



The Effect of Communication Skills Training and Enrichment on Social Responsiveness and Social Communication Skills of Adolescents with Autism Spectrum Disorder and their Parents

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Abstract

Background: Autism spectrum disorder (ASD) threatens one's socialization ability, and a lack of social skills can cause dysfunctions and mental health problems for adolescents. This study aimed to investigate the effect of communication skills training and enrichment on social responsiveness and social communication skills of adolescents with autism spectrum disorder and their parents in Shiraz.

Methods: The study method was quasi-experimental with a pre-test and post-test design and a control group. The statistical population comprised adolescents with ASD at clinics in Shiraz, Iran, in 2019. The sample was selected from adolescents who had been diagnosed with ASD by the exceptional education organization of Fars province, and the participants were randomly allocated to two experimental and control groups (n=20 per group). The research instruments included the social skills improvement system rating scale and the social responsiveness scale with the Autism diagnostic interview. Data were analyzed by descriptive (mean and standard deviation) and inferential statistics (multivariable analysis of covariance).

Results: The results showed that the communication skills training and enrichment program did not significantly affect the parents' social responsiveness or the adolescents' social communication skills. However, a significant difference was found between the experimental and control groups in terms of parents' social communication skills (Pvalue=0.007).

Conclusions: Based on research results it can be hence concluded that communication skills training and enrichment can be used to improve social communication skills in parents of adolescents with an autism spectrum disorder.

Keywords: Autism, Social responsibility, Communication skills, Adolescents.

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Introduction

Having a child with developmental disorders, compared to a normal child, can affect the whole family due to the child's increased behavioral problems, stressors such as lack of adjustment to the demands of life, and lack of social acceptance.^{1,2} Autism spectrum disorder (ASD) is a diagnostic condition that can endanger one's overall socialization ability. The lack of social skills can cause dysfunctions for adolescents in this critical period. The prevalence of ASD increased in the last decade, and this trend may continue in the future.

Therefore, standards for evaluating the treatment for communication skills should be improved.^{3,4} ASD in children and adolescents also affects their parents. In most cases, these parents experience heavy psychological stress in their parenting role.⁵ Children's and parents' characteristics, as well as external situational variables and life stressors, are the possible causes for increased parental stress. Parental stress hurts children's emotional and behavioral development and incurs long-term effects on their health.⁶

Lack of communication skills is often a complex and debilitating problem in ASD treatment. Non-verbal symptoms, generalization, and body language were rarely examined in traditional methods which, instead, focused on repetition and therapeutic skills.⁷ As a result, these defects can cause daily challenges for people with ASD when starting and continuing social interactions because the absence of a theory of mind can create a selfish view of the world.⁸

All children and adolescents with ASD should, doubtless, have access to social skills; skills that establish effective relationships with others, success in social and communication progress, and protect adolescents and their parents from psychological problems, anxiety, and depression. Therefore, it is vital to pay attention to social skills. In recent studies, researchers have focused on the environment as a factor contributing to the rise in ASD.^{9,10} Numerous interventional studies have investigated the effectiveness of programs designed to reduce social skill disorders in adolescents with ASD.^{8,11}

One such social skill intervention is communication skills education and enrichment for adolescents with ASD to develop their relationships and alleviate social isolation. Based on parental reports, the developers of these programs have realized that the treatment group showed improvement immediately after the intervention in terms of social skills, hosting, and presence in society, and these achievements were maintained on long-term follow-up, 1 to 5 years after the intervention.^{3,12,13} A research group independent of the developers replicated the primary findings of the experimental study, and the majority of results support the effectiveness of the program. The primary study by Laugeson et al.³ based on parents' and adolescents' reports demonstrated considerable progress in the knowledge of inter-personal concepts and skills, as well as a reduction in the symptoms of ASD and depression.

The communication skills training and enrichment program is an evidence-based scientific communication skills therapy suitable for people with ASD. When teaching communication skills, this program engages parents and other family members, which helps parents better observe the therapy outcomes, while equally benefiting the parents who lack good communication skills. Parents can both learn the adolescents' training and help them with their weekly assignments. Research suggests that this program is superior to previous programs since it focuses on larger samples involving parents and provides peer-mediated therapy and skills training in natural settings. These studies have introduced the said program as an effective therapy for teaching social skills to adolescents with ASD.¹⁴ The communication skills training and enrichment program mostly focuses on the deficiencies in communication skills identified among adolescents with ASD, including body language, two-way conversation, holding small gatherings, good and fair behavior, and bullying. This program also promotes cooperation and participation through games and role-playing.^{15,16}

Accordingly, this study aimed to examine the outcomes of implementing said evidence-based intervention. This study helps researchers examine the program's external validity by using other reliable and valid observational tools that had previously not been used for this program.

Materials and Methods

The research method was quasi-experimental with a pre-test and post-test design and a control group. The statistical population comprised adolescents with ASD at clinics in Shiraz, Iran, in 2019. The sample was selected from

adolescents who had been diagnosed with ASD by the exceptional education organization of Fars province, and the participants were randomly allocated to two experimental and control groups (n=20 per group). The inclusion criteria were voluntary attendance in the study, having an autism disorder, no simultaneous psychological or pharmaceutical treatment, and living in Shiraz. The exclusion criteria were more than two absences from the treatment sessions and reluctance to continue the treatment process. In the pre-test stage in the experimental and control groups, the questionnaires were completed by adolescents with autism and their parents. The experimental group received fourteen sessions (90-minutes sessions per week) of communication skills training and enrichment while the control group did not receive any training. After the training sessions, the post-test was done in the experimental and control groups. Based on the specific conditions of the statistical population, the researcher adhered to ethical considerations by not publishing the participants' personal information and keeping the questionnaires anonymous. The intervention program and the sessions are presented in table 1. Data were analyzed by descriptive (mean and standard deviation) and inferential statistics (multivariable analysis of covariance).

Data collection instruments included the Social skills improvement system rating scale¹⁷ and the social responsiveness scale with the Autism diagnostic interview.¹⁸ Cronbach's alpha coefficient for social skills improvement system rating scales and the social responsiveness scale with the autism diagnostic interview was estimated to be 0.78 and 0.81, respectively.

Table 1. An overview of the communication skills training and enrichment program

Session	Weekly interactive lessons	Explaining the assignment
1	Teaching information exchange	How can adolescents use information when conversing with their peers to gain shared benefits? Adolescents practice business information with peers.
2	Conversational skill	Adolescents are trained on the key structure of a two-sided conversation with their peers. They practice telephone call with their peers.
3	Electronic communication	Adolescents are trained about the correct and appropriate use of voice mail, email, text messages, instant messaging, SMS, and the Internet to build friendships. They develop their communication by using electronic tools.
4	Suitable choice of friends	Adolescents are familiarized with the social hierarchy at school and begin to identify groups they may belong to. They specify extra-curricular activities based on their interests.
5	Suitable choice of humor	Adolescents perform extra-curricular activities in social groups in which they exchange information with the members. Adolescents learn the basic rules of proper use of humor and learn how to pay attention to the feedback to humor. They pay attention to the feedback to their humor to realize whether other people laugh at it or not.
6	Strategies to start conversations with friends	Adolescents learn the precise mechanism of joining group conversations with their peers. They enter group conversations with their peers.
7	Strategies to end conversations with friends	Adolescents learn how to evaluate and detect peer acceptance when entering and exiting a group conversation, and realize when they are not accepted by their peers. They practice entering and exiting group conversations.
8	Teaching how to be with others	Adolescents are trained about successful planning and implementation of plans with their friends. As hosts, they plan a get-together.
9	Proper exercise	Adolescents are taught the rules of correct exercising. While playing, they can experience proper exercise.
10	Controlling sarcasm and verbal abuse	Adolescents are taught how to respond to verbal abuse from their peers. They learn the difference between verbal attacks and embarrassing feedbacks and how to change their behavior in response to them.
11	Controlling physical fights and cursing	Adolescents learn strategies for controlling bullying by changing inappropriate behaviors. If necessary, they learn new strategies for making threats.
12	Reasoning and conflicts	Adolescents receive instructions about the elements necessary for resolving peer conflicts. They should be able to continue what they were doing with reasoning during peer conflicts.
13	Controlling baseless rumors	Adolescents receive specific instructions about minimizing the effects of rumors. They learn to talk about facts in the face of rumors.
14	End-of-program ceremony	The skills trained in the program are evaluated. At the end of the program, the adolescents are rewarded.

Results

Table 2 shows the mean and standard deviation (SD) of the studied variable in the experimental and control groups in the pre-test and post-test.

Before analyzing the data of the hypotheses, they were checked to ensure that they met the assumptions of the analysis of variance (ANCOVA). To this end, six assumptions of ANCOVA, namely linearity, multicollinearity, homogeneity of variances, homogeneity of covariances, homogeneity of regression line slopes, and normal distribution of data, were investigated. The pre-tests of parents' social responsiveness, parents' social communication skills, and adolescents' social communication skills were regarded as covariates, while their post-tests were regarded as dependent variables. Based on table 3, the relationship between the variables on pre-and post-test was significant (Pvalue=0.001).

The correlation coefficient (r) was 0.441 between parents' social responsiveness and their social communication skills; 0.502 between parents' social responsiveness and adolescents' social communication skills; and 0.430 between parents' social communication skills and adolescents' social communication skills. Since these correlation coefficients were less than 0.9, the assumption of the lack of multicollinearity among the covariates was held.

To examine the homogeneity of variances, Levene's test of equality of variances was performed. Table 4 lists the results of this test for dependent variables (parents' social responsiveness, parents' social communication skills, and adolescents' social communication skills) in the experimental and control groups. Based on table 4 and due to the non-significance of Levene's test, we could perform ANCOVA. This means that the experimental and control groups were homogeneous in terms of variances before the intervention (on pre-test).

Another assumption of ANCOVA is the homogeneity of covariances. To examine this assumption, Box's M test was run. The results of Box's M test show a non-significant assumption of homogeneity of covariances (Box's M=33.78; F=1.76; Pvalue=0.084). As a result, the assumption of different covariances was held. Another assumption of ANCOVA is the homogeneity of regression line slopes. ANCOVA was

performed to examine regression line slopes and the group×pre-test interaction. Based on the results, the F values for the group×pre-test effect of parents' social responsiveness, parents' social communication skills, and adolescents' social communication skills showed that the pre-and post-test regression line slopes were not significant in the two groups. Therefore, the regression line slopes of parents' social responsiveness, parent's social communication skills, and adolescents' social communication skills x group interaction were not significant, and the assumption of regression line slope homogeneity was confirmed.

The Kolmogorov-Smirnov test was performed to check the normality of data distribution. The results of this test for examining the normality of distribution of the scores of parents' social responsiveness, parents' social communication skills, and adolescents' social communication skills in the two groups are given in table 5. The null hypothesis for the normality of data distribution in the two groups was confirmed for parents' social responsiveness, parents' social communication skills, and adolescents' social communication skills.

To compare the experimental and control groups based on post-test scores, after controlling the effects of pre-test, a multivariate analysis of covariance (MANCOVA) was first run to determine the effectiveness of the program on parents' social responsiveness, parents' social communication skills, and adolescents' social communication skills, and then the hypothesis was tested. The results of MANCOVA are given in table 6. MANCOVA for the two groups revealed that the tests were not significant (Pvalue=0.062). When multivariate tests, e.g., Pillai's Trace, border on significance (as is the case here, at Pvalue=0.062), based on the difference in the power of multivariate and univariate tests, one or multiple variables in the ANCOVA may have been significant.

Table 7 presents the ANCOVA results for the post-test scores of dependent variables. The ANCOVA results for parents' social responsiveness (F=0.375, Pvalue=0.546) and adolescents' social communication skills (F=0.165, Pvalue=0.689) indicate that, in these dependent variables, the two groups did not significantly differ. The ANCOVA results for parents' social communication skills (F=5.103, Pvalue=0.034) indicate that, in this dependent variable, the two groups significantly differed.

Table 2. Mean and standard deviation (SD) of the dependent variable in experimental and control groups in the pre-test and post-test

Variables	Phase	Experimental group	Control group
		M±SD	M±SD
Parents' social responsiveness	Pre-test	179.26±12.77	158.46±16.30
	Post-test	173.60±12.35	154.66±16.52
Parents' social communication skills	Pre-test	98.66±7.27	97.46±9.10
	Post-test	107.53±6.39	99.20±8.16
Adolescents' social communication skills	Pre-test	53.06±9.33	55.26±6.52
	Post-test	57.80±9.03	56.46±6.40

Table 3. Results of the assumed linearity of the relationship between pre-tests and post-tests

Variables	SS	df	MS	F	Pvalue
Parents' social responsiveness	4031.61	1	4031.61	60.07	0.001
Parents' social communication skills	885.90	1	885.90	46.38	0.001
Adolescents' social communication skills	642.44	1	642.44	30.31	0.001

Table 4. Results of Levene's test of equality of variances to examine the homogeneity of variances

Variables	Value	df1	df2	Pvalue
Parents' social responsiveness	3.307	1	28	0.089
Parents' social communication skills	3.915	1	28	0.058
Adolescents' social communication skills	0.092	1	28	0.764

Table 5. Results of Kolmogorov-Smirnov test to check the normality of data distribution

Variables	Groups	Kolmogorov-Smirnov	Pvalue
Parents' social responsiveness	Experimental	0.184	0.109
	Control	0.172	0.138
Parents' social communication skills	Experimental	0.127	0.217
	Control	0.137	0.203
Adolescents' social communication skills	Experimental	0.177	0.115
	Control	0.205	0.089

Table 6. Results of multivariate analysis of covariance (MANCOVA) on post-test scores of research variables in experimental and control groups

Variables	Value	df	Error df	F	Pvalue	Partial η^2
Pillais trace	0.403	5	19	2.565	0.062	0.403
Wilks lambda	0.597	5	19	2.565	0.062	0.403
Hotelling's trace	0.675	5	19	2.565	0.062	0.403
Roy's largest root	0.675	5	19	2.565	0.062	0.403

Table 7. Results of ANCOVA for post-test scores of dependent variables

Variables	SS	df	MS	F	Pvalue	Partial η^2	Power
Parents' social responsiveness	25.163	1	25.163	0.375	0.546	0.016	1.00
Parents' social communication skills	97.465	1	97.465	5.103	0.034	0.182	1.00
Adolescents' social communication skills	10.104	1	10.104	0.165	0.689	0.007	1.00

Discussion

The present study aimed to investigate the effect of communication skills training and enrichment on social responsiveness and social communication skills of adolescents with autism spectrum disorder and their parents in Shiraz. The results indicated that the communication skills training and enrichment program did not significantly affect the parents' social responsiveness or the adolescents' social communication skills. However, a significant difference was found between the experimental and control groups in terms of parents' social communication skills.

Many researchers consider it crucial to develop educational and rehabilitation programs for children with ASD and their parents. They express that four components of familiarity with self-help, play, the child's mental and cognitive problems, and training communication skills should be prioritized in these programs.¹⁹ Hashemi Razini and Karampoor²⁰ found a significant difference between social skills and communication skills in children with ASD and reported that this method can be employed as an intervention to reduce these children's clinical symptoms.

The parents receiving communication skills training show remarkable progress in overall social communication skills, such as social understanding, social responsiveness, social awareness, social motivation, cooperation, and responsibility.²¹ Laugeson et al.²² reported that parents participating in Peris group therapy demonstrated improved social performance in terms of social responsiveness and social communication. By teaching effective communication to parents of children with

ASD, these children find the opportunity to enjoy their social interaction with their parents and gain more social experiences, and this promotes parents' social responsibility towards their children.²³

By using parent-child interactive training, parents gain a positive perception of their children's behavior and communications. Moreover, children have a positive outcome in terms of knowledge of social skills, behavioral and emotional problems, better peer relations, and playing with peers.²⁴ Meadan et al.²⁵ instructed social skills to participants with ASD throughout their lifetime. The participants developed positive communication skills and personal relations with their family, friends, and peers, and showed more cooperation in school projects and playing with their peers.

A limitation of the present study was difficulty in implementing the program and the parents' irregular attendance. The researchers also faced time limitations when implementing some components of the intervention. It is recommended that psychologists, psychiatrists, social workers, parents, caretakers of children and adolescents with ASD, and teachers who work with these children use this educational program to improve the target group's social skills and interaction with the external world, thereby helping the development of children and adolescents with ASD.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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