad Omar Abu AlRub<sup>c</sup>, Dr. Abd Alhameed Mahmoud Abu Issa<sup>d</sup>

<sup>a,b,c,d</sup> Special education department, Faculty of Educational sciences, Ajloun national university

<sup>a</sup> k.obeidat@yahoo.com, <sup>b</sup> dahleh.omari@gmail.com, <sup>c</sup> brtd\_sok@yahoo.com, <sup>d</sup> abedelhameedabuissa7@gmail.com

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**Abstract:** Introduction: Children with autism spectrum disorder suffer from problems in social interaction skills, which leads to their isolation and inability to integrate into society and the surrounding environment. Therefore, the study aimed to prepare a training program based on the Higashi method in developing social interaction skills for children with autism spectrum disorder. And verify its effectiveness in the measurements, pre-test, post-test and delayed test. Methodology: The study used the semi-experimental approach by adopting quantitative design. To achieve the objectives of the study, the scale of social interaction skills was used. And it consisted of 15 children, experimental and consisting of 15 children, and the scale was applied to them, and appropriate statistical analyzes were performed. The quantitative results were extracted through the multiple analysis of variance test, the accompanying analysis of variance test, and the single analysis of variance test. Results: The results showed the effectiveness of the training program through the development of social interaction skills. The results also resulted in the existence of statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the members of the control and experimental groups in the pre-test and post-test on the scale of social interaction skills, and also indicated that there were no statistically significant differences at the level of significance ( $\alpha = 0.05$ ). Among the mean scores of the experimental group members in the post-test and delayed-test on the scale of social interaction skills: The study contributes to the integration of children with autism spectrum disorder through the development of social interaction skills, activating the role of families and their involvement in developing the necessary programs for their children, and training specialists on how to prepare training and extension training programs and early intervention programs that help these children in developing the life skills necessary for their integration into society and to stay away from isolation and introversion.

**Keywords:** training program, autism spectrum disorder, Higashi method, social interaction

### 1. Introduction

The field of special education is considered one of the modern fields in the field of education and psychology compared to fields in this field such as developmental psychology, educational psychology, and social psychology, and the roots of that topic go back to the second half of the twentieth century. Psychology, education, sociology and medicine, and the field of special education aims to serve extraordinary individuals who deviate significantly from the general average of ordinary individuals in their mental, sensory, emotional, motor and linguistic development, which requires special attention from educators in this category of individuals through their diagnosis, developing educational programs and choosing suitable teaching methods for them (Al-Khatib, 2018).

Autism spectrum disorder is considered at the forefront of special education categories that need more care, training, and qualification of specialists qualified to deal with this category in order to improve their social, behavioral and communicative interactive skills and abilities and the possibility of their integration with their peers in society.

The American Society of Autism also believes that autism appears in its basic manifestations in the first thirty months of a child's life, and disorders affect the rate of growth and development and what follows them, the response to sensory stimuli, speech, language, cognitive abilities, and abilities related to people, events and things. The most developmental disorders affecting the main areas of the child's functional abilities, as it leads to his closure and withdrawal on himself (Al-Farhathi and Al-Tali, 2017).

In order to provide children with autism spectrum disorder with social skills that enable them to build social relationships and reduce undesirable behaviors, special education specialists and psychologists have tended to achieve the goal of integrating autistic children, as training programs are vital methods in improving the condition of these children and increasing their effectiveness. And their integration into society and the natural environment due to the diversity of activities in line with their desires and needs, and through good utilization of integrated activities based on behavioral theory and represented by the Higashi method that is based on playing, music and drawing, this program can contribute to the development of social interaction skills

The social characteristics are among the most important characteristics of children with autism spectrum disorder with regard to social interaction, as it is observed that a child with autism spectrum disorder begins to isolate and not communicate (El-Saadawi, 2017), not to play with peers, to be unable to communicate verbally, and he suffers from problems in the communicative aspect. Such as eye contact with the mother, failure to respond to the smile that she makes, screaming and unnatural crying if someone tries to approach or touch him (Al Najadat, 2013) And playing or laughing for no reason, and other symptoms that make attention to this segment a necessary and important concern in order to alleviate these symptoms and the possibility of making them adapt to disability and society, as well as helping and helping the family to coexist and deal with the autistic child with the least stress or psychological tension that falls on the family (Al-Khatib) , 2018)

When the Higashi School in Japan followed the method of movement therapy for autistic children through the daily curriculum for its students, which is known as daily life therapy and focuses on learning through groups and reducing individual learning, and the aim is to find a balance in the various areas of the autistic child and stabilize his emotions Behavioral and increase their social interactions, as it applies to children with autism three rounds of vigorous and active jogging for twenty minutes, in addition to their participation in various other activities such as football, climbing and cycling for an hour a day in addition to drawing and music skills (Ziadi and Sawar, 2017).

## 1.2 Research Problem

The problem of the current study stems from the continuous increase in the number of children with autism spectrum disorder in the Hashemite Kingdom of Jordan, as the prevalence rate is estimated at about 10 to 20 cases per 10 thousand births, with an annual increase of 2000 cases per year, and according to estimates, the number of people with autism is expected to reach 30 thousand cases (Al-Zureikat, 2016) (The Supreme Council for Disabled Persons Affairs, 2013). Dealing with children with autism spectrum disorder, raising their skill level and independence, and integrating them into the society in which they live has become a priority for the Hashemite Kingdom of Jordan because of the importance of these children no less than other ordinary children. Therefore, the researcher chose children with autism spectrum disorder in order to build an inclusive training program based on the Higashi method in developing interaction skills for children with autism spectrum disorder.

## 1.3 Research Question

1. What is the effectiveness of a training program based on the Higashi method in developing social interaction skills for children with autism spectrum disorder in the post-test and delayed test?

## 1.4 Research Objective

1. Verify the effectiveness of a training program based on the Higashi method in developing social interaction skills and its continued impact on the two delayed dimensional test .

## 1.5 research hypothesis

1- There are no statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the average scores of the members of the experimental and control groups in the pre-test and post-test on the scale of social interaction skills.

2- There are no statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the pre-test and post-test on the scale of social interaction skills.

3- There are no statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the post-test and delayed-test on the scale of social interaction skills.

## 1.6 Significance Of The Study

The importance of studying autism spectrum disorder is due to the increase in its prevalence rates, and its emergence in an important and sensitive stage in the child's life, and this requires further research and study on the reasons for its occurrence in an attempt to reduce the prevalence rates and reach the best treatment programs that enable parents and those working with this category of children to deal with them in a manner Effective (El-Sherbiny and Mustafa 2010).

## 1.7 Definitions Of The Study

1. The training program: It is a planned and organized program in light of scientific foundations to provide direct services to children with autism spectrum disorder (study sample) in order to help them develop social interaction skills.

2. The Higashi method: It is a method that emerged from the treatment philosophy of daily life developed by Dr. Kiyukitahara in Japan in 1964 with the conviction that children with autism spectrum disorder can be helped

to reach their maximum potentials and energies near their families and societies, and this method depends on education by tradition and relying on sports, Music and drawing, and an interest in group play in groups and the reduction of individual learning (Interview, 2016).

3. Social interaction skills are defined procedurally: they are the skills that a child with autism spectrum disorder performs to communicate with others and help him learn and build social relationships that enable him to face different situations and overcome the problems he faces in his daily life and reduce unwanted behaviors and help him in his integration in the community.

4. Autism spectrum disorder procedurally: It is a neurodevelopmental disorder that is defined by behavioral disorders that include disturbance in communication and social interaction, adherence to ritual patterns, and stereotypical activities. These symptoms appear in early childhood and limit daily functioning.

### 1.8 Limitations of the study

1. Temporal limits: The study was implemented in the first semester of the academic year (2020/2021).

2. Human Limits: This study was applied to a sample of children with autism spectrum disorder in Wasan Specialized Center for Autism Children, and a sample of ordinary children in the Success Story School in the governorate of Irbid. The study sample consisted of 30 children in the age group of 4-8 years.

3. Spatial boundaries: Wasan Specialist Center for Autism Children in Irbid Governorate

## 2. Theoretical framework and previous studies

### 2.1 Autism spectrum disorder definition

Autism is a word translated from Greek, where this word is divided into two parts, autos, meaning self or self, and ism, meaning abnormal state or closed-off, and this term means that autistic people carry an abnormal soul and isolate themselves. (Mustafa and El-Sherbiny, 2014) Autism is one of the most common developmental disorders at the present time, and its definitions have varied because there is no clear and explained cause for it so far and the large number of specialists working in this field. Kanner is considered the first to define autism in 1943 and is the first to use the term Early Childhood Autism. His definition of autism was based on the common characteristics that he reached from his studies on (11) children, which are withdrawal from social interaction, deaf memory, mutism or non-communicative use of speech, physical appearance, excessive desire to maintain symmetry, high sensitivity to stimuli. (Al-Zureikat, 2016). An interview (2016) indicates that autism spectrum disorder is a neurodevelopmental disorder characterized by the following manifestations according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) issued in 2013.

### 2.2 The prevalence of autism spectrum disorder

The Center of Diseases Control and Prevention (CDC, 2009) indicates that (1/175) one child suffers from the autism spectrum in America, and the number of people with autism is one and a half million people in America, and that this percentage is increasing according to the same center and statistics indicate until that percentage, it reached (1/88) children ([www.Autismspeaks.org](http://www.Autismspeaks.org)). It is present among all races, races and all groups of different economic and social status, and it is spread among males five times more than females (1-5). Among males its percentage is (1-54) and among females (1-252) as indicated by (CDC) in the studies that conducted in Europe, North America and Asia, the prevalence of autism is 1% (Al Najadat; Al-Zureikat, 2016). Prevalence rates increased in 2014 to 1 in 68 children and now it is 1 in 59 new births (Al-Sayed, 2020).

### 2.3 Causes of autism spectrum disorder

Recently, many theories have emerged that have addressed the causes of autism spectrum disorder, the most important of which are:

**Genetic theory:** The genetic theory explains the occurrence of autism spectrum disorder as being hereditary that occurs as a result of the transfer of genes from parents to children. Where a lot of research and studies confirmed in their results that genetics has a role in the occurrence of autism spectrum disorder, and in its results are indicators suggesting the role of genetics, as autism spectrum disorder is spread by (2-4%) among autistic children and parents.

Among the most important factors causing autism reported by Omar (2008) are the following:

1. Biological factors such as injury to the expectant mother during pregnancy / asphyxia during pregnancy / failure to control one side of the brain ball.
2. Psychological factors: Studies have focused on this factor on the parenting pattern of the mother and the lack of appropriate reinforcement for a child.

3. Organic factors and the study of a number of variables such as difficult births, defects in the biological system, and the vaccinations taken by the mother.

Environmental theory: The occurrence of autism spectrum disorder is attributed to environmental factors such as: the mother's infection with types of fevers associated with rubella, the mother's exposure to radiation doses, the occurrence of frequent bleeding accompanied by a prolapse after the third month, the mother took some drugs without the doctor's permission, the old age of the pregnant mother, pollution Environmental, especially with heavy metal compounds (such as lead and mercury, as well as smoking), and lack of oxygen to the fetus' brain

## **.2.4Autism spectrum disorder treatment**

### 1. Behavioral therapy

Behavior modification programs for children with autism spectrum disorder can be offered for the following reasons: (Chalabi, 2005)

- It provides an applied approach to research that focuses on the educational needs of children with autism spectrum disorder.

- It relies on learning basics, which can be easily learned by those who are not interested.

- Children with autism can be taught models of adaptive behavior in a short time. The behaviors that can be taught to autistic children are:

1. Language and Speech Learning Skills.
2. Adequate social behavior.
3. Diverse self-care skills.
4. Play with appropriate toys.
5. Pairing and reading.
6. Complex nonverbal skills through imitation.

Behavior therapy focuses on modifying the behavior of children with autism spectrum disorder using a variety of techniques such as reinforcement, shaping, sequencing, indoctrination, concealment, punishment, over-correction, differential reinforcement, and feedback.

Al-Khatib (2018) points out that behavioral therapy is based on learning theories, and its focus is that behavior that reinforces and that not reinforces disappears, and this is useful with people with autism spectrum disorder, and it needs to develop a list of negative behaviors that must be changed and positive that must be strengthened, and negative behavior It must lead to specific confinement and deprivation, while positive behavior is rewarded with what the child likes, according to a clear program that is defined and understood for the child, and this method must be followed with the child at home and school and every time with those who care for him, and its results are good and works in conjunction with drug treatment And evolutionary.

Among the most important programs that are based on behavioral therapy for children with autism spectrum disorder:

Lovaas program: The idea of the Lovaas program is based on identifying the previous and next stimuli after the child's response, then determining the child's strong or weak behaviors, then forming new skills through the regulation of stimuli and immediate reinforcement, as it depends on the sequence of skills in a gradual manner from easy to difficult and through access To form the desired response according to the standard of a correct response level higher than 60%, and the functional analysis is based on the assumption that many of the familiar behaviors issued by the child with autism spectrum disorder such as screaming, hitting and violence are an attempt to communicate or provoke the desired behavior, and in order to succeed in forming behaviors Desirable must focus on simultaneous reinforcement. (Al-Zureikat, 2016).

B-Picture Communication System (PECS):

### **The PECS program consists of six phases, as indicated by the agent (2012):**

1- The substitution phase with physical assistance: through which the child is taught to replace an image of his favorite thing (food, sweets, toys, hate ...) with this thing through the help of another person who is near the child.

2- The stage of extending the scope of automaticity: After the child has mastered the first stage, the second stage begins, which includes the communication partner gradually moving away from the child.

3- The stage of distinguishing pictures: in which the child is trained to distinguish between two or more pictures, to choose the image of the thing he wants.

4- The syntax stage: in which the child is trained to construct a simple sentence instead of using a single word, by adding an image that expresses "I want" and then the image of the reinforcer.

5- The stage of responding to the question "What do you want?": In which the child is trained to respond to the question "What do you want?" The child is asked to determine the image of the thing he wants.

6- Responsive and automatic comment phase: by answering various questions such as "What do you see?" "What do you hear?"

Teach Program: This program is concerned with the treatment and education of children with autism spectrum disorder and similar communication disabilities, as the service is provided to these children through the Teach Center in North Carolina in the United States of America, and these centers are managed by a specialized center at the University of North Carolina under the supervision of Scobler (1972) Schopler, one of the foremost researchers in the field of autism spectrum disorder.

Daily Living Therapy (Higashi Method): Group Coaching: This method was developed by Dr. KIYOHIGASHI at the Mursashino Higashi School in Tokyo for children with autism spectrum disorder and is based on the assumption that children with autism spectrum disorder can help in the best possible way. It is possible to achieve their maximum potential near the environment and the society in which they live, and through a group of children with similar cultural experience, the Higashi method is based on a group of collectively directed activities that are based on learning transferred from one child to another through a set of behavioral methods such as imitation, And reinforcement, And formation, and also based on a group of sports and movement activities at the rate of three times a day for 20 minutes each time and the gym once, and a number of outdoor group activities such as football and basketball for an hour a day are carried out with the participation of a group of ordinary peers, where sports activities help And physical exercise for children with autism spectrum disorder reduces unwanted behaviors and self-excitement, and also helps improve attention and exploit learning possibilities, and this is what was indicated by the study of Bayoumi (2008), the study of Mahmoud (2009) and the study of Abbas (2012). On music, drama, art, and gathering in public festivals.

## **2.5 Characteristics of children with autism spectrum disorder**

First: Behavioral characteristics: The behaviors, interests and activities shown by children with autism spectrum disorder are restricted and short-lived, as these children suffer from frequent and abnormal stereotypical movements of the body, whether the movements of the hands or fingers.

Second: Social characteristics: Social skills are of great importance for children with autism spectrum disorder, from here the Fifth Diagnostic and Statistical Manual of Mental Disorders (DSM V) identified social skills as one of the most important criteria and criteria for diagnosing autism spectrum disorder, and they are as follows:

Deficiency and deficit in social and emotional interaction skills, to varying degrees.

Deficiencies and deficits in verbal and non-verbal communication skills related to social interaction skills.

Failure and inability to develop and maintain social relationships in comparison to normal children who are in his developmental level (chronological age) (American Psychiatric Association, 2013).

Third: mental and cognitive characteristics: more than 70% of children with autism spectrum disorder show low mental capabilities that reach the limits of mental disability and at other times reach moderate and severe mental disability, and 10% of these children show high mental abilities in some Aspects such as art and music, memory, and arithmetic or they may show early automatic reading abilities without comprehension.

Fourth: Linguistic characteristics: Language is defined as a system of symbols agreed upon between individuals, certain groups and a specific culture, and this system is characterized by preciseness and organization according to specific rules, which are spoken symbols used in expression and communication between members of this class (Al-Sayed, 2020).

### **The most important teaching principles on which the Higashi method is based**

- Physical sport: as it is a cornerstone of the program and may last from 20 minutes to two and a half hours, distributed in intermittent periods daily, and this is based on the assumption that when the individual practices a certain sport, the body secretes chemicals called endorphins that help reduce the level of tension and the stereotypical movements that often It appears in people with autism spectrum disorder.

- Higashi: it is an organized series of movements that follow the rhythm of musical notes.

-The sport of the rudimentary and advanced physical positions, where we find when students enroll in the school that specialists train them to accomplish certain physical conditions when asked to do so, and at any time during the day, on the assumption that the physical conditions help children to follow orders and organize the learning process.



- Moving and organizing: There are several methods used in Higashi School to help children move and organize, which are difficult tasks for children with autism spectrum disorder, including

1. Change clothes with hijabi school uniform
2. The basic schedule, which is the use of tables for each student, which shows everything the child does during his school day.
3. Writing the lesson steps on the board in order to clarify the working steps and the tools used.
4. Clarify the beginning and end of each lesson or activity that children do using the previous sport.

-Special Topics: It includes art and music education, which is one of the most important pillars of the Higashi program, in addition to some training on reading and writing, but special topics are given great importance (painting and music).

- Social skills: It is based on the philosophy of the program by relying on forming social relationships and bonds with others through activities, practice and repetition.

- Behavior management: It is derived from the philosophy of the program and is considered a preventive approach aimed at teaching children self-control, and designing the study environment in a way that contributes to reducing levels of stress and anxiety in children.

- Sports games: Psychologists have paid wide attention to the study of the natural development of the child, with a wide interest in describing and classifying play according to reality. The psychologist (Stern) specialized in child psychology divided play into individual play and group play. A source of pleasure for children, and Freud used play in psychotherapy and applied his views on play and its effects in the different types of therapy used from the theory of psychoanalysis, and this had clear and direct effects on children with a mental disorder, as he used automatic play and imaginative play in most types of psychotherapy as the scientist used Hermann Hagg the phenomenon of play in the treatment of mentally disturbed children (Al-Khatib, 2018).

## 2.6 Previous studies

The study of Al-Kuwari (2007) aimed to know the effect of a program based on the Higashi method based on sport and art in developing communication and social skills among autistic children in Qatar. The study consisted of (5) children suffering from autism and then the study scale was applied to them twice before, after and after completion. From the program, the Wickelkson test was applied, and the results indicated that there are statistically significant differences between the two tests , pre and post, in communicative skills of autistic children in favor of the post-test, as it was found that the average of the ranks was higher than the average of the positive ranks, and this is an indication that there is a statistically significant improvement in communication skills Students as a result of being exposed to the experimental treatment. There are also statistically significant differences between the pre-test and post-test in social skills. Where it was found that the average of the negative ranks was higher than the average of the positive ranks, and this is an indication that there is a statistically significant improvement in students 'communication skills as a result of their exposure to positive treatment.

Khattab (2010) conducted a study aimed at preparing a treatment program with play to reduce the severity of some behavioral disorders in a sample of autistic children. The study sample consisted of (10) autistic children as an experimental group and (10) children as a control group, and the age range ranges from (10-12) (A year), and the results showed that there are statistically significant differences between the members of the control and experimental group after applying the treatment program with play, and that the movement and sensory games have a tremendous ability in helping children with monotheists increase their ability to pay attention and communicate, which in turn helped reduce the severity of behavioral disorders effectively.

Nasr's study (2011) aimed at identifying the effectiveness of an early intervention program based on the Flortime model for children with autism spectrum disorder in developing the level of playing skills, and the researcher used the experimental approach, and the study sample consisted of (10) children who were divided into two control and experimental groups. The results indicate that there are statistically significant differences between the average scores of the experimental group and the control group in favor of the experimental group, and the existence of statistically significant differences between the average scores of the experimental group in the pre-test and post-test in favor of the post-test, and there are no statistically significant differences between the average scores of the experimental group in the post-test and delayed-test.

The study of AsmaMetwally (2012) aimed to find out the effectiveness of a program of play therapy in reducing the severity of some behavioral disorders in autistic children. The study included the weak ability to relate to people - the weak ability to imitate - the weak ability to communicate non-verbally - hyperactivity, aggression, anxiety and tension in a sample of children Autisms who were tested on the Child Autism Scale (cars)

and their number reached 10 children, as the program was applied to them using a set of therapeutic games accompanied by some behavior modification techniques. The results resulted in the effectiveness of the Play Therapy program in reducing the degree of behavioral disorders among the study sample and the continuation of the program's effect. After stopping for a limited period of time.

A full study (2017) also aimed to reveal the effect of joint attention training on improving social skills and verbal communication skills in children with autism spectrum disorder. The study sample consisted of 8 high-functioning autistic children whose ages ranged between (108-132) months with an average of (122.8) With a standard deviation of 9.21, the sample consists of two groups of equal numbers, each of which includes four children, one of them is an experimental one on which the program was applied and the other is a control. The social skills scale and the teacher appreciation scale were used for verbal communication in children with autism spectrum disorder. The results indicated that there were statistically significant differences between the mean ranks of the members of the control and experimental groups in social skills in the post-test in favor of the experimental group, and the presence of statistically significant differences between the average ranks of the members of the control and experimental groups. In verbal communication in the post-test in favor of the experimental group and the presence of statistically significant differences between the average ranks of the experimental group members in social skills in the pre-test and post-test in favor of the post-test, and the presence of statistically significant differences between the average ranks of the experimental group members in verbal communication in the pre-test and post-test in favor of the post-test.

The ovaries study (2018) aimed to assess the level of cognitive performance and social interaction among a sample of children with autism spectrum disorder in Jordan. The study sample consisted of 10 children with autism spectrum disorder whose ages ranged between 15-16 years. In order to achieve the objectives of the study, the researcher built The social interaction scale and the cognitive performance scale, in which the indications of validity and consistency were verified for both, and to answer the study questions, arithmetic averages, standard deviations, and the Mann and Tiny U test were used, as the results indicated that the level of performance on the social interaction scale and its paragraphs and the cognitive performance scale and its items came at an average level. The results also indicated that there were no statistically significant differences on the scale of social interaction and cognitive performance according to the variable of age, and the study recommended the necessity of providing treatment programs to develop social interaction and cognitive performance for children with autism spectrum disorder.

### **2.7 Commenting on previous studies**

She emphasized the importance of using the Higashi method in developing the social skills of children with autism spectrum disorder along with the study of Al-Kuwari (2007), and studies that emphasized the importance of using sports play in developing communication skills and social interaction and reducing some stereotypical and behavioral disorders such as a discourse study (2010) - Metwally (2012) as well. The Sheikh's study (2015) emphasized the importance of play in developing sensory perception and reducing repetitive motor behaviors in an autistic child.

The current study agrees with the study of Al-Kuwari (2007) in terms of its use of the Higashi method and the development of social interaction skills in children with autism spectrum disorder, as well as the study of speech (2010) and the study of AsmaMetwally (2012) Study (2015) on the importance of motor games in developing social skills And reducing behavioral disorders and developing sensory perception, in terms of the target group, who are children with autism spectrum disorder.

The Najadat and Zureikat study (2016) addressed the importance of training in functional communication in reducing unwanted behaviors and developing social skills. The study of Ghoneim and Al-Banshawi (2016) examined the role of psychodrama in developing social interaction in children with autism spectrum disorder, and a full study (2017) examined the impact of Joint attention exercises improve social skills and verbal communication skills in children with autism spectrum disorder.

The current study, Najadat and Al-Zureikat (2016), Ghoneim and Al-Banshawi (2016), and Kamel (2017), agree on the importance of diversity in providing programs that develop social interaction skills among children with autism spectrum disorder.

### **The extent to which the current study is distinguished from previous studies:**

The current study is distinguished from previous studies in that it is based on a training program that aims to develop motivation, response to multiple signals, self-initiative, and self-control by combining it with the Higashi method, which includes many diverse sports, musical and artistic activities to cover the tendencies and abilities of children with autism spectrum disorder. Different each according to his tendencies and abilities, there are some children who do not respond to drawing They tend to music, and some of them tend to engage in motor activities,

and thus the diversity of activities provides the opportunity for the child to choose the activity that suits him. This study is also based on the behavioral theory through the use of the Higashi method that depends on the behavioral approach which is induction, imitation, modeling, fading, and differential reinforcement of alternative behavior, And extinguishing, as the current study is distinguished by that it seeks to develop the social interaction skills of children with autism spectrum disorder through a training program based on the Higashi method, and this is what none of the previous studies have done.

### **3. Method and procedures**

#### **3.1 Study methodology**

The current study is based on the semi-experimental approach that depends on selecting an intentional sample from the original community and is based on the design of the tribal and post-test and depends on two experimental and control groups. This approach also takes into account the control of the conditions surrounding the experiment in terms of determining the time of the experiment and the physical factors during the application and the psychological conditions metric for the sample before Starting to apply the experiment so that all of these factors are equivalent to the control and experimental groups, as the current study seeks to find out the effect of the independent variable on the dependent variable (Al-Rousan, 2014).

#### **3.2 Study community and sample**

The study population consisted of all children with autism spectrum disorder in the special education centers of the governorate of Irbid during the second semester of 2020/2021.

As for the study sample, it was chosen by the intentional method from the Wasan Specialist Center for People with Special Needs.

#### **3.3 Sample selection method and homogeneity**

The study sample was deliberately chosen from the study population, where the study sample consisted of (30) children with autism spectrum disorder and was randomly distributed into two control groups and it consisted of (15) children with autism spectrum disorder, and an experimental consisted of (15) One of the children with autism spectrum disorder was combined with (15) normal children, and children with autism spectrum disorder were diagnosed based on the foundations and criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-v) fifth edition) and whose ages ranged between (6-8) years Those who are classified as children with autism spectrum disorder, and who do not suffer from associated disabilities, whether they are mental, visual, movement or any other disability, And those who did not undergo any program before and among the children with autism spectrum disorder who show deficiencies in the skills of social interaction and showed some aggressive behaviors by referring to the files and personal records of children and applying the two measures of social interaction skills, as there was parity between the experimental and control groups in terms of number. And the level of social interaction.

#### **3.4 Study tools**

##### **1. Social Interaction Skills Scale:**

The aim of the scale: To measure the extent to which children with autism spectrum disorder possess the skills of social interaction.

**Scale dimensions:** playing with others, greeting others, making friends with others.

##### **Measure construction procedure:**

- A review of the theoretical literature on the topic of social interaction skills.
- Scales related to autism spectrum disorder, such as the Gilliam Scale for Autism, and the Autism Rating List, were reviewed to extract a number of appropriate paragraphs for the purposes of the study with modification, addition, deletion or reformulation in line with the current study.

##### **The validity of the scale of social interaction skills**

To verify the validity of the scale, it was presented to a group of arbitrators, including university professors who specialize in special education, psychology, and mental health :

- The linguistic formulation and its integrity.
- The suitability of the test paragraph to the field it falls under.
- Linguistic accuracy.



**Stability of the scale of social interaction skills**

The stability of the social interaction skills scale was verified by applying it to an exploratory sample of (12) children from the study population and outside its sample. The Cropnach alpha equation was used to estimate the scale's stability coefficient, which was (0.86). The stability coefficients for the three dimensions ranged between (0.77 - 0.83), which is acceptable to conduct the study, as the correlation coefficient that exceeds (0.6) is a guarantor of slope vis-à-vis the stability of the used tool (Odeh, 2010). Table (1) shows the stability coefficients for its three dimensions, which are (playing with Others, greeting others, making friends with others).

**2. The training program**

To design a training program based on the Higashi method in developing social interaction among children with autism spectrum disorder in Irbid Governorate. The current study followed a set of steps to design the training program:

1. Building the "proposed training program" in its first form.
2. Presenting the "training program" to a group of arbitrators
3. Determine the social characteristics of children they have
4. Ensure the validity of the program
5. Ensure the stability of the program

**3.5 Study variables**

**The independent variable:** the training program based on the Higashi method

**Dependent variables:** social interaction in children with autism spectrum disorder.

**3.6 Statistical methods used**

To achieve the objectives of the study, the Statistical Package for Social Sciences (SPSS) program was used to analyze data and obtain results, as follows:

- Arithmetic means and standard deviations.
- Krupnach's alpha equation.
- Concomitant Multiple Analysis of Variance (MANCOVA) test.
- An Associated Single-Test (ANCOVA) test.
- Multiple analysis of variance (MANOVA) test.

**4. Results**

**4.1 Answer study questions**

Results related to the first question: "How effective is the training program based on the Higashi method in developing social interaction among children with autism spectrum disorder in the post-test and delayed-test ?"

Derive from this question the following hypotheses

First: The first null hypothesis "There are no statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the members of the experimental and control groups in the pre-test and post-test on the scale of social interaction."

To answer this hypothesis, the arithmetic averages and standard deviations of the performance of the study sample individuals on the measure of social interaction in the experimental and control groups were extracted and to reveal the differences in the pre-test and post-test according to the group variable (experimental, control), as shown in Table (1):

**Table (1):** The arithmetic means, standard deviations, adjusted averages, and standard errors of the scores of members of the control and experimental groups in the pre-test and post-test on the scale of social interaction.

		Per-test		post-test			
Dependent variable	the group	Arithmetic	standard	Arithmetic	standard	Adjusted	Standard errors
(Social interaction)		mean	deviation	mean	deviation	deviation	arithmetic means
errors							

Playing with others (score of 44)	Control	15.27	3.39	24.07	2.71	24.34	0.81
	Experimental	16.87	3.20	35.13	3.50	35.13	0.81
Gree others (score of 16)	Control	5.20	0.94	8.53	0.83	8.49	0.26
	Experimental	5.07	1.16	11.33	1.23	11.38	0.25
Make friends others (score out of 20)	Control	6.33	1.29	6.13	1.18	9.13	0.22
	Experimental	5.93	1.28	15.53	1.45	15.60	0.22
A measure of social Interaction as a whole (Score of 80)	Control	26.80	4.83	41.60	2.61	41.76	0.86
	Experimental	27.87	5.10	62.27	5.29	62.10	0.86

Table (1) shows the existence of differences in the performance of members of the control and experimental groups in the pre-test and post-test on the scale of social interaction. To demonstrate the significance of the statistical differences between the means, the associated multiple analysis of variance test (MANCOVA) was used. Table (2) illustrates these results.

**Table (2):** Results of the accompanying multiple analysis of variance (MANCOVA), for the performance of members of the control and experimental groups on the social interaction scale for children with autism spectrum disorder

The source of the contrast	Dimensions scale	Sum of squares	Degrees of freedom	Average of squares	F value	Indication level	Impact size (Partial ETA box)
Play with Others in the pre-test	Play with Others in the post-test	21.229	1	21.229	2.428	0.132	0.089
	Greeting Others in the in post-test	0.017	1	0.017	0.019	0.019	0.001
	Make Friends With Others in the post-test	0.493	1	0.493	0.762	0.391	0.030
Greeting Others in the pre-test	Play with Others in the post-test	0.190	1	0.190	0.022	0.884	0.001
	Greeting Others in the post-test	2.270	1	2.270	2.557	0.122	0.093
	Make Friends With Others In	3.945	1	3.945	6.099	0.021	0.196

	the post -test						
Make Friends With Others in the pre-test	Play with Others in the post-test	0.380	1	0.380	0.043	0.837	0.002
	Greeting Others in the in post-test	0.533	1	0.533	0.600	0.446	0.023
	Make Friends With Others in the post -test	4.719	1	4.719	7.296	0.012	0.226
Hotelling =2.95 F=21.602 H=0000	Play with Others in the in post-test	705.717	1	705.717	80.704	0.000	0.763
	Greeting Others in the in post-test	50.598	1	50.598	56.992	0.000	0.695
	Make Friends With Others in the post -test	259.056	1	259.056	400.537	0.000	0.418
The error	Play with Others in the post-test	218.613	25	8.745			
	Greeting Others in the post-test	22.195	25	0.888			
	Make Friends With Others in the post -test	16.169	25	0.647			
Adjusted total	Play with Others in the post-test	1237.867	29				
	Greeting Others in the in post-test	356.667	29				
	Make Friends With Others in the post -test	356.667	29				

Table (2) shows the existence of statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages at the distance of playing with others in the post-test due to the group in favor of the experimental group, where the value of (P) was (80.704). Through the modified averages shown in Table (1), the dimension of playing with others in the dimensionality of the experimental group was (35.13) compared to (24.34) for the control group, meaning that the members of the experimental group enjoyed playing with others better than the control group, and the matter that shows the effect of using the training program. It is clear from Table (2) that the value of the partial ETA box for playing with others (0.763), which is the size of the training program effect, explains (76.3%) of the explained variance in after playing with others, and the rest (unexplained) is attributed to other variables.

Table (2) shows that there are statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic means on the dimension of greeting others in the post-test due to the group in favor of the experimental group, where the value of (P) was (400,537). Through the modified averages shown in Table (1). Whereas, the dimension of greeting others in the dimensional measurement of the experimental group was (11.38) compared to (8.49) for the control group, meaning that the members of the experimental group have the ability to greet others better than the control group, which shows the effect of using the training program. It is clear from Table (2) that the value of the partial ETA square to greet others (0.695), which is the size of the training program effect, explains (69.5%) of the explained variance in the dimension of greeting others, and the rest (unexplained) is attributed to other variables.

Table (2) also shows the existence of statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages after making friends with others in the post-test due to the group in favor of the experimental group, where the value of (P) was (56.992). Through the modified averages shown in Table (4). The dimension of making friendships with others in the dimensional measurement of the experimental group was (15.60) versus (9.06) for the control group, meaning that the members of the experimental group have the ability to make friends better than the members of the control group, which shows the effect of using the training program. It is clear from Table (2) that the value of the partial ETA square for making friends with others (0.841), which is the size of the effect of using the training program, is explained (84.1%)Of the variance explained in having made friends with others, the rest (unexplained) is attributable to other variables.

An accompanying single-group analysis of variance (ANCOVA) was also used for the differences between the scores of the members of the control and experimental groups on the post-social interaction scale, according to the difference of the group variable, as the results were, as shown in Table (3).

**Table (3)** the results of the test of the accompanying analysis of variance (ANCOVA) for the differences between the averages of the control and experimental groups in the pre-test and post-test on the scale of post social interaction by group.

Dependent size level	The source Variable (Partial) ETA box	Sum of	Degrees of of the	Average of squares	F value	Indication freedom	Impact squares
Social interaction scale in poet-test	Social interaction Scale in pry-test	239.239	1	239.239	25.911	0.000	0.490
0.238	the group	2974.820	1	2974.820	322.190	0.000	
	Error	249.294	27	9.233			
	Adjusted total	3691.867	29				

Table (3) shows that there are statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages on the Dimensional Social Interaction scale due to the group in favor of the experimental group, where the value of (P) was (322.190). Through the modified averages shown in Table (1). The dimensional social interaction measure for the experimental group was (62.10) versus (41.76) for the control group, meaning that the members of the experimental group have better social interaction skills than the control

group, which shows the effect of using the training program. It is clear from Table (3) that the value of the partial ETA square for the Dimensional Social Interaction Skills Scale (0.823), which is the size of the effect of using the training program, explains (82.3%) of the explained variance in the Dimensional Social Interaction Skills Scale, and the rest (unexplained) is attributable to other variables.

Based on the results, the first null hypothesis was rejected, which states: "There is no statistically significant difference at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the members of the experimental and control groups in the pre-test and post-test on the scale of social interaction skills.

Acceptance of the alternative hypothesis that includes "there is a statistically significant difference at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the members of the experimental and control groups in the pre-test and post-test on the scale of social interaction skills."

Second: The second null hypothesis, "There are no statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the pre-test and post-test on the scale of social interaction skills."

To answer this hypothesis, the arithmetic averages and standard deviations of the performance of the members of the experimental group were extracted on the scale of social interaction skills to reveal the differences in the pre-test and post-test according to the application variable (pre and post), as shown in Table (4):

**Table (4)** Arithmetic averages, standard deviations, adjusted averages, and standard errors of the scores of the experimental group members for the pre-test and post-test on the scale of social interaction skills.

Dependent variable (aggressive behavior)	the application	Arithmetic mean	standard deviation	Arithmetic mean	Standard errors errors
Playing with others (score of 44)	post-test	16.87	3.20	16.87	0.86
	Per-test	35.40	3.50	35.40	0.87
Gree others (score of 16)	post-test	5.07	1.16	5.07	0.31
	Per-test	11.33	1.23	11.33	0.31
Make friends others (score out of 20)	post-test	5.93	1.28	5.93	0.35
	Per-test	15.53	1.46	15.53	0.35
A measure of social Interaction as a whole (Score of 80)	post-test	27.87	5.10	27.87	1.34
	Per-test	62.27	5.30	62.27	1.34

Applied Table (4) shows that there are differences between the average performance of the members of the experimental group in the pre-test and post-test on the scale of social interaction skills. To demonstrate the significance of the statistical differences between the means, the multiple analysis of variance (MANOVA) test was used. Table (5) illustrates these results.

**Table (5)** results of the multiple analysis of variance (MANOVA), for the performance of members of the experimental group on the scale of social interaction spectrum skills in the pre-test and post-test of children with autism spectrum disorder



The source of the contrast	Dimensions scale	Sum of squares	Degrees of freedom	Average of squares	F value	Indication level	Impact size (Partial ETA box)
The application	Play with Others in	258.133	1	258.133	228.748	0.000	0.791
	Greeting Others	294.533	1	294.533	204808	0.000	0.780
	Make Friends With Others	691.200	1	691.200	367.473	0.000	0.829
	Scale of interaction skills as a whole	8875.200	1	8875.200	367.473	0.000	0.821
Hotelling =15.029							
F=116.200							
H=0.0000							
The error	Play with Others in	315333	28	11262			
	Greeting Others	40267	28	1438			
	Make Friends With Others	52667	28	1881			
	Scale of interaction skills as a whole	752667	28	27.024			
Adjusted total	Play with Others in	2831467	29				
	Greeting Others	334.800	29				
	Make Friends With Others	743.867	29				
	Scale of interaction skills as a whole	9631.867	29				

Table (5) shows the existence of statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages at the distance of playing with others due to the application, as the value of (P) reached (228.748). Through the modified averages shown in Table (4). The dimension of playing with others for the post application was (35.40) compared to (16.87) for the pre-application, meaning that the group members in the post application enjoyed the ability to play with others better than the pre-application, which shows the effect of using the program. It is clear from Table (5) that the value of the partial ETA box for playing with others (0.791), which is the size of the effect of using the program, explains (79.1%) of the variance explained in after playing with others, and the rest (unexplained) is attributed to other variables.

Table (5) shows that there are statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic means on the dimension of greeting others due to the application, as the value of (P) reached (204.808). Through the modified averages shown in Table (4). The greeting of others dimension for the post application had (11.33) versus (5.07) for the pre-application, meaning that the group members in the post application enjoyed the ability to greet others better than the pre-application, which shows the effect of using the program. It is evident from Table (5) that the value of the partial ETA square to greet others (0.780), which is the size of the effect of using the program, explains (78.0%) of the explained variance in the dimension of greeting others, and the rest (unexplained) is attributed to other variables.

And the presence of statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages after making friends with others due to the application, as the value of (P) was (367.473). Through the modified averages shown in Table (4). The dimension of making friends with others for the post application had (15.53) versus (5.93) for the pre-application, meaning that the group members in the post application had the ability to form friendships better than the tribal application, which shows the effect of using the program. It is clear from Table (5) that the value of the partial ETA square for making friends with others (0.829), which is the size of the program’s effect, explains (82.9%) of the variance explained in having friendships with others, and the rest (unexplained) is attributed to other variables.

Table (5) also shows the existence of statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages on the scale of social interaction skills as a whole due to the application, where the value of (P) was (328.421). Through the modified averages shown in Table (4). The scale of social interaction skills as a whole for the post application had (62.27) compared to (27.87) for the pre-application, meaning that the group members in the post application had better social interaction skills than the pre-application, which shows the effect of using the program. It is evident from Table (5) that the value of the partial ETA square for the scale of social interaction skills (0.821), which is the size of the effect of using the program, explains (82.1%) of the explained variance in the scale of social interaction skills, and the rest (unexplained) is attributed to other variables.

Based on the results, the second null hypothesis was rejected, which states: “There is no statistically significant difference at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the pre-test and post-test of social interaction skills before and after the implementation of the program.

Acceptance of the alternative hypothesis that includes "there is a statistically significant difference at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the pre-test and post-test of social interaction skills before and after the implementation of the program.

Third: The third null hypothesis "There are no statistically significant differences at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the post-test and delayed-test on the scale of social interaction skills."

To answer this hypothesis, the arithmetic averages and standard deviations of the performance of the children of the experimental group were extracted on the scale of social interaction skills, and the differences in the post-test and delayed-test were revealed according to the application variable (post, delayed), as shown in Table (6):

**Table (6)** the arithmetic means, standard deviations, modified averages, and standard errors of the scores of the members of the experimental group for the post-test and delayed-test on the scale of social interaction skills.

Dependent variable (aggressive behavior)	the application	Arithmetic mean	standard deviation	Arithmetic mean	Standard errors errors
Playing with others (score of 44)	post-test	35.40	3.501	35.40	0.90
	Delayed -test	36.00	3.505	36.00	0.90
Gree others (score of 16)	post-test	11.33	1.234	11.33	0.29
	Delayed -test	12.13	0.990	12.13	0.29
Make friends others (score out of 20)	post-test	15.353	1.457	15.53	0.39
	Delayed-test	15.60	1.595	15.60	0.39
A measure of social Interaction as a whole (Score of 80)	post-test	62.29	5.298	62.29	1.36
	Delayed -test	63.73	5.253	63.73	1.36

Table (6) shows the existence of apparent differences in the performance of the experimental group members in the post-test and delayed- test of the scale of social interaction skills. To demonstrate the significance of the statistical differences between the means, the multiple analysis of variance (MANOVA) test was used. Table (7) illustrates these results.

**Table (7)** the results of the multiple analysis of variance (MANOVA), for the performance of the experimental group members on the scale of social interaction skills for children with autism spectrum disorder in the post-test and delayed-test

The source of the contrast	Dimensions scale	Sum of squares	Degrees of freedom	Average of squares	F value	Indication level	Impact size (Partial ETA box)
The application	Play with Others in	2.700	1	2.700	0.220	0.643	0.008
	Greeting Others	4.800	1	4.800	3.338	0.060	0.120
	Make Friends With Others	0.033	1	0.033	0.014	0.905	0.001
Hotelling =15.029							
F=116.200	Scale of interaction skills as a whole	16.133	1	16.133	0.579	0.453	0.020
H=0.0000							
The error	Play with Others in	343.600	28	12.271			
	Greeting Others	35.067	28	1.252			
	Make Friends With Others	65.333	28	2.333			
	Scale of interaction skills as a whole	779.867	28	27.852			
Adjusted total	Play with Others in	346.300	29				
	Greeting Others	39.867	29				
	Make Friends With Others	65.367	29				
	Scale of interaction skills as a whole	796.000	29				

Table (7) shows that there are no statistically significant differences at the level of statistical significance ( $\alpha = 0.05$ ) in the arithmetic averages on all dimensions of the social interaction skills scale, and the scale as a whole is due to the application.

Based on the results, the third null hypothesis was accepted, which states: “There is no statistically significant difference at the level of significance ( $\alpha = 0.05$ ) between the mean scores of the experimental group members in the post-test and delayed-test on the scale of social interaction skills.”

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**Interpretation and discussion of findings, recommendations and contributions**

Discussion related to the first question: "How effective is the existing training Hegashi method in developing social interaction skills for children with autism spectrum disorder in the post-test and delayed-test?"

The results indicated that there are statistically significant differences in the distance of playing with others in the dimensionality in favor of the experimental group, meaning that the members of the experimental group enjoy playing with others better than the control group, which indicates the effect of using the training program.

The current study believes that this result confirms the importance of the training program based on the Higashi method in developing social interaction skills for children with autism spectrum disorder, as play is of great importance for the child to learn behaviors and interact with others.

It is worth noting that there is an important effectiveness of programs that are based on play in improving the level of social interaction in children with autism spectrum disorder, and in this the study of speech (2010) showed that the programs of movement and sensory games have a tremendous potential in helping autistic children to increase their ability to pay attention and communicate, which in turn helped in effectively reducing the severity of behavioral disturbances.

Where the results of the study indicated that there are important differences between the two groups in the areas and axes of social interaction in children with autism spectrum disorder represented in playing with others, greeting others, and making friends with others, which are important axes and strong indicators of children's ability to interact. Educational institutes and institutions for children with autism spectrum disorder pay great attention to them, and according to (Al-Zureikat, 2016), educational institutes and institutions for children with autism spectrum disorder focus on care and treatment at psychological and social levels without the motor aspect.

It is a result consistent with the study of Al-Ruwaili and Al-Zureikat (2019), which concluded that there are statistically significant differences in the performance of the sample members on the study tools in favor of the experimental group that was subjected to a program.

The results also indicated that there were no statistically significant differences in the post-test and delayed-test on the scale of social interaction skills of the experimental group.

The results showed that there are slight differences between the degrees of the dimensions of the scale of social interaction skills (playing with others, greeting others, making friends) on the post-test and delayed-test, as we find that the differences between the arithmetic averages of the post-test and delayed-test of the members of the experimental group are very close, and this indicates the retention of individuals. The experimental group affected the impact of the training program after stopping the implementation of the program for a month. The current study attributes this stability to the effectiveness of the strategies and methods used in the program.

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