

Investigating the Effects of Sensory Development Support Program Prepared for Mothers on Sensory and Social Development of Children with Autism

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ABSTRACT

Background: Autistic children are the children experiencing sensory problems most. So, the fact that the autistic children should be supported in respect to sensory aspects, and can explore and perceive their environment accurately, and can establish social interactions with other people nearby is of great importance.

Aim: This study was conducted in order to investigate the effects of the sensory development support programme prepared for mothers on sensory and social development of children with autism.

Methods: The study was carried out between the dates of February 2020 and June 2021 as pre-test, post-test and retention test with control groups test pattern in primary schools and Private Training and Rehabilitation Centres, which have autism classes for children diagnosed as autistic and which are situated in Batman Province. The study was completed with 26 mothers (11 test, 15 control) who have children with autism and aged 7-10. The data were collected using Personal Information Form, Sensory Assessment Form for Children with Autism and Autism Social Skill Profile-Turkish Form. Data were analysed using SPSS version 22.

Results: When the changes in average scores of sensory scores of autistic children in test group ($Test_{post-test-pre-test} = -21,81 < Control_{post-tests-pre-tests} = 1,27$) and social skill scores ($Test_{post-test-pre-test} = 5,09 > Control_{post-tests-pre-tests} = -4,40$) were considered, it was concluded that after the application of Sensory Development Support Program, the joint effects of the sensory assessment scores of the children taking part in test and control groups on social skill scores were found statistically significant ($p < 0.05$)

Conclusion: It was determined that the sensory development support program applied to mothers was found to be effective on sensory and social development of children with autism.

Keywords: Autism, Sense, Sensory development, Social development.

INTRODUCTION

Autism Spectrum Disorder is a disorder which emerges stemming from functional disorders in the chemical structure of brain, and shows a high performance in some certain but limited fields such as music and mathematics, but is characterized with retard and problems in language development, lack of starting and sustaining mutual social interactions, limited interest field and repetitive behaviours^{1,2,3,4,5}.

The most important problem that children with autism spectrum disorder experience comes with sensory problems⁶. This state also comes first at basic traits differing them from those with typical development and developmental retardation.

The reason for this is that the children with autism spectrum disorder are the children who experience problems with more than one sense at the same time^{7,8}.

It has been observed that the sensory disorders in children with autism spectrum disorder are hypersensitivity to taste and smell sensory stimuli, and insensitivity to vestibular and proprioceptive to sensory stimuli^{9,10}. It has also seen that the children with autism sensory disorder can sometimes show hypersensitivity to stimuli stemming from audio, visual, tactual and vestibular senses and also they may sometimes set an indifferent attitude to these stimuli^{11,12}. Although the reactions that children with autism sensory disorder to sensory stimuli change from child to child, it is generally seen that sensory-perceptual problems in these children show abnormalities ranging from 30% to 100%.¹³.

The sensations these children receive from the environment or the body can be transmitted to the brain differently, in other words, incorrectly, and sometimes there is no integration between the senses received. That is, the brain cannot organize the sensations that it receives. In this case, it becomes difficult to create an appropriate and necessary respond to the sensation that it receives, which makes it difficult to feedback. Therefore, differences are observed in the way the sensations that children with autism spectrum disorder receive from these senses in social environments¹⁴. In addition, the sensory processing differences and sensitivities of individuals with autism spectrum disorder may increase their difficulty in interacting with people and taking part in society¹⁵. In the light of this information, since the emotional support of children with autism spectrum disorder is of critical importance in terms of exploring their environment, correct perception and social interaction with other people around them, it is thought that support activities to be carried out in this direction will contribute positively to the developmental areas of the child; It is aimed in this study to determine whether the Sensory Development Support Program prepared for mothers has an effect on the sensory and social development of children aged 7-11 with autism spectrum disorder.

MATERIAL & METHODS

The type of the study is the experimental design with pre-

test, post-test and retention test control group in order to test the effect of the sensory development support program prepared for mothers on the sensory and social development of their children with autism.

The study was carried out in primary schools and private education and rehabilitation centers with autism classes where children diagnosed with autism were educated in Batman province between February 2020 and June 2021.

The sampling of the study was established after ethics committee confirmation was taken from İnönü University Ethics Committee. According to this, the sampling group consisted of 36 mothers in total 21 of whom were test group and 15 of whom were control group who accepted to participate in the study voluntarily and who met the criteria. The study was completed with 26 mothers 11 of whom was test group and 15 of whom was control group.

In the study, Personal Information Form, prepared by the researcher to reach personal information of the children and their families, Sensory Evaluation Form for Autistic Children and Autism Social Skills Profile-Turkish Form to establish social skill levels of autistic children were used as data collection tools.

Before the study data were collected, 7 experts were applied about the program written. The program was applied as 12 sessions in total in a way that each session should be 45 minutes.

The pre-tests and post-tests of the study were applied to mothers of test and control group between the dates of August-September-October 2020; and also the mothers taking part in test group were applied retention test two weeks after post-test was applied
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RESULTS

Table 1: Comparison of Control Variables of Mothers in Test and Control Group

	Test Group (n=11)		Control Group (n=15)		Similarity
	N	%	N	%	
Demographic Features					
Mother's Education Status					
Primary School	7	63.6	14	93.3	$\chi^2=4.832$ $p=0.184$
Secondary School	2	18.2	-	-	
High School	1	9.1	1	6.7	
University	1	9.1	-	-	
Mother's Age					
20-30	5	45.5	3	20.0	$\chi^2=2.412$ $p=0.299$
31-40	6	54.5	11	73.3	
41-50	-	-	1	6.7	
51 and over	-	-	-	-	
Mother's Job					
Unemployed	11	100	15	100	
Employed	-	-	-	-	
Father's Age					
20-30	2	18.2	-	-	$\chi^2=5.196$ $p=0.158$
31-40	7	63.6	11	73.3	
41-50	1	9.1	4	26.7	
51 and over	1	9.1	-	-	
Father's Job					
Unemployed	4	36.4	9	60.0	$\chi^2=1.418$ $p=0.234$
Employed	7	63.6	6	40.0	
Father's Education Status					
Illiterate	1	9.1	5	33.3	$\chi^2=6.198$ $p=0.185$
Primary School	6	54.5	2	13.3	
Secondary School	1	9.1	4	26.7	
High School	2	18.2	3	20.0	
University	1	9.1	1	6.7	
Number of Children in Family					
1	-	-	1	6.7	$\chi^2=4.306$ $p=0.506$
2	2	18.2	-	-	
3	4	36.4	4	26.7	
4	2	18.2	5	33.3	
5	2	18.2	3	20.0	
6 and more	1	9.0	2	13.3	

When the demographic features of the mothers in test and control group were studied, it was determined that 63.6% of mothers of test group were primary school graduates and 54.5% of them were between the age of 31 and 40, and all mothers in this group were unemployed. In addition, 54.5%

of husbands of mothers taking part in the test group were primary school graduates and between the ages of 31-40 and 63.6% of them did not have any jobs. While the maximum number of the children of the families taking part in the test group was established to be 36.4%, the lowest

number was 9.0%.

It was determined that 93.3% of the mothers taking part in control group were primary school graduates and they were between the ages of 31 and 40, and none of them worked. In addition, it was determined that 33.3% of the husbands of the mothers taking part in the control

group were illiterate, 73.3% of them were at the ages of 31 and 40, and 60.0% of them did not have any jobs. While it was determined that maximum number of children of control group families was 33.3%, the lowest number was 6.7%.

Table 2: Comparison of Control Variables of Autistic Children in Test and Control Group

	Test Group (n=11)		Control Group (n=15)		Similarity
	N	%	N	%	
Demographic Features					
Age of Children					
7 years old	1	9.1	5	33.4	$\chi^2=9.124$ $p=0.058$
8 years old	5	45.4	2	13.3	
9 years old	1	9.1	6	40.0	
10 years old	2	18.2	-	-	
11 years old	2	18.2	2	13.3	
Gender of Children					
Girl	3	27.3	1	6.7	$\chi^2=2.070$ $p=0.279$
Boy	8	72.7	14	93.3	
Number of Siblings					
Only Child	-	-	1	6.7	$\chi^2=1.574$ $p=0.664$
1-2 Siblings	3	27.3	2	13.3	
3-4 Siblings	6	54.5	8	53.3	
5 and more Siblings	2	18.2	4	26.7	
Birth Order of Child					
First Child	4	36.4	4	26.7	$\chi^2=1.544$ $p=0.462$
One of the Middle Children	4	36.4	9	60.0	
Last Child	3	27.2	2	13.3	
Age of Child Diagnosed					
1-3 years old	6	54.5	8	53.3	$\chi^2=2.849$ $p=0.416$
4 years old	5	45.5	4	26.7	
5 years old	-	-	1	6.7	
6 years old	-	-	2	13.3	
Type of School Child Attends					
Special Education Institution + Special Education Class	11	100	15	100	
Child's First Age of Education					
Between 1-3	1	9.0	2	13.3	$\chi^2=3.369$ $p=0.498$
4 years old	2	18.2	5	33.4	
5 years old	4	36.4	3	20.0	
6 years old	4	36.4	3	20.0	
7 years old and older	-	-	2	13.3	

When the demographic characteristics of the autistic children of the mothers in test and control groups were examined, it was determined that 45.4% of the children with autism of the mothers in the test group were 8 years old, 72.7% were male, 54.5% had 3-4 siblings, and 27.2% was the final child. In addition, it was determined that 54.5% of the autistic children of the mothers in test group were diagnosed between the ages of 1-3, and all of the children attended both a special education institutions and a special education classes, and 36.4% of them started education for the first time at the age of 5 and 6.

It was determined that 40.0% of the autistic children of mothers in the control group were 9 years old, and 93.3% were boys, and 53.3% had 3-4 siblings, and 60% were one of the middle children. In addition, it was determined that 53.3% of the autistic children of mothers in the control group were diagnosed between 1-3 years of age, and all of the children attended both a special education institutions and a special education classes, and 33.3% of them started education for the first time at the age of 4.

Table 3: Descriptive Statistics of Sensory Evaluation Scores

Test	Group	n	\bar{X}	Ss	Min.	Max.	Skewness	Kurtosis
Test Group	Pre-test	11	98.27	22.45	53	119	-0.99	-0.23
	Post-test	11	79.55	14.98	54	96	-0.79	-0.66
	Retention	11	76.46	14.04	53	91	-0.76	-0.79
Control Group	Pre-test	15	95.33	23.84	56	126	-0.17	-1.20
	Post-test	15	96.60	23.00	62	126	-0.19	-1.28

Table 4: Two-factor ANOVA analysis results for mixed patterns of sensory evaluation pre-test and post-test scores of Experimental and Control groups.

Variance Source	KT	KO	sd	F	p
Inter-groups					
Group (Test -Control)	632.20	632.20	1	0.76	0.39
Error	19910.29	829.60	24		
Intra-Groups					
Measurement (Pre-test-Post-test)	967.39	967.39	1	8.47	0.01*
Group*Measurement	1268.46	1268.46	1	11.10	0.00*
Error	2741.56	114.23	24		

p < 0.05

In Table 4, considering the group*measurement joint effect to determine the effectiveness of the applied experimental procedure, it was concluded that the common effects of repeated measurement (pre-test-post-test) factors on the sensory evaluation scores of the participants were statistically significant, although there were (Test-Control Groups) in different treatment groups. ($F_{\text{group*measurement}(1-24)}=11.10$; $p=0.00$; $p<0.05$). This finding showed that the test procedure was effective, and that the application of the sensory development support program prepared for mothers and not applying any activities had different effects

on increasing the sensory evaluation scores of the children. Considering the change in the mean scores of the sensory evaluation scores (Test post-tests-pre-tests=-21.81 < Control post-tests-pre-tests =1.27), it was determined that the decrease in the sensory evaluation scores of the test group children was higher than the scores of the children in the control group. In other words, it can be said that this finding has a positive effect on the sensory evaluation scores of children in the sensory development support program prepared for mothers.



Figure 1: Graph of the mean scores of the sensory evaluation pre-test, post-test and retention scores of the children in the test and control groups.

Table 5: Descriptive statistics of social skill scores

Test Group	Group	n	\bar{x}	Ss	Min.	Max.	Skewness	Kurtosis
Test Group	Pre-test	11	85.55	12.73	71	109	1.11	0.20
	Post-test	11	90.64	17.33	63	119	0.32	-0.71
	Retention	11	92.10	17.78	65	121	0.45	-0.72
Control Group	Pre-test	15	87.40	16.93	67	129	1.19	1.26
	Post-test	15	83.00	16.96	53	120	0.46	0.82

Table 6: Two-factor ANOVA analysis results for mixed patterns of social skills pre-test and post-test scores of the Test and Control groups.

Variance Source	KT	KO	sd	F	p
Inter-groups					
Group (Test -Control)	106.10	106.10	1	0.23	0.64
Error	11320.62	471.69	24		
Intra-group					
Measurement (Pre-test-post-test)	1.52	1.52	1	0.03	0.87
Group*Measurement	285.82	285.82	1	5.10	0.03*
Error	1344.26	56.01	24		

p < 0.05

In Table 6, considering the group*measurement joint effect to determine the effectiveness of the test procedure, It was concluded that although in different treatment groups (Experiment-Control), the common effects of repeated measurement (pre-test-post-test) factors on the social skill scores of the participants, were statistically significant. ($F_{\text{group*measurement}(1-24)}=5.10$; $p=0.03$; $p<0.05$). This finding demonstrated that the test procedure applied was effective, and that applying the sensory development support program prepared for mothers and not applying any

activities had different effects on increasing children's social skill scores. Considering the change in the average scores of social skill scores (Testpost-test-pretest=5.09 > Controlpost-test-pre-test=-4.40), it was determined that the increase in the social skill scores of the children in the experimental group was higher than the scores of the children in the control group. In other words, it can be said that the sensory development support program prepared for mothers has a positive effect on children's social skill scores.

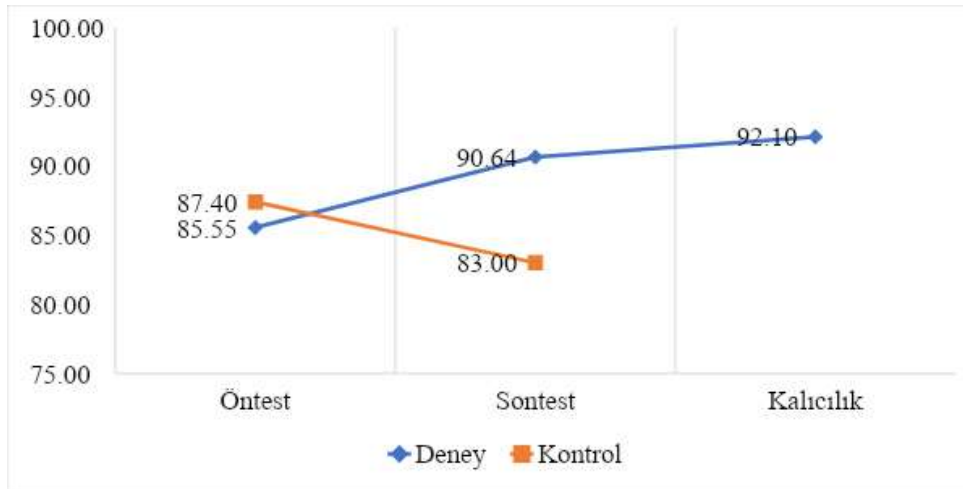


Figure 2: Average graph social skill pre-test, post-test and retention scores of children taking part in test and control group

DISCUSSION

It has been determined that the sensory development support program prepared for mothers has a positive effect on the sensory and social development of children.

In order that the Sensory Development Support Program is to be effective on the sensory and social development of children with autism, it is considered that the knowledge of their children should be enriched with the mothers' children sensory sensitivities they experience and that they should be informed about how they can overcome these sensitivities and that the activities should be made ready for sensory needs and that mothers see as problems with the program and that it should be effective and that they should show how they can teach these activities to their children at home.

Again, it is thought that the activities in the program are effective in increasing the interaction between the mother and the child, and that the children should be supported in order to adapt to different social environments by trying to develop children's tolerance to differences by including activities with materials with different social skills such as smells, tastes, visual and auditory stimuli, tactile features, etc. in the program, and that the social skill scores of children are effective on the increase in the total scores of the children in the test group.

As a result of going through the literature, no such study investigating the effect of sensory development support program prepared for mothers on the sensory development of children has been encountered. However, in one of the studies where the effect of the education

given to the parents reduce abnormal behaviors seen in the autistic children was evaluated, the abnormal behaviors in the children were reported to decrease according to opinions of parents¹⁶.

In Jordan, in a study where providing an education program prepared for autism spectrum disorder was investigated whether it increased the positive behaviors of children of mothers and whether improved their coping skills, and whether reduced their stress levels, it was found that there was a significant decrease in mothers' stress levels with the training provided. It was determined that with the education given, there was a significant decrease in mothers' stress levels and an increase in their coping abilities, and an improvement in mother-child interaction.¹⁷ According to another study carried out, it was determined that the education given to the parents of the children with autism was effective in generalizing in autistic children and maintaining their skills¹⁸.

In another study conducted by Fazlıoğlu in 2004, the effect of the sensory integration program prepared for autistic children on sensory and behavioral problems of these children was investigated and at the end of the study, it was found that this program had positive effect on both sensory and behavioral problems of these children.²

In another research performed on 8 children who were diagnosed as autistic, it was investigated whether the sensory education given them developed these children's acquiring language skills. According to the result of the research, it was determined that while 5 of 8 children who were given sensory education had increases in their

language scores and visual, audio and tactile perceptions, in 3 children participating in the study, while language scores increased, a limited increase was observed in the increase of their visual, audio and tactile perceptions.¹⁹

In the literature, no study investigating the effect of sensory development support program prepared for mothers on social development of children with autism has been encountered. However, in a study in which the effect of social story writing and application education given to families with autistic children on the autistic children's learning social skills, it was determined that the education given to the families was effective in the autistic children's learning targeted skills²⁰. In another research which was conducted with 3 autistic children and their mothers, the effect of intervention program based on transaction applied to children on social interaction of autistic children and interaction between mother and child was investigated. According to the result of the study, it was determined that the intervention program applied to the children was effective on the development of social interaction skills in the children, and that improvements were observed in children's social, emotional, mental and communicative skills, and also there were improvements in interaction of mother and child^{21, 22}.

CONCLUSION

When the findings obtained from the pre-test, post-test and retention test results about the effect on the sensory and social development of the children with autism of Sensory Development Support Program prepared for mothers were examined after the sensory development support program was applied, it was determined that the sensory evaluation and social skill scores of children taking part in test group demonstrated a significant difference ($p < 0,05$) compared to the children taking part in the control group; in other words, the sensory development support program prepared for mothers had positive effect on sensory and social development of children.

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