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Effectiveness of Sand Play Training on Social Skills, Multiple Problem Behaviors and Peer Relationship in Children with Autism Spectrum Disorder

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Abstract: Sand play training is one of the most common interventions to help address social deficits in individuals with autism spectrum disorder. This study aimed to examine the effectiveness of sand play training on social skills, multiple problem behaviors and peer relationship in children with autism spectrum disorder (ASD). In a semi-experimental pretest-posttest-follow-up with a control group design, 30 children were selected by convenience sampling method and assigned to experimental and control groups randomly. The Matson Evaluation of Social Skills with Youngsters (MESSY) and Gilliam Autism Rating Scale (GARS-2) were used to collect data. The experimental group underwent 8 sessions of sand play training, but the control group did not receive any training. Repeated measures analysis of variance in SPSS-24 software was used to analyze the data. The results indicated that intervention was effective on social skills, multiple problem behaviors and peer relationship in children with ASD ($p < 0.01$). Furthermore, Results revealed that intervention effects continued at 2-month follow-up ($p < 0.01$). According to our results, sand play training improved the social skills and peer relationship and decreased the multiple problem behaviors in children with ASD. Therefore, this treatment along with other therapeutic interventions can be used as an effective intervention method in the rehabilitation program for children with ASD.

Keywords: Sand play training, social skills, multiple problem behaviors, children with autism spectrum disorder

Introduction

Autism is a developmental disorder that is associated with deficits in visual-auditory concentration, irritability, persistent impairment in establishing social relationships and interactions, and stereotyped and repetitive behaviors (Mohammadyari et al., 2021). The prevalence of autism spectrum disorders has been reported as approximately 30 per 10,000 people (Yaghooti et al., 2019). This disorder usually occurs four times more often in boys than in girls (Bjørklund & Chartrand, 2016). In United States, in a study conducted on 1.300.000 five-year-old children over three years, its prevalence was announced as 6.26 per 10,000 (Christensen et al., 2018). Autism disorder is characterized by severe and pervasive damage in various fields of development, such as impairment in social skills, communication skills, or the existence of repetitive and stereotyped behavior, interests, and activities (Taati & Zarbakhsh Bahri, 2019). Social skills as behaviors that help a person interact effectively with others and avoid undesirable

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responses include social, verbal and non-verbal skills that allow a person to understand and predict the behavior of others and control and regulate their interactions (Gresham et al., 2006). Children with autism show a profound deficiency in social behavior (Ketelaars et al., 2017). These children generally fail to develop connections with other people, rarely interact with others, often do not express their emotions, actively avoid physical contact, and avoid eye contact (Kovac et al., 2016). Therefore, inappropriate social behaviors are a major factor in not succeeding in social life in people suffering from ASD, so finding a way that ASD people can adapt to society and show appropriate behavior in social situations is the responsibility of experts and requires a research (Zayer et al., 2020).

Various intervention programs have been designed and used with the aim of improving communication, cognitive, social and behavioral skills for disadvantaged children (Rumney & MacMahon, 2017). One of the effective treatment programs is play therapy (with sand play approach) which is proposed in the form of sand play therapy. Sand play therapy is an indirect, non-directive and non-verbal method in which children are allowed to vent and express their challenging behaviors in a calm, safe and stress-free environment without the direct intervention of a play therapist (Turner, 2013). Sand play therapy provides many opportunities to express a wide range of emotions using sand (digging, pouring and hiding) and symbolic objects (Shamsi pour et al., 2019).

In this way, since playing with sand is compatible with children's verbal and cognitive developmental capacities and is considered a pleasant experience for children, it can effectively provide the possibility of examining and diagnosing children's issues and problems, thus creating a safe and accepting communication framework for the use of sand and symbolic figures. It helps to project and recreate the child's issues (Roesler, 2019). Sand play therapy is a therapeutic approach that has been used for a wide range of children's problems, for example, the effectiveness of sand play therapy on reducing behavioral and cognitive symptoms of attention deficit hyperactivity disorder (Zeinali & Rezazadeh, 2020), increasing social skills and reducing negative emotions in children with Down syndrome (Rezaee & Rasouli, 2020), reducing the challenging behaviors and anxiety of children with autism disorder (Sharif Daramadi et al., 2019), increasing the cognitive development of educable mentally disabled children (Malekpour & Nesai moghadam, 2014) and reducing the psychological problems of children with autism (Wang et al., 2019), therefore, a review of the background of the research showed that the effectiveness of the intervention of sand play therapy on the problems of children with disabilities has been confirmed, and there is a research gap in the field of the effectiveness of the said intervention on the social skills of children with autism.

The communication, social interaction and behavioral problems of children with autism affect not only these people throughout their lives, but also affect their parents who have an effective and significant role in the child's development. Consequently, the growth and improvement of the social skills of children with autism is necessary (Weiss et al., 2013). Also, since the researches carried out in the field of sand play therapy in Iran and other countries have focused more on children with mental disorders

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such as post-traumatic stress disorder, mental disability, deafness, dyslexia and hyperactivity, and less on children with autism spectrum disorders and considering that there has been limited research in the field of social skills, the necessity of such research is high. Therefore, the aim of the present study was to determine the effectiveness of sand play therapy training on the social skills in ASD children.

Material and Methods

The current research was a pre-test-post-test semi-experimental study with a control group and a two-month follow-up phase. The statistical population was all children with autism in Baharestan city (Iran) in 2021. Among these children, 30 people were selected according to the include criteria and were randomly assigned to experimental and control groups. Inclusion criteria included: diagnosis of autism based on psychiatric opinion and diagnostic tests used including Gilliam's test (cutoff score 52) (Gilliam, 2006), age of subjects (9-12 years) and parental consent to participate in the intervention. The exclusion criteria included the absence of students in training sessions, non-cooperation in activities, and the completed questionnaire being distorted. In this research, while observing all the ethical principles, obtaining informed consent from the subjects to participate in the research, and also gaining their trust regarding the confidentiality of their information and freedom of action to leave the research at any stage of the implementation, the necessary explanations were provided and the questionnaires were completed by the participants. SPSS-24 software and analysis of variance test with repeated measures were used to analyze the data.

Tool

Gilliam's Autism Rating Scale: This 42-question scale was designed by Gilliam (2006) and is suitable for 3-22-year-olds and can be completed by parents and professionals at school or at home. Three subscales of stereotyped behaviors (questions 1-14), communication (questions 15-28) and social interaction (questions 29-42) were evaluated on a Likert scale from never (score zero) to often (score 3). The maximum score of each of the subscales is 42 and the minimum score is zero, and high scores indicate the severity of the disorder and low scores indicate its mildness. Gilliam (2006) reported a validity of 0.88 using confirmatory factor analysis and a total reliability of this tool using Cronbach's alpha of 0.84. Ahmadi et al. (2011) reported the validity of the confirmatory factor analysis method as 0.95 and the reliability of this scale was estimated at 0.98 using Cronbach's alpha coefficient. In the present study, the reliability of the entire questionnaire was obtained using Cronbach's alpha method of 0.86.

Social Skills Questionnaire - Parent Form: The social skills measurement scale was compiled by Matson et al. (1983) to measure the social skills of 4-18 year olds. It has 56 questions that measure the appropriate social skills, relationship with peers, antisocial behaviors, aggression and impulsive behaviors and superiority seeking subscales based on a five-point Likert scale with a score range of 1 (never) to 5 (always), so the range of scores is between 56 and 280 and higher scores indicate higher

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social skills and vice versa. Matson et al. (1983) obtained the reliability coefficient of the entire questionnaire using Cronbach's alpha method as 0.81 and the validity using confirmatory factor analysis method as 0.85. In Bahadori jahromi et al. (2017), the total reliability coefficient of this questionnaire was 0.89 using Cronbach's alpha method and its validity was 0.68 using factor analysis method. In the present study, reliability was obtained using Cronbach's alpha method of 0.74.

In this research, sand play therapy intervention method was used based on Boik and Goodwin (2000) sand play therapy intervention. The sand play sessions consisted of 8 one-hour sessions, which were conducted by the researcher once a week for two months. The brief description of the meetings was according to Table 1.

Table 1. Description of sand play therapy intervention sessions

Session	Aim	Content
1	Creating the world A: Introduction of Sand play to clients B: Building the world	Creating a safe, protected and free space, being in a position where the child feels comfortable. Creating an opportunity for the child to create whatever he wants and use anything and the object on the table to tell a story.
2	A: To experience and make up the world again B: To experience	Encouraging the child to experience the whole world; creating space for deep experience; Create the ability to change in your world; Reaching the fact that by making changes, the child can leave that world if he wants to.
3	travel around the world	Recording the child's feelings about the created world, recording verbal and non-verbal signs, encouraging the client to express his feelings.
4	Shaping the scenario in order to create space for the intervention	Creating a scenario to determine how the child interacts with the world, playing a role by creating the impression of another person in the world
5	Identifying the child's behaviors, beliefs and feelings	Recounting the child's feelings towards the objects and people in the world, specifying the child's thoughts and feelings towards the characters added to the world, helping the child to recognize his feelings.
6	Intervention	Teaching how to interact with the world and its characters, teaching problem solving skills, rebuilding negative thoughts, the ability to control emotions and feelings indirectly while interacting with the world and the characters added in the world being experienced.
7	The transition stages A: Making meaning - making B: Communicating the sand world of the child's real loss	Explanation about how to build the world, understand the connection between the world, play with the world, communicate with the child's memories and current issues.
8	Destroying the world A: Understanding the world B: Erasing the world	Creating awareness for the child regarding his real needs and concerns, encouraging the child to interact with the reality-based environment, awareness for the child regarding how to interact with others and real life.

Results

According to the results, in the experimental group, 7 people were 9 years old (46.7%), 3 people were 10 years old (20%), 4 people were 11 years old (26.7%), and 1 person was 12 years old (6.6%), and in

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the control group 8 people were 9 years old (53.4%), 2 people were 10 years old (13.3%), 3 people were 11 years old (20%), and 2 people were 12 years old (13.3%). To check the difference of two groups in terms of age, chi-square test was used, and due to the non-significance of the statistic obtained (p=0.326), it can be concluded that the two groups of control and experiment are the same in terms of age. Also, in the experimental group there were 8 boys (53.3%) and 7 girls (46.7%), and in the control group there were 10 boys (66.7%) and 5 girls (33.3%). Chi-square test was used to check the difference of the two groups in terms of gender, and due to the non-significance of the statistic obtained (p=0.457), it can be concluded that the two control and experimental groups are the same in terms of gender. Table 2 provided the descriptive findings of pre-test, post-test and follow-up of social skills scores in experimental and control groups.

Table 2. Descriptive findings of social skills scores in pre-test, post-test and follow-up of the experimental and control groups

Variable	Phase	Experimental		Control	
		Mean	SD	Mean	SD
Appropriate social skills	Pretest	26.4	5.47	25.80	5.40
	Posttest	29	5.67	25.73	5.55
	Follow up	28.73	5.64	25.93	5.74
Antisocial behaviors	Pretest	35.47	5.64	36.87	6.40
	Posttest	34.20	5.78	36.40	6.17
	Follow up	33.67	5.22	36.20	6.36
Aggression and impulsive behaviors	Pretest	35.47	5.73	37.20	5.07
	Posttest	32.87	7.03	37.20	5.58
	Follow up	32.80	6.94	37.60	5.89
Supremacy	Pretest	13.47	2.97	12.13	3.27
	Posttest	13.13	2.64	12	3.23
	Follow up	12.80	2.98	12.33	2.82
Peer relationship	Pretest	28.53	5.57	27	6.12
	Posttest	31.07	5.42	27.47	5.93
	Follow up	31.13	4.93	27.60	5.94

According to Table 2, the average of the components of appropriate social skills and peer relations in the post-test of the experimental group compared to the control group is higher than the pre-test, and the average of the components of anti-social behaviors, aggression and impulsive and superiority-seeking behaviors in the post-test of the experimental group compared to the control group was lower than the pre-test.

Before performing the inferential test, the assumption of normality of the data was examined with the Shapiro-Wilk test. This assumption implies that the observed difference between the distribution of scores of the sample group and the normal distribution in the population is equal to zero. The results of

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this test showed that all the variables follow the normal distribution in pre-test, post-test and follow-up. Also, in order to check the assumption of homogeneity of covariances or equality of covariances with the total covariance, Mauchly's sphericity test was used. If the result of this test is significant, the Greenhouse–Geisser correction test is used to analyze the variance of repeated measures. In this research, the results of Mauchly's sphericity test were not valid for all research variables (P<0.05); Therefore, Greenhouse–Geisser results of repeated measures analysis are reported. The results of repeated measures analysis of variance to compare two groups in social skills variables in the three stages of pre-test, post-test and follow-up are reported in Table 3.

Table 3. The results of repeated measures analysis of variance to investigate the difference between groups in social skills in the three stages of pre-test, post-test and follow-up

Variable	Source	SS	DF	MS	F	p	Eta
Appropriate social skills	Phases	31.26	1.21	25.77	7.57	0.007	0.21
	Phases * Group	30.42	1.21	25.07	7.36	0.007	0.20
	Group	336.40	1	336.40	3.78	0.041	0.09
Antisocial behaviors	Phases	142.46	1.52	93.74	38.88	0.001	0.58
	Phases * Group	91.62	1.52	60.28	25.01	0.001	0.47
	Group	392.71	1	392.71	4.01	0.040	0.12
Aggression and impulsive behaviors	Phases	67.82	1.72	39.42	32.61	0.001	0.53
	Phases * Group	77.95	1.72	45.31	37.49	0.001	0.57
	Group	426.84	1	426.84	4.38	0.035	0.13
Supremacy	Phases	178.02	1.28	138.72	54.31	0.001	0.66
	Phases * Group	174.86	1.28	136.26	53.34	0.001	0.65
	Group	152.10	1	152.10	8.81	0.006	0.23
Peer relationship	Phases	112.62	1.40	80.34	37.92	0.001	0.57
	Phases * Group	68.88	1.40	49.14	23.19	0.001	0.45
	Group	356.01	1	356.01	4.22	0.044	0.13

According to table 3, the difference between the scores of appropriate social skills components (P < 0.01), antisocial behaviors (P < 0.01), aggression and impulsive behaviors (P < 0.01), superiority (p < 0.01) and the relationship with peers (P < 0.01) is significant in three stages of the research. Also, the difference in the mean scores of all research variables in the two experimental and control groups was significant (P<0.05). The results show that nearly 9, 12, 13, 23, 13 percent of the individual differences in the variables of appropriate social skills, antisocial behaviors, aggression and impulsive behaviors, superiority, relationship with peers are related to the difference between the two groups and the effect of the relevant experimental variable. In addition, the interaction between research stages and group membership is also significant in all research variables (P<0.01); In other words, the difference between scores in all research variables in three stages of the research in two groups is significant, so it can be concluded that sand play therapy has been effective in improving the social skills of children with autism spectrum disorders. According to the results obtained in the table 3, the difference between the pre-test, post-test and follow-up stages is significant in all research variables; Therefore, the results of the pairwise comparisons of the averages of the three stages using the Bonferroni test are reported in Table 4.

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Table 4. Bonferroni's post hoc test results in the three stages of pre-test, post-test and follow-up

Variable	Comparison	Mean difference	Std. error	p
Appropriate social skills	Pretest - Posttest	2.63	0.25	0.001
	Pretest – Follow up	2.33	0.27	0.001
	Posttest – Follow up	0.30	0.15	0.20
Antisocial behaviors	Pretest - Posttest	2.83	0.42	0.001
	Pretest – Follow up	2.46	0.24	0.001
	Posttest – Follow up	0.36	0.35	0.91
Aggression and impulsive behaviors	Pretest - Posttest	2.36	0.25	0.001
	Pretest – Follow up	1.76	0.33	0.001
	Posttest – Follow up	0.36	0.24	0.068
Supremacy	Pretest - Posttest	2.96	0.38	0.001
	Pretest – Follow up	3	0.39	0.001
	Posttest – Follow up	0.03	0.16	0.95
Peer relationship	Pretest - Posttest	2.46	0.38	0.001
	Pretest – Follow up	2.26	0.33	0.001
	Posttest – Follow up	0.20	0.19	0.93

In Table 4, the results of the Bonferroni test for pairwise comparisons of the mean difference in the three stages show that the difference in the average effects of social skills (appropriate social skills, antisocial behaviors, aggression and impulsive behaviors, superiority and relationship with peers) between the pre-test, post-test and follow-up stages is significant (P<0.01), but the mean difference between post-test and follow-up is not significant (P<0.05), which means that the post-test results have maintained their stability in the follow-up phase.

Discussion

The aim of the present study was to determine the effectiveness of sand play therapy training on the social skills in ASD children. The results exhibited that sand play therapy has been effective in improving social skills (appropriate social skills, antisocial behaviors, aggression and impulsive behaviors, superiority and relationship with peers) and the results have maintained their stability in the follow-up phase. This finding was consistent with the research results of Rezaee and Rasouli (2020), Sharif Daramadi et al. (2019) and Wang et al. (2019). Actually, sand play therapy as a psychotherapeutic technique enables clients to use small models in a sand tray to create their inner world that is compatible with different aspects of their social reality. This method is a very valuable creative process because fear and tensions are imagined in it and realistic feelings and positive changes are formed (Roesler, 2019). The sand tray provides the basis for children's creativity, innovation and initiative, which creates a pleasant and desirable feeling, confidence and safety in them (Sahlberg & Doyle, 2019). Playing with sand allows these children to express their aggressive and hurt feelings to facilitate more appropriate and social behaviors and to find a way to vent their aggressive feelings and behaviors (Ghadampour et al., 2018). Correspondingly, playtime gives the child the opportunity to stimulate his inner growth in a constructive and positive way and the child releases the feelings that he has been pressured to reveal and becomes self-aware of the problem (Zeinali & Rezazadeh, 2020); Therefore, sand play therapy creates

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an opportunity to discharge children's inner energy, feelings, behaviors and mental accumulations and facilitates social behaviors and reduces avoidance behaviors in children (Wang et al., 2019).

Based on the findings of the present research, by providing sand play areas in home, school and urban playgrounds, a positive step can be taken to improve the social skills of autistic children, which in turn, lack of it, plays an effective role in increasing the severity of children's behavioral and emotional problems and putting more psychological pressure on their families and teachers. The limitations of the present study were the sample size, the purposeful sampling method, and the lack of control of some intervening variables such as the severity of the autism disorder. Therefore, it is suggested that future researches should be conducted with a larger sample size, available sampling method and control of intervening variables. It is suggested that the officials of the organization and exceptional education and welfare organization consider sand play therapy training courses for teachers, trainers and therapists of autism disorder. It is also suggested that clinical psychologists and therapists use this method to change the social behavior of autistic children.

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