



## EFFECTIVENESS OF EXPOSURE THERAPY ON ANXIETY AND SENSORY OVER-RESPONSIVITY AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

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### ABSTRACT

To evaluate the effectiveness of Exposure Therapy (in vivo) on anxiety and sensory over responsivity among children with Autism Spectrum Disorder. This study is to assess the effectiveness of Exposure Therapy (in vivo) on anxiety and sensory over responsivity among children with Autism Spectrum Disorder. A Quasi quantitative experimental design, conducted at various settings such as Pebbles-Centre for child development, Commissionerate for the welfare of differently abled and finally in Pediatric unit, SRM University, Ramapuram with 26 Autism Spectrum Disorder Children of the age group 3- 10 years assessed using Sensory Profile and Hamilton Anxiety Rating Scale. The outcome of the study shows significant improvement in reducing sensory over responsivity and anxiety among children with Autism Spectrum Disorder. The results were obtained through an observation, parental interview, assessment tools and Wilcoxon signed rank test through SPSS trial version 20.0 with alpha level set at 0.05 was used for statistical anal in sample population. The result of this study suggest that exposing children to their feared sensory stimulus reduces their sensory over-responsivity and anxiety regarding that stimulus. Exposure therapy (in vivo) helped the children to reduce sensory over responsivity and anxiety related to it. Exposure therapy (in vivo) will be effective in reducing sensory over responsivity and anxiety related to it among children with Autism Spectrum Disorder.

**KEY WORDS:** Exposure therapy (in vivo), Sensory over Responsivity, Anxiety, Autism Spectrum Disorder.



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Received on : 02-12-2016

Revised and Accepted on : 17-03-2017

DOI: <http://dx.doi.org/10.22376/ijpbs.2017.8.2.b436-439>

## INTRODUCTION

Autism spectrum disorder (ASD) are lifelong complex set of neurodevelopmental disorders ranging from mild to severe pervasive impairments in social interaction, cognition and communication along with restricted, repetitive and stereotyped patterns of behaviors, interests and activities.<sup>1</sup> "Prevalence of Autism Spectrum Disorders in a Total Population Sample". the prevalence of ASDs was estimated to be 2.64%, with 1.89% in the general-population sample and 0.75% in the high-probability group.<sup>2</sup> Anxiety disorders are elevated in the ASD population and often co-occur with SOR.<sup>3</sup> Anxiety is characterized by pervasive, long standing, feelings of uneasiness, fearfulness, or dread that are not founded on realistic concerns. Sensory over-responsivity or sensory defensiveness is called as sensory modulation disorder. Sensory modulation problem include over reactions to touch, movement, sounds, odors, tastes any of which may create discomforts, avoidance, distractibility and anxiety. Sensory over-responsivity (SOR) is another common, and impairing feature found in more than half of children with ASD, and SOR has been linked to anxiety in children with ASD.<sup>4</sup> Exposure therapy is a technique in behavior therapy used to treat anxiety disorders. It involves the exposure of the patient to the feared object or context without any danger, in order to overcome their anxiety. There are many types in exposure therapy namely imaginal, interoceptive, virtual reality and situational or in vivo. In exposure therapy, clients relive memories of the traumatic event and confront situations that are avoided because they trigger distressing memories and thoughts. Several controlled studies have found exposure therapy effective in reducing symptoms of PTSD in combat veterans and survivors of childhood sexual abuse or other traumas.<sup>5-7</sup> Based on the above studies, this research is to focus on the effectiveness of Exposure Therapy (in vivo) on anxiety and sensory over responsivity among children with Autism Spectrum Disorder.

## METHODOLOGY

This study adopted quantitative approach and quasi experimental design and the samples were selected based on non- probability convenient sampling. The samples were randomly assigned to experimental and

control group. Totally 30 samples were recruited 15 in experimental group and 15 in control group based on inclusion criteria (children with Autism Spectrum Disorder based on DSM – V criteria, Autistic children with Sensory Over Responsivity, Autistic children with anxiety and Autistic children with age group of 3- 10 years) and exclusion criteria (children with cardiac conditions and children with other physical impairments) during the therapy session four discontinued due to unavoidable circumstances and finally the research was proceeded with the sample size of 26. The tools used for this study were Hamilton anxiety rating scale and sensory profile. The samples for this research were recruited from Pebbles- centre for child development, Commisionerate for the welfare of differently abled and Paediatric clinic, SRM University, Ramapuram, Chennai.

## PROCEDURE

The purpose of the study was explained to the authorities of the therapy clinic involved and institution consent letter was obtained. Written parent consent form was obtained from the parents of experimental group as their children underwent exposure therapy. The duration for exposure therapy protocol were 5 sessions per week including two homework sessions over a period of 3- 4 weeks. Initially in the first session orientation to the therapy sessions were given and information regarding the children was collected based on Sensory profile and Hamilton Anxiety Rating Scale. In the next session the common reactions of the children are listed out and hierarchy was identified. In the following 7- 10 sessions exposure therapy (in vivo) was conducted according to the inference acquired from the first 2 sessions. The children must be exposed to the situation for 30- 45 minutes. The homework was reviewed at the beginning of each session. The results were analyzed using Wilcoxon signed rank test through SPSS trial version 20.0 with alpha level set at 0.05.

## RESULTS

This chapter deals with the statistical analyses of the data and the results obtained from the analysis of different variables of the research. The table reveal the comparison between "pre-test" and "post-test" in experimental and control group.

**Table 1**  
**Comparison of pre-test and post-test Scores of control group N=26**

	Pre Test( n =13 )		Post Test ( n = 13 )		Statistic	p value
	Mea n	Std. Deviation	Mea n	Std. Deviation		
AUDITORY POCESING	30.2	3.7	30.6	3.5	-1.89	.059
VISUAL PROCESSING	37.7	4.6	38.2	4.3	-2.121	.034*
VESTIBULAR PROCESSING	41.6	6.6	41.7	6.5	-1	.317
TOUCH PROCESSING	72.7	8.6	73.1	8.0	-1.89	.059
MULTISENSORY PROCESSING	21.8	5.5	22.5	5.3	-2.271	.023*
ORAL SENSORY PROCESSING	38.3	11.8	38.8	11.7	-2.121	.034*
SENSORY PROCESSING RELATED TO ENDURANCE/ TONE	31.2	7.1	32.6	6.9	-2.041	.041*
MODULATION RELATED TO BODY POSITION AND MOVEMENT	38.8	8.1	39.3	7.7	-1.857	.063
MODULATION OF MOVEMENT AFFECTING ACTIVITY LEVEL	21.2	8.0	21.8	7.6	-2.251	.024*
MODULATION OF SENSORY INPUT AFFECTING EMOTIONAL RESPONSES	14.2	4.2	14.7	3.7	-1.604	.109
MODULATION OF VISUAL INPUT AFFECTING EMOTIONAL RESPONSE AND ACTIVITY LEVEL	15.7	3.3	15.8	3.2	-1.414	.157
EMOTIONAL/ SOCIAL RESPONSES	55.4	8.5	55.9	8.1	-2.07	.038*

BEHAVIOURAL OUTCOMES OF SENSORY PROCESSING	17.9	5.3	18.2	5.2	-2	.05
ITEMS INDICATING THRESHOLDS FOR RESPONSE	11.3	1.9	11.5	1.7	-1.414	.157
Hamilton Anxiety Rating Scale	14.2	4.7	14.8	4.5	-0.365	.715

*\*Statistically significant at 5% level*

Table 1 reveals the scores of sensory profile components and Hamilton anxiety rating scale for the control group. The total n value is 26 and p value is less than 0.05 for certain components such as visual processing, multisensory processing, oral sensory

processing, sensory processing related to endurance/ tone, modulation of movement affecting activity level and emotional/ social responses because of the conventional therapy intervention.

**Table 2**  
**Comparison of pre-test and post-test scores of experimental group N=26**

	Pre Test( n =13 )		Post Test ( n = 13 )		Statistic	p value
	Mean	Std. Deviation	Mean	Std. Deviation		
AUDITORY POCESSING	23.23	5.69	27.08	4.94	-3.071	.002*
VISUAL PROCESSING	33.15	5.24	37.23	2.13	-2.966	.003*
VESTIBULAR PROCESSING	43.15	6.01	45.00	4.73	-2.536	.011*
TOUCH PROCESSING	61.54	12.89	66.77	10.51	-2.943	.003*
MULTISENSORY PROCESSING	19.77	4.19	21.92	3.64	-3.134	.002*
ORAL SENSORY PROCESSING	41.23	9.47	45.00	5.87	-2.823	.005*
SENSORY PROCESSING RELATED TO ENDURANCE/ TONE	33.38	6.19	35.77	3.88	-2.207	.027*
MODULATION RELATED TO BODY POSITION AND MOVEMENT	33.92	6.97	37.00	6.27	-2.818	.005*
MODULATION OF MOVEMENT AFFECTING ACTIVITY LEVEL	21.62	5.84	23.54	4.20	-2.536	.011*
MODULATION OF SENSORY INPUT AFFECTING EMOTIONAL RESPONSES	9.77	1.74	11.31	1.84	-2.687	.007*
MODULATION OF VISUAL INPUT AFFECTING EMOTIONAL RESPONSE AND ACTIVITY LEVEL	13.15	2.76	14.23	2.65	-2.889	.004*
EMOTIONAL/ SOCIAL RESPONSES	54.54	4.12	58.31	3.57	-2.952	.003*
BEHAVIOURAL OUTCOMES OF SENSORY PROCESSING	17.15	5.30	19.00	4.14	-2.825	.005*
ITEMS INDICATING THRESHOLDS FOR RESPONSE	9.15	2.44	10.38	3.57	-2.06	.039*
Hamilton Anxiety Rating Scale	16.54	7.02	14.69	5.89	-2.614	.009*

*\*Statistically Significant at 5% level*

Table 2 reveals the scores of sensory profile components and Hamilton anxiety rating scale for the experimental group. The total n value is 26 and p value is less than 0.05 for all the components because of exposure therapy intervention. The difference is visible between pre-test and post-test scores. Hence, the exposure therapy intervention is effective.

## DISCUSSION

Exposure therapy (in vivo) intervention is to investigate whether direct and gradual exposure of the patient to the feared object or context without any danger can lead to subsequent reduction in their anxiety levels. The study was undertaken on children with Autism Spectrum Disorder, the age group of 3-10 years. Totally twenty six children were taken from various clinical settings. Sensory profile and Hamilton anxiety rating scale questionnaire was given as pre-test and post-test assessment. During the therapy session in the experimental group the children exhibited latency period to initiate the task immediately after command. The ability to make them understand, initiate and do the actions was a slight draw back. The actions were elicited after imitation, demonstration, verbal prompts and reinforcements by the researcher. After a success the successive exposures and repetitions were initiated by the children on their own. After a month of Exposure therapy intervention, statistical analysis was done. Table 1 reveals the pre-test and post-test scores of the control

group. Only some components of the sensory profile are significant with p value less than 0.05 as the children were receiving their conventional therapy during our data collection period as there are no restrictions in this study to stop their conventional therapy. Table 2 reveals the pre-test and post-test scores of experimental group. The mean values of post-test are greater than the pre-test values which prove 'p' value is statistically significant. In a previous study titled "A comparison of exposure therapy, stress inoculation training and their combination for reducing post- traumatic stress disorder in Female Assault Victims". The result of the study support the hypothesis that prolonged exposure, stress inoculation training were superior to waiting list in post-traumatic stress disorder severity. A large number of participants in active treatment lost their PTSD diagnosis and reached clinically improved end- state functioning compared with waiting list participants.<sup>8</sup> Which proved exposure therapy is effective. In control group only some components of sensory profile are significant with p value less than 0.05. The children in the control group were receiving their usual occupational therapy during the data collection period as there are no restrictions in this study to stop their conventional occupational therapy. This resulted in significance of some components of sensory profile in the control group. Hence exposure therapy (in vivo) was proved to be effective in reducing sensory over-responsivity and anxious behavior due to sensory over-responsivity.

## CONCLUSION

This study demonstrated not only an effective intervention in reducing sensory over-responsivity but also reduces anxiety due to sensory over-responsivity. This study proved that exposure therapy (in vivo) was effective in reducing anxious behavior due to sensory-over responsiveness among children with Autism Spectrum Disorder while directly and gradually exposing them to their feared situation without any danger.

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## ACKNOWLEDGEMENT

First and foremost, I thank GOD ALMIGHTY for the immense blessing bestowed on me and for giving me the opportunity and strength to pursue this study. My deepest tribute and most sincere appreciation to my parents and family, whose prayers, blessings and vision have enabled me to complete my study.

## CONFLICT OF INTEREST

Conflict of interest declared none.

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We sincerely thank the above reviewers for peer reviewing the manuscript