



## A STUDY ON THE EFFICACY OF BEHAVIOR THERAPEUTIC INTERVENTION PROGRAMS FOR CHILDREN WITH AUTISM

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**ABSTRACT** Deficiency in social communication skills is one of the main features of Autism Spectrum Disorder (ASD) in children. Majority of children with autism struggle with social skills and communicative behaviors, which are the essential factors for social interactions. In order to improve the social skills for children with ASD, many researches have focused on developing effective interventions to treat these social communication deficits. The purpose of this paper is to investigate the efficacy of behavior therapy for children with autism to improve social skills. The study participants comprising of children with ASD were subjected to 'Behavioral Intervention' and interpreted using Statistical Package for Social Science (SPSS). Their response towards the intervention was analyzed and estimated using 'Whole Interval Recording'. From the implication of the test findings, the therapeutic efficacy of the behavioral interventions for children with ASD could serve as an effective approach in improving their social communication skills

**KEYWORDS :** Autism Specific Disorder (ASD), Social Communication skills, Behavior Therapy, Whole Interval Recording.

### 1. INTRODUCTION

The earliest descriptions of autism spectrum disorder (ASD) included impairments in social and communication skills [1, 2] and deficits in these skills remain central to the diagnostic definition of the disorder. With the advent of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, social and communication impairments were combined into one domain in recognition that socialization is inherently linked to the development of communication skills.

According to the diagnostic criteria, social communication difficulties become apparent in early childhood and consist of deficits in social-emotional reciprocity, non-verbal communicative behaviors used for social interaction, and developing, maintaining, and understanding relationships [3]. Social communication impairments can encompass a variety of skills. Deficits in social-emotional reciprocity may include abnormal social approach and failure of normal back-and-forth conversation; reduced sharing of interests, emotions, or affect; either failure to initiate or respond to social interactions [3]. Deficits in nonverbal communicative behaviors used for social interaction can include poorly integrated verbal and nonverbal communication, lack of eye contact and body language, insufficiencies in understanding and use of gestures, and a total lack of displaying facial expressions and nonverbal communication [3]. Deficits in social relationships can range from difficulties in adjusting behavior to suit various social contexts, to difficulties in sharing imaginative play or in making friends, to absence of interest in peers [3].

Intervening early to treat these impairments is vital. Social communication skills are often cited as top treatment concerns for children with ASD [4, 5]. Successfully treating these impairments may lead to better short and long-term outcomes as well as contribute to an overall improved quality of life. Fortunately, many interventional therapies were subjected for children with ASD and were studied quite intensively, as the prevalence of ASD has increased substantially in recent years. Researchers are trying to find an effective interventional therapy for individuals with ASD [6].

### 2. REVIEW OF LITERATURE

Autism or Autism Specific Disorder (ASD) is a neurodevelopmental condition contributed by some genetic and environmental factors. This condition can be observed in certain individuals, during their early childhood. Autism can be characterized by the individual's limited ability to interact socially as they express certain limitations in their verbal/nonverbal communication and are quite sensitive to certain changes and indulge in repetitive and stereotyped behavioural activities [7].

One of the root causes of the problem with autistic children is social communication. However some autistic children tend to develop normal behavioral activity, but in most of the cases the children are unable to speak and communicate. There are several developmental delays identified in individuals with autism syndrome and it has no definite cure [8].

Poor communication serves as one of the primary factors for behavior

related problems which may lead to commencement of negligence towards desirable activities and social attention. For gaining social attention the individuals must be subjected to objects/activities which could aid as communicative function [9].

The investigations involving autistic children has shown that, it is quite difficult to initiate behaviors which are concerned with engaging the children actively in social interactions which was comparatively analyzed with the typical developing children [10]. From the following study, it was determined that the use of individual's emotion and feelings could be effective in improving the child's behavior.

Globally, there has been a significant increase in the incorporation of psychosocial intervention to treat ASDs symptoms [11]. There are wide array of therapeutic interventions being put forward for ASDs treatment and from the investigations, it was concluded that intensive behavioural interventional helps in the ASDs treatment and was found that early treatment involving intensive behavioral interventions can help in improving the communicative and adaptive behavior of autistic children.

### 3. Methodology

#### 3.1 Research Methodology

The research methodology intends to determine the efficacy of behavioural intervention in improving the social skills of autistic children. The following section describes the experimental procedures that were carried out in analysing the thorough interaction of the social behaviours of the children with ASD. The study methodology and results are represented in the below sections.

The study was conducted on children who were diagnosed with moderate ASD symptoms through condition based screening from a special school in Pune. The study was conducted for the period of 12 weeks in assessing the social behaviour, before and during the behavioural therapy. The resulting data of the pre and during intervention was determined by using Whole Interval Recording Form by M.C Miller, Kreiners, J. Robinett, B.E. Freeman, R.L Smith, C.L. Baer, D. Palmer (2003). The resulted findings based on children's social and communication skills were further subjected to statistical interpretation.

#### 3.2 Ethical Validation

Prior intimation with written Consent was obtained from each parent of the participants which details about the purpose of the study. Adequate care was taken in order to maintain confidentiality by avoiding disclosure of identical information regarding the participants.

### 3.3 Methods

#### 3.3.1 Participants

The study involves children with ASD, who were selected based on the vocalization abilities, age and severity of disorder. The participants for the following study comprised of five children with autism who were selected based on the below mentioned criteria as follows.

-Vocalization abilities: The children must be able to perform vocalization techniques as a part of their repertoire. The children should not use sign languages, PECS, etc. for communications.

-Age: As the children gradually learn to socialize around the age of 6-7 years old. Therefore, this is the ideal age group for children to start learning about communication skills which is vital for social interactions.

-Severity of disorder: All the 5 children belong to mild to moderate level of autism according to Child Autism Rating Scale (CARS).

**3.3.2 Intervention procedure**

The intervention procedure that is carried out for the study involves Modelling prompt. Modelling prompt is an evidence based practice by which the model helps in demonstrating the target skill and the learner indulges himself/herself in imitating the skills. In this study all the participants were subjected to imitate what the adult model (i.e.) the therapist must indulge with the children to communicate with his fellow peers during an on-going conversation. The learners, (i.e.) the autistic children in this case, must imitate the skills after demonstration by the therapist. Their social interaction which involves in their participation to communicate with their peers was measured and recorded using Whole Interval Recording Form.

During the Pre-intervention study, the subjects were given the opportunity to show their communication skills, with each trial for 30 seconds. The data was recorded using whole interval recording. During interventional study, the adult model demonstrated a skill. The model showed the subjects on how to communication with a peer. The subject was further asked to imitate the skill that was taught by the model. The demonstration for each trial for the subject was for more than 30 seconds. The data was marked (X), if the subject was able to imitate the skill for at least 30 seconds, otherwise the data was marked as (O). The whole observation period for each session was for 5 minutes, and the intervention period comprised to a total of 20 sessions which were distributed on an even scale over the experimental period of 10 weeks. If the demonstration was successful, then each session concluded with positive reinforcement such as verbal praise or giving the child access to his/her favourite pastime activities. If the demonstration was unsuccessful, the session concluded with repetition of modelling prompt by the therapist, which intends to induce the subject to perform the activity in the next session.

**3.3.3 Statistical interpretation**

The statistical interpretations were determined using, Two sample t-test. This procedure imparts several data/reports for the comparison of two distributions, which includes confidence intervals involving the differences between the means. The test for assumptions and plots are available for this test. The data required for the test can be contained within two variables or even in one variable which is indexed using second (grouping) variable. In this case the statistical interpretations were determined based on the outcomes that are evaluated during the pre-intervention period and during intervention period. For the following studies, there are two variables in a data set, which comprises a total of 5 data in each set. The first set of data represents the data recorded during the pre-intervention study and the second set of data represents, the data which was recorded during the intervention study and the outcomes of the findings were represented in Table 1 and 2. In order, not to disclose the name and identity of the study subjects, each individual were provided imaginative names (S.B.1, S.P.2, etc.).

**Table 1. Statistical findings during the pre-intervention period**

Groups	Mean	N	Std. Deviation	Median	Minimum	Maximum
S.B. 1	2.700	10	1.636	3.00	0	5
S.P.2	1.273	11	1.191	1.00	0	3
A.A. 3	2.400	10	1.265	2.00	1	4
R.A. 4	1.273	11	1.104	2.00	0	3
C.D. 5	4.900	10	1.792	5.50	2	7

**Table 2. Statistical intervention during the pre-intervention period**

<i>Descriptive statistics pre-intervention</i>	
Mean	2.5091
Standard Error	0.6642
Median	2.4000
Mode	1.2727

Standard Deviation	1.4851
Sample Variance	2.2055
Kurtosis	1.5988
Skewness	1.2586
Range	3.6273
Minimum	1.2727
Maximum	4.9000
Sum	12.5455
Count	5
Confidence Level (95.0%)	1.8440

**Table 3. Statistical findings during intervention period**

Groups	Mean	N	Std. Deviation	Median	Minimum	Maximum
S.B. 1	7.700	10	2.263	8.00	3	10
S.P.2	3.667	9	2.121	3.00	1	7
A.A. 3	6.900	10	2.923	7.00	2	10
R.A. 4	4.222	9	2.333	5.00	1	7
C.D. 5	7.100	10	2.283	6.50	4	10

**Table 4. Statistical intervention during the pre-intervention period**

<i>Descriptive statistics during intervention</i>	
Mean	5.9178
Standard Error	0.8210
Median	6.9000
Standard Deviation	1.8358
Sample Variance	3.3703
Kurtosis	-2.8368
Skewness	-0.5402
Range	4.0333
Minimum	3.6667
Maximum	7.7000
Sum	29.5889
Count	5
Confidence Level (95.0%)	2.2795

**4. Results**

**4.1 Clinical Findings and outcomes**

Results from the pre-intervention and intervention (which were measured using Whole Interval Recording) were analyzed using independent sample t-test in Table 5. In order to determine whether there is a significant difference in the mean test scores during the pre-intervention and intervention period, the independent sample-t test was calculated assuming equal variance.

**4.2 Analysis and Interpretation**

An independent sample-t test was run on a sample population of 5 children and the data was acquired from 'Whole Interval Recording' to determine whether there was statistically significant mean differences observed between the pre-intervention period and during the intervention period. The therapeutic efficacy of the behavioral pre intervention (25.6 ± 14.33) and during the intervention was (57.6 ± 20.46), t (8) = 0.0210, which was less than 0.05 (p<0.05). This indicates there is significant difference between the two means. Hence, from the statistical analysis, we can determine that the children with ASD performed better during the intervention sessions.

**Table 5. Results of two sample t-test during pre-intervention and intervention**

	<i>Pre-intervention</i>	<i>During intervention</i>
Mean	25.6000	57.6000
Variance	205.3000	418.8000
Standard Deviation	14.3283	20.4646
Observations	5	5
Pooled Variance		312.0500
Hypothesized Mean Difference		0
Df		8
t Stat		-2.8642
P(T<=t) one-tail		0.0105
t Critical one-tail		1.8595
P(T<=t) two-tail		0.0210
t Critical two-tail		2.3060

**5. Discussions**

According to an internet survey on treatment options that were used for children with autism, the study showed that over 111 treatments were being used by parents for autistic children. From the survey it was implicated that applied behavioural intervention was one among the effective approaches following speech, visual and sensory integration treatment approaches [12]. A previous study reported that the autistic children showed significant improvement in their cognitive, language, adaptive and academic skills through intensive behavioural interventions over a period of four-years [13].

From the study, behaviour interventional showed significant improvement in the social communication skills of the subjects during the experimental period, as there were notable differences observed in each subjects in their response towards the adult model during the initial sessions and at the final session of the experimental period as they imitated the skills earlier than they had performed in the previous sessions. The current study intends to focus on behavioural interventions to improve their social communications, the study showed significant differences in their mean values, thus it proved likely, to be an effective intervention treatment approach for treating children with ASD lacking in social communication skills.

## 6. Limitations of the study

Although the study has reached its aim, there were certain unavoidable limitations of the study. The Whole interval recording in the study for certain occasions may underestimate the social interactions of the study subjects and also the procedure is quite time consuming in nature.

The familiarity of peers has some effect with growing time period after each session, as it might affect the participant's conversation during the intervention procedure. Some participants may become prompt dependent if the prompt is not faded properly. This prompting might actually be followed in certain occasions or to a particular study subject(s). Physical appearance of the adult model, who is demonstrating the intervention study, could also influence the study subject's participation. Most importantly, to those children with mild autism may show less difficulty and can learn the skills much faster than other children who has moderate level of autism.

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