

The effectiveness of a Training Program based on the Pivotal Response to reduce aggressive behavior of children with autism spectrum disorder

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Abstract: Introduction: Children with autism spectrum disorder suffer from behavioral problems represented by aggressive behavior towards themselves and others, which leads to their isolation and their inability to integrate into society and the surrounding environment. Therefore, the study aimed to pre-test pare a training program based on the pivotal response in reducing the aggressive behavior of children with autism spectrum disorder. And verify its effectiveness in the pre-test and post-test and delayed test Methodology: The study used the semi-experimental approach by adopting quantitative design. To achieve the objectives of the study, aggressive behavior scale and training program were used. The sample of the study consisted of 30 children of autism spectrum disorder, who were randomly assigned to two control groups, and it consisted of 15 children and experiments and consisted of 15 children, The scale was applied to them, and appropriate statistical analyzes were performed. The quantitative results were extracted through the multiple variance analysis test, the accompanying analysis of variance test, and the single analysis of variance test Results: The results showed the effectiveness of the training program in reducing aggressive behavior. The results also resulted in 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 aggressive behavior scale in favor of the experimental group, and also indicated that there were no statistically significant differences at the level of significance ($\alpha = 0.05$) among the average scores of the experimental group members in the post-test and delayed test on the aggressive behavior scale Conclusion: The study contributes to reducing the aggressive behavior, and training specialists on how to pre-test pare training and counseling programs, and early intervention programs that help these children in developing life skills.

Keywords: training program, autism spectrum disorder, pivot response method, aggressive behavior

1. Introduction

Rearing children with special needs is one of the most difficult tasks entrusted to families and those interested in this field, as the birth of a handicapped child in the family is a great responsibility and challenges. The maximum degree of adaptation possible in various areas of life.

Special education is defined as one of the specialized educational programs that are provided to disabled children in order to help them raising their abilities to the highest possible level, in addition to their efforts in achieving themselves and helping them adapt (El-Sharkawy, 2018). Autism spectrum disorder is considered at the forefront of special education categories that need more care, training, and qualification of specialists and qualified to deal with this category in order to improve their interactive, social, behavioral and communication skills and abilities and the possibility of their integration with their peers in society (Al-Sayed 2020).

The American Psychiatric Association defines autism as a type of systemic developmental disorder that appears in the early years of a child's life and results in a defect in the central nervous system, which in turn affects brain functions and thus affects all aspects of development. Its symptoms are deficiencies in the skills, social interaction, and skills. Verbal and nonverbal communication, and stereotypical and behavioral problems (Al-Farhati and Al-Tali, 2017).

Children with autism spectrum disorder have no problems with aggressive behavior or responses to self-harm and harm to others (Kamel, 2017). Also, aggressive behavior is one of the most prominent characteristics of some children with autism spectrum disorder, as it is intentional and socially unacceptable behavior, and it can be observed and measured and appears in several forms, including physical aggression, and it is direct, indirect, continuous and repeated, and aims to harm oneself or others or material things and property. This behavior constitutes an obstacle for the autistic child in forming social relationships between him and the children on the one hand and the environment surrounding him on the other hand (Abdel Qader, 2010).

1.2 Research Problem

Autism spectrum disorder is one of the most severe and I think the disabilities that afflict children in the first years of life (Farhati and Tele) The percentage of autism spectrum disorder that remains without improvement is about 80%, and about 50% of children with autism spectrum disorder are unable to speak, 80% of them have a concomitant mental disability, and 60% of them have an IQ of less than 50% (Al-Zariqat, 2016).

Children with autism spectrum disorder suffer from aggressive behavior problems in early childhood and show excessive aggressive behavior towards oneself or others or possessions (Al-Badarana, 2016). He may hit his face with his fists, or his head against a wall, or with sharp pieces of furniture until his head becomes swollen (Brenna B Maddox et al, 2017).

The central response is also based on enhancing the social competence of the child with autism spectrum disorder by gaining attention, giving opportunities for motivation, attempts at reinforcement, taking the role, models of social behavior, and trying to self-control the aggressive behavior (Al-Zureikat, 2016).

1.3 Research Question

1. What is the effectiveness of a training program based on the pivotal response in reducing aggressive behavior in children with autism spectrum disorder?

1.4 Research Objective

The study sought through pre-test paring a program based on learning the pivotal response in reducing aggressive behavior in children with autism spectrum disorder.

1. To assess the effectiveness of a program based on learning the pivotal response in reducing the aggressive behavior and its continued impact on delayed and post-test .

1.5 research hypothesis

1. There is no statically differences at($\alpha = 0.05$) between control and experimental group on aggressive behavior scale.

2. There is no statically differences at($\alpha = 0.05$) in the scores of experimental group between pre-test and post-test on aggressive behavior scale.

3. There is no statically differences at($\alpha = 0.05$) in the scores of experimental group between delayed and post-test on aggressive behavior scale

1.6 Significance Of The Study

Hence the importance of the current study in focusing on teaching the axial response with play and sports as a treatment that helps children with autism spectrum disorder reduce their aggressive behaviors and try to reduce acute and abnormal behaviors in children with autism spectrum disorder.

1.7 Definitions Of The Study

1. The training program: It is a planned and organized training program in light of scientific foundations to provide direct services to children with autism spectrum disorder in order to reduce their aggressive behaviors

2. Procedural pivotal response: It is one of the forms of behavioral intervention (behavioral theory) through which a child with autism spectrum disorder is taught specific behavioral responses through environmental modifications that allow him to possess functional skills that help him adapt to the environment and the environment in which he lives.

3. Aggressive behavior: behavior that the individual makes verbally, morally, physically or materially, explicit or implicit, direct or indirect, active or passive, and this behavior results in physical or material harm and can be observed and measured and the severity varies from one person to another towards others a, Self or property.

4. Autism spectrum disorder procedural: A disorder represented by the child's inability to communicate in the early childhood stage of his life, and he exhibits aggressive behavioral reactions, withdrawal towards oneself and lack of interest in others.

1.8 Limitations of the study

The generalization of the study results was limited to the following limits:

1. Temporal limits: The study was applied 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 at Wesson Specialist Center for Children with Autism Spectrum Disorder. The study sample represents (30) children with autism spectrum disorder within the age group (4-8) years.

3. Spatial Limitation Wesson Center for Autism Children in Jordan.

4. The current study sought to build a training program based on learning the pivotal response in reducing aggressive behavior among children with autism spectrum disorder.

2. Theoretical framework and previous studies

2.1 Autism spectrum disorder definition

The American National Society of Autistic Children (NSAC) defined it as a disorder or syndrome that is defined as a behavioral disorder and includes disorders in the following areas: development, sensory response to stimuli, language and speech, cognitive abilities, attachment and belonging to events and topics (Al-Zureikat, 2016).

It is also known as a complex disorder that remains accompanying the child from the moment of its emergence and affects its normal development and appears in the form of defects in social, verbal and non-verbal communication skills and mental abilities and appears in the first years of the child's life (Ghazal Suleiman, 2015).

2.2 The pre-test valence of autism spectrum disorder

It can be said at the outset that there are no exact percentages of children with autism in the world, because the world depends mainly on what is noticed and shown, and some families may not expose or reveal their children for many reasons related, for example, related to the nature of society, gender, etc. Representing reality, and it can be said that the percentages mentioned in developed countries, although they are imprecise, are more representative than the percentages mentioned in developing countries. It should be noted that more research and studies have been conducted in developed countries than in developing countries. The spread of autism due to the different criteria used in diagnosing it, determining its symptoms and measuring its severity, due to the multiplicity of medical, educational and psychological backgrounds of specialists working in this field, and the number of individuals diagnosed with Autism Spectrum Disorder (ASD) has increased dramatically in recent years due to the improvement and expansion of the concept of autism. Diagnosis and inclusion of new classes for the class (Al-Zureikat, 2016).

2.3 Causes of autism spectrum disorder

Several theories emerged that dealt with the causes of autism spectrum disorder, the most important of which are:

Psychological theory: The psychological theory appeared in the fifties of the last century, when the followers of this theory believed that autism spectrum disorder was caused by psychological factors and that this disorder represented a state of isolation experienced by the child due to stagnation and indifference in the relationship between the spouses, and thus reflected on the mother and her child. The parents of these children are cruel and hostile towards their children, but this theory has met with opposition from those interested in the group of children with autism spectrum disorder, the most famous of which is (RIMLAND).

1. **Biochemical theory:** The biochemical theory assumes that autism spectrum disorder occurs as a result of the presence of a disorder in the materials that transmit nerve impulses such as amino acids, serotonin and dopamine. Research has indicated the relationship of autism spectrum disorder with neurochemical factors, which is represented by an increase or decrease in the secretions of the neurotransmitter (Hawamdeh, 2019).

2. **Biological theory:** This theory explains autism spectrum disorder as being caused by a defect in the central nervous system, and it is in the nerve centers in the brain, specifically in the cerebral cortex (cortex). This defect leads to sensory, linguistic, mental, and cognitive problems in children with autism spectrum disorder. Among the main reasons that lead to a defect in the central nervous system are the mother's taking of drugs and medicines, and lack of oxygen at birth (Mukhtar, 2019).

3. **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 taking 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.

2.4 Autism spectrum disorder treatment

The forms of treatments for autism spectrum disorder used are summarized as follows:

1. **Behavioral therapy:** Behavioral therapy depends on the systematic application of procedures based on learning principles with the aim of changing human behavior, and this is done by organizing and reorganizing the current environmental conditions and variables related to the behavior, especially those that occur after the

behavior. Behavior modification also includes providing evidence for that Actions alone and nothing else underlie the observed change in behavior (Boutros, 2010).

A. Luvaas Program in Applied Behavior Analysis: This program was called the Luvas program after the scientist Lovaas (Ivar Lofas) Professor of Psychiatry at the University of California, where he was the first to apply this type of teaching strategies on children with autism spectrum disorder, which is based on Behavioral theory, where Lovaas used behavioral modifications in training these children, and at the beginning of the seventies he developed an intensive program based on the method (applied behavior analysis).

B. Picture Communication System (PECS): This treatment method was used in the United States of America with children with autism spectrum disorder who suffer from deficiencies in speech and language communication skills. The idea of training in its early stages is to give the appropriate image to the mother or teacher when the child wants something. Such as giving a pigeon picture card if the child wants to go to the bathroom, or a picture of the game he prefers ... etc (Attia, 2014).

2.5 i teaching the pivotal response:

The treatment programs provided to children with autism spectrum disorder are based on a set of behavioral, psychological, social, educational and medical methods, according to the child's age and developmental status, as most of these treatment methods, which are based on scientific evidence, aim to develop and improve the manifestations of disability and deficiencies in communication and social interaction skills And reducing the unwanted behaviors and stereotypical behaviors shown by the child, in the event that the child overcomes these obstacles may help him to develop different skills more independently (Al-Khateeb, 2017).

The therapeutic axial response system is also based on the reward system, where the child chooses the activity or exercise that he wants to do, and the therapist must show the correct method and teach it to the child, and the specialist must review the skills that the child previously learned after periods of interruption and use the logical support of the child to properly direct towards Natural behavior. The pivotal response is based on four assumptions.

1. Parental intervention and preparation for the intervention: The families of children with autism spectrum disorder often have a lot of information about this disorder and the methods of intervention, but they do not actively participate in the preparation of programs provided for their children, so it is necessary to build bridges of communication between the school or the care center and the family to contribute to Improving children's skills, as parents can contribute to teaching their children basic and necessary skills such as interaction skills, social communication and independence skills, and the application of behavioral control procedures that are important in the treatment intervention and help increase learning opportunities, and their adaptation to their son, and alleviate psychological pressures as a result of the presence of an autistic child In the family (Al-Ruwaili, 2014).

2. Treatment in the natural environment: Children with autism spectrum disorder suffer from difficulty in maintaining learning skills, and the inability to acquire the necessary social and communication skills. Home, society) with the aim of developing early language and cognitive skills, imitation, appropriate social behavior, and reducing aggressive, ritual, stereotypical and tantrums behavior. In the first year of treatment, children are taught basic commands such as (imitation, playing with games, and interacting with the family). In the second year, the focus is on continuing to learn the language and learning to distinguish between emotions and learning by observation (Al-Khatib, 2017).

3. Therapy is a fundamental key to behavior and is the areas underpinning the pivotal response.

4. Application in the home and school environment If the main pillars of the pivotal response (motivation, self-initiative, multi-signal learning, and self-control) are applied in the home, school and community, the child is likely to have made gains in multiple areas (Al-Ruwaili, 2014).

2.6 Previous studies

Al-Ziyadat (2013) conducted a study entitled Cognitive-behavioral training program in the pivotal response in improving social interaction skills among a sample of autistic children in Jordan. The study sample consisted of 20 children selected by the intentional method, and they were divided into two experimental groups of 10 and 10 controls, whose ages ranged between 4-14 years. The researcher used the social interaction scale and the cognitive-behavioral training program in the pivotal response of autistic children prepared by the researcher. Statistically significant differences between the performance averages of the two study groups on the scale of social interaction skills between the experimental and control group according to the training program for the benefit of the experimental group.

Al-Ruwaili study (2014) aimed to reveal the effectiveness of a training program based on teaching the pivotal response in developing communication and social interaction skills in a sample of children with autism spectrum disorder. The study sample consisted of 30 autistic children, randomly distributed into two control groups 15 and an experimental 15 scale was applied. Communication skills and interaction skills measure prepared by the

researcher and the program based on the pivotal response prepared by the researcher. The results indicated that there are statistically significant differences in the performance of the sample members on the study tools, which indicates the effectiveness of the program based on teaching the pivotal response.

Abdul Hamid's study (2016) aimed to identify the effectiveness of a training program based on self-management skills in reducing self-harm and its effect on improving social behavior in children with autism spectrum disorder. The study was applied on a sample of 16 male autistic students enrolled in the autism program in Taif. Their ages were between 8-18 years old who had high harm and social behavior and they were divided into two groups, the first was experimental and consisted of 8 children and the second was control and consisted of 8 children. Control and the continuing effect of the program on the experimental group during the follow-up period.

Al-Khatib (2017) conducted a study that aimed to explore whether social impairment of autism spectrum disorders dominates the motor outcomes of a physical activity program. Nine children attended a two-week program that accredited the teaching of the pivotal response. Where the results indicated an improvement in the motor skills of all the participants. Moreover, children with social impairment showed greater improvement in mobility compared to children with less social problems. The results indicate the importance of social factors on the outcomes of physical activity programs and the separation between social and movement domains in treatment interventions with children with autism spectrum disorder.

Mukhtar, (2019) prepared a study that revealed that young adults with autism spectrum disorder often engage in aggressive behaviors. In this study, researchers examined outcomes for young adults with autism spectrum disorder who participated in a randomized clinical trial of multisystem therapy. Outcome measures for youth, parents, and at the household level were obtained at 6 and 12 months post-employment. The results indicated that the multi-system program was more effective than the usual community services in improving family performance and improving problem behaviors of youth. This study represents the first clinical trial of youth with chronic aggressive behaviors. The results indicate that such intense family therapies hold great promise with this clinical category. The implications of these findings for the continued development and evaluation of effective treatments for children with autism spectrum disorder are discussed.

2.6.1 Commenting on previous studies:

The study of the increases (2013) and Royle (2014) emphasized the importance of the pivotal response role in improving symbolic play and social skills.

The current study agrees with the study of Al-Khatib (2017) on the importance and role of the pivotal response in improving symbolic play skills and social skills, as well as the study of Mukhtar (2019) and the study of increases (2013) and Al-Ruwaili study (2014) on the importance of the pivotal response in developing social skills.

The current study differs from previous studies in its handling of aggressive behavior, number of program hours, place of study, number of sample members, and methods used.

3. Method and procedures

3.1 Study methodology

The current study is based on the semi-experimental approach which depends on selecting an intentional sample from the original community 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, 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 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 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 And who are classified as children with autism spectrum disorder, who do not suffer from associated disabilities, whether they are mental, visual, movement or any other disability, and who have not been subjected to any program in advance, and children with autism spectrum disorder who appear to have deficiencies in the skills of social interaction And they show some aggressive behaviors by referring to the personal files and records of children and applying the measures of social interaction skills and aggressive behavior and the scale of inclusion indicators. The experimental and control groups were also equivalent in terms of number, level of social interaction, aggressive behavior and inclusion indicators.

3.4 Study tools

To achieve the objectives of the study, which are to identify the effectiveness of a training program based on teaching the pivotal response in reducing aggressive behavior in children with autism spectrum disorder, the following tools were prepared:

1. Aggressive Behavior Scale

The aim of the scale: To detect the manifestations of aggressive behavior in children with autism spectrum disorder.

Dimensions of the scale: A list of common aggressive behaviors in children with autism spectrum disorder has been prepared in two dimensions: aggressive behavior towards the self, and aggressive behavior towards others.

Sources of building the scale: The meter was built from the following sources:

1. Previous research and studies in the areas of aggressive behavior.
2. The theoretical literature dealing with aggressive behavior.

The validity of the aggressive behavior scale : 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.

Consistency of the aggressive behavior scale: The stability of the aggressive behavior scale was verified by applying it to an exploratory sample of (12) children from the study population and outside its sample. , As the correlation coefficient that exceeds (0.6) guarantees the slope with respect to the stability of the used tool (Audi, 2010).

2. The training program

To design a training program based on the pivotal response in reducing aggressive behaviors among children with autism spectrum disorder in Irbid Governorate. The current study followed a set of steps to design the training program.

1. Determine the characteristics of children and the aggressive behaviors they have
2. Building the "proposed training program" in its initial form.
3. Presenting the "training program" to a group of arbitrators
4. Amendment of the "proposed training program"
5. Ensure the validity of the program 6. Ensure that the program is stable

3.5 Study variables

The independent variable: the training program based on response teaching.

Dependent variables: aggressive behavior 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.

Results

4.1 Answer study questions

The questions of the current study will be answered according to the statistical methods used in the study

Results related to the first question: "How effective is the training program based on response education in reducing the aggressive behavior of children with autism spectrum disorder in the post-test and delayed test".

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 aggressive behavior."

To answer this hypothesis, the arithmetic averages and standard deviations of the performance of the study sample individuals were extracted on the aggressive behavior scale for children with autism spectrum disorder in the experimental and control groups and to reveal the differences in the pre-test and post-test according to the group variable (experimental, control), as shown in the table (1):

Table (1) Arithmetic averages, standard deviations, adjusted averages, and standard errors of scores for members of the control and experimental groups in the pre-test and post-test on the aggressive behavior scale.

Dependent variable (aggressive behavior)	the group	Per-test		post-test		Adjusted arithmetic means	Standard errors errors
		Arithmetic mean	standard deviation	Arithmetic mean	standard deviation		
Aggressive self- behavior (score out of 48)	Control	33.67	2.97	30.20	6.17	30.20	1.22
	Experimental	33.40	2.85	16.53	2.56	16.53	1.22
Aggressive behavior towards others (score of 44)	Control	32.80	2.27	29.20	5.43	29.20	1.07
	Experimental	32.27	2.34	15.53	2.13	15.53	1.07
Overall Aggressive Behavior Scale (Score out of 92)	Control	66.33	4.67	59.40	11.34	59.40	2.24
	Experimental	65.67	4.72	32.07	4.64	32.07	2.24

Table (1) shows that there are differences between the average performance of members of the control and experimental groups in the pre-test and post-test on the aggressive behavior scale. 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) The results of the accompanying multiple analysis of variance (MANCOVA), for the performance of members of the control and experimental groups on the Aggressive Behavior 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)
Aggressive behavior towards the self in a pre-test	Aggressive behavior towards self in post-test	11.661	1	11.661	0.517	0.479	0.019
	Aggressive behavior						

	towards others in post-test	0.257	1	0.257	0.015	0.905	0.001
Aggressive behavior towards the self in a pre-test	Aggressive behavior towards self in post-test	2.223	1	2.223	0.099	0.756	0.004
	Aggressive behavior towards others in post-test	6.743	1	6.743	0.381	0.542	0.014
Hotelling =2.95 F=36.878 H=0000	Aggressive behavior towards self in post-test	1344.795	1	1344.795	59.632	0.000	0.696
	Aggressive behavior towards others in post-test	1345.766	1	1344.366	76.018	0.000	0.745
The error Adjusted total	Aggressive behavior towards self in post-test	586.342	26	22.552			
	Aggressive behavior towards others in post-test	460.147	26	17.698			
5	Aggressive behavior towards self in post-test	2024.967	29	.			
	Aggressive behavior towards others in post-test	1876.967	29				

Table (2) shows the existence of statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the arithmetic means on the dimension of the aggressive behavior towards the self in the post-test in favor of the experimental group, where the value of (f) was (59.632). Through the modified averages shown in Table (1). Where the dimension of the aggressive behavior towards the self in the dimensional measurement of the experimental group was (16.53) compared to (30.20) for the control group. This indicates a decrease in the aggressive behavior towards the self of the experimental group and this is due to the effect of the training program. It is clear from Table (12) that the value of the partial ETA square for aggressive behavior towards the self (0.696), which is the size of the training program effect, explains (69.6%) of the explained variance in the dimension of the aggressive behavior towards the self, and the rest (unexplained) is attributed to other variables.

Table (2) shows the existence of statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the arithmetic means on the dimension of aggressive behavior towards others in the post-test in favor of the experimental group, where the value of (P) was (76.018). Through the modified averages shown in Table (1). The dimension of the aggressive behavior towards others in the dimensional measurement of the experimental group was (15.53) compared to (29.20) for the control group. This indicates a decrease in the aggressive behavior towards others for members of the experimental group and this is due to the effect of the training program. It is evident from Table (5) that the value of the partial ita square for aggressive behavior towards others (0.745), which is the size of the effect of using the training program, explains (74.5%) of the explained variance in the dimension of aggressive behavior towards others, and the rest (unexplained) is attributed to other variables.

The accompanying one-size-fits-all analysis of variance (ANCOVA) was used for the differences between the scores of the sample individuals on the post-test aggressive behavior scale as a whole, according to the difference of the group variable, where the results were, as shown in Table (3).

Table (3) the results of the analysis of the accompanying analysis of variance (ANCOVA) for the differences between the averages of the control and experimental groups in the two pre-test and post-test on the post-test aggressive behavior scale by the different 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
Aggressive 0.041 Behavior scale in telemetry	Aggressive Behavior Scale in pry-test	86.033	1	86.033	1.152	0.293	
0.731	the group	5472.126	1	5472.126	73.269	0.000	
	Error	2016.501	27	74.685			
	Adjusted total	7705.867	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 aggressive behavior scale in the post-test in favor of the experimental group, where the value of (P) was (73.269). Through the modified averages shown in Table (1). The dimensional aggressive behavior scale for the experimental group was (32.07) versus (59.40) for the control group. This indicates a decrease in the aggressive behavior towards others among the members of the experimental group and this is due to the effect of the training program. It is clear from Table (3) that the value of the partial ita-square of the post-test aggressive behavior scale (0.731), which is the size of the effect of using the training program, explains (73.1%) of the explained variance in the dimensional aggressive behavior scale, and the rest (unexplained) is attributed to other variables.

Acceptance of the alternative hypothesis that includes "there are 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 of aggressive behavior."

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

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

Table (4): The arithmetic means, standard deviations, adjusted averages, and standard errors of the scores of the members of the experimental group for the pre-test and post-test on the scale of aggressive behavior.

Dependent variable (aggressive behavior)	the application	Arithmetic mean	standard deviation	Arithmetic mean	Standard errors errors
Aggressive self-behavior (score out of 48)	Pry-test	33.40	2.85	33.40	0.70
	post-test	16.53	2.56	16.53	0.70
Aggressive behavior towards others (score of 44)	Pry-test	32.27	2.34	32.27	0.58
	post-test	15.53	2.13	15.53	0.58
Overall Aggressive Behavior Scale (Score out of 92)	Pry-test	65.67	4.72	65.67	1.21
	post-test	32.07	4.64	32.07	1.21

Table (4) shows the existence of differences in the performance of the members of the experimental group in the preemptive and postural measures on the behavior scale. To demonstrate the significance of the statistical differences between the arithmetic means, the Multiple Analysis of Variation (MANOVA) test was used. Table (5) illustrates these results.

Table (5) Results of the Multiple Analysis of Variation (MANOVA), for the performance of the experimental group members in the pre-test and post-test on the Aggressive Behavior Scale for Children with Autism Spectrum Disorder

The source Impact size of the ETA box) contrast	Dimensions scale	Sum of squares	Degrees of freedom	Average of squares	F value level	Indication (Partial
The application 0.812	Aggressive behavior to wards others	2133.633	1	2133.633	290.950	0.000
Hotelling =15.029 0.837	Aggressive behavior to wards others	2100.033	1	2100.033	418.016	0.000
F=202.90 0.833	Scale of Aggressive behavior as a whole	8467.200	1	8467.200	387.220	0.000
The error	Aggressive behavior to wards others	205.33	28	7.333		
	Aggressive behavior to wards others	140.667	28	5.024		
	Scale of Aggressive behavior as a whole	673.057	28	24.038		
Overall rate	Aggressive behavior to wards others	2338.967	29			
	Aggressive behavior to wards others	2240.700	29			
	Scale of Aggressive behavior as a whole	9411.200				

Table (5) shows the existence of statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the arithmetic means on the dimension of the aggressive behavior towards the self-due to the application of the program, where the value of (P) was (290.950). Through the modified averages shown in Table (4). The dimension of the aggressive behavior towards the self for the post-test application was (16.53) compared to (33.40) for the post-test application. This indicates a decrease in the aggressive behavior in the post-test and these differences are attributed to the training program. It is clear from Table (5) that the value of the partial it a square for aggressive behavior towards the self (0.812), which is the size of the effect of using the training program, explains (81.2%) of the explained variance in the dimension of the aggressive behavior towards the self, and the rest (unexplained) is attributed to other variables.

Table (5) shows the existence of statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the arithmetic means on the aggressive behavior towards others due to the application, where the value of (P) was (418.016). Through the modified averages shown in Table (14). The dimension of the aggressive behavior towards others for the post-test application was (15.53) compared to (32.27) for the post-test application. This indicates a decrease in the aggressive behavior in the post-test and these differences are attributed to the training program. It is clear from Table (15) that the value of the partial ETA square for aggressive behavior towards others (0.837) is the size of the effect of using the training program. (83.7%) of the explained variance in the aggressive behavior towards others is explained, and the rest (unexplained) is attributable 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 aggressive behavior before and after the implementation of the training program.

Acceptance of the alternative hypothesis included, "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 aggressive behavior before and after the implementation of the program."

Third: The third null hypothesis "There is no statistically significant difference at the level of significance ($\alpha = 0.05$) between the average ranks of the experimental group members in the post-test and tracer measurements on the aggressive behavior scale."

To answer this hypothesis, the arithmetic averages and standard deviations of the performance of the members of the experimental group on the aggressive behavior scale were extracted and to reveal the differences in the post-test and follow-up application according to the application variable (post-test, consecutive), 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 Aggressive Behavior Scale

Dependent variable (aggressive behavior)	the application	Arithmetic mean	standard deviation	Arithmetic mean	Standard errors errors
Aggressive self- behavior (score out of 48)	Post-test	16.53	2.56	16.53.	0.62
	delayed -test	16.27	2.25	16.27	0.62
Aggressive behavior towards others (score of 44)	Post-test	15.53	2.13	15.53	0.58
	delayed -test	15.73	2.05	15.73	0.58
Overall Aggressive Behavior Scale (Score out of 92)	Post-test	32.07	4.64	32.07	1.14
	delayed -test	32.20	4.20	32.20	1.14

Table (6) shows that there are no differences in the performance of the experimental group members in the post-test and delayed-test on the aggressive behavior scale. 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) Results of the Multiple Analysis of Variation (MANOVA), for the performance of the experimental group members in the post-test and tracer measurements on the Aggressive Behavior 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)
The application	Aggressive behavior to wards others	0.333	1	0.333	0.092	0.764	0.003
Hotelling =15.029	Aggressive behavior to wards others	0.300	1	0.300	0.068	0.795	0.002
F=202.90	Scale of Aggressive behavior as a whole	0.133	1	0.133	0.935	0.935	0.000
	Aggressive behavior to wards others	162.667	28	5.810			
The error	Aggressive behavior to wards others	122.667	28	4.381			
	Scale of Aggressive behavior as a whole	547.333	28	19.548			
	Aggressive behavior to wards others	163.200	29				
Overall rate	Aggressive behavior to wards others	122.667	29				
	Scale of Aggressive behavior as a whole	547.467	29				

Table (7) shows that there are no statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the arithmetic means on the two dimensions of the aggressive behavior 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 of aggressive behavior."

5. Interpretation and discussion of findings, recommendations and contributions

5.1 Interpret and discuss results

5.2 Introduction

The current study examined the effectiveness of response education in reducing aggressive behavior in children with autism spectrum disorder. The results of the study resulted in the effectiveness of the program used in achieving the objectives of the study.

Discussion related to the first question: "How effective is the program based on teaching the pivotal response in reducing the aggressive behavior of children with autism spectrum disorder in the post-test and tracer measurements?"

The results indicated that there are differences between the average performance of the members of the control and experimental groups in the pre-test and post-test applications on the scale of aggressive behavior towards the self in the post-test in favor of the experimental group, and the results also indicated the presence of statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in the arithmetic means On dimensional aggressive behavior towards others in favor of the experimental group.

These results confirm the effectiveness of the training program based on teaching the pivotal response in reducing the aggressive behavior of children with autism spectrum disorder in the telemetry. This result is attributed to the fact that the training program included a set of integrated exercises and activities that are based on encouraging the desired behavior and concealing the unwanted behavior.

Where the pivotal response and through its basic foundations represented in motivation, self-control, self-initiative and reference to multiple responses to alleviate aggressive behaviors (self-harm, harming others) through the skills of group play with peers, and bring about positive changes in the targeted core behaviors, which leads to improvement Social behavior skills and play skills, increasing the child's effectiveness and his integration into the natural environment, and his interaction with his ordinary peers. These activities and exercises also increase the child's ability to monitor his behavior and identify the desired and unwanted behaviors, as well as help him to master the skill, keep it and generalize it. After receiving the skill from his regular peers, through teaching the pivotal response the child can change some undesirable behaviors and determine the target behavior, as learning self-control skills, which depend on the help of parents, peers and specialists, help the child in controlling and managing his emotions, feelings and desires, and this is related Closely related to enhancing the motivation of the child, which guides him to reach his goals and makes him in a state of comfort and balance, which was indicated by the study of Al-Khatib, 2017, as this began to be evident through the application of the program sessions related to teaching the pivotal response, which included a group of movement stories based on teaching motivation and initiative Autonomy, self-tuning, and response to multiple signals

Al-Ruwaili (2014) indicated that sports play reduced the aggressive behavior of children with autism spectrum disorder by converting their negative energies into positive energies. And dealing with him through dialogue without resorting to imposing what he sees through violence and thus increase their social interaction and their integration into society

The results of the study, Abdul Hamid (2016) indicated that there were no statistically significant differences at the significance level ($\alpha = 0.05$) between the mean scores of the experimental group members in the post-test and delayed-test of aggressive behavior after implementing the training program.

This result is consistent with the study of Mukhtar, 2019, which indicated that there were no statistically significant differences between the mean of the experimental group's ranks in the post-test and delayed-test .

These results are due to the fact that the training program based on teaching the pivotal response worked to reduce the aggressive behavior of children with autism spectrum disorder, and this appeared through the stability of the level of aggressive behavior at low levels in the successive stages of the children of the experimental group, and this is due to the integrated methods and skills that it included. Training program based on pivotal response.

5.3 Recommendations and contributions of the study

1. Recommendations for institutions concerned with children with autism spectrum disorder
 - Providing the necessary facilities to integrate children with a minor degree of this category into public sector schools, abolishing shelter centers and replacing them with day service centers for children with moderate and severe injuries.
 - The need to provide an integrated team to take care of this category, consisting of a special education specialist, a psychologist, a pediatrician, and a specialist in recreational and sports games, in addition to activating the role of the family.
 - Identifying and strengthening the strengths of each child, identifying weaknesses, and working to develop appropriate treatment solutions for them.
 - Identify the individual differences of children and develop appropriate programs for each child separately.
 - The need to pay attention to appropriate behavioral methods such as imitation, reinforcement and role playing, as well as focus on play activities that help in developing the life skills of the child.
2. Research and proposed studies
 - The effectiveness of an integrated program to develop motor skills and reduce behavioral disorders in children with autism spectrum disorder.
 - The effectiveness of a family training program based on the pivotal response in reducing stereotypical behaviors among children with autism spectrum disorder.

5.4 Contributions of the study

The current study, through the training program, contributes to integrating children with autism spectrum disorder with their ordinary peers in society and the surrounding environment, and to create appropriate and appropriate conditions for their subsequent integration in the classroom with their ordinary peers, as well as contribute to supporting and empowering educational institutions and centers for this category with a set of methods and strategies. And integrated plans that are commensurate with the capabilities and capabilities of children of this group, and the current study also contributes to strengthening the partnership between the families of these children and the specialists working with them, and providing full support to them, It also contributes to drawing the attention of the Faculties of Physical Education and Sports in Jordanian universities to motivating students to specialize in the fields of sports for people with special needs, and to include a number of special courses for this category. Autism, and one of the most important contributions is to educate community members about the need to accept the group of people with autism spectrum disorder and to provide the necessary and sufficient support to ensure that they obtain all their rights like the rest of society.

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