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# Effectiveness of Applied Behavioural Analysis (ABA) executed by parents in Early Intervention Program for children with Autistic Features

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## Abstract

This particular study aim to evaluate the effectiveness of parents executed ABA techniques in Early Intervention programs for management of Autistic features among toddlers (development of eye contact, Participation in play, improving verbal reciprocal communication skill, developing self help skills and reducing repetitive behaviours). Sample size of the study is 6 children between 2 year to 3years 6 months, Screened as developmental delay ( Developmental Screening Test ) with at Risk to Autistic spectrum Disorder in Modified Checklist for Autism for Toddlers (M-CHAT). Diagnosed toddlers were regular to Early Intervention Unit and Department of Clinical Psychology; Thakur Hari Prasad Instiitute for intervention programs. ABA techniques such as Joint attention intervention, Task analysis, shaping, chaining, Prompting, Reinforcement, Modelling and fading used along with discrete trail analysis. Results of the study shows that, Pre and post scores from M-CHAT found to be differing in terms of reduction in Critical Items of M-CHAT which indicates ABA techniques used for the study is effective in Early Management of Autistic features among this group.

**Key words:** *Autistic features, Developmental Delay, Applied Behaviour Analysis, Early Intervention, and parents executed programs.*

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Autistic Spectrum Disorders (SADs) are a phenomenological related set of neuropsychiatric disorders. These conditions are characterized by patterns of both delay and deviance in multiple areas of development; typically their onset is in the first months of life (APA, 1994; Volkmar & Klin, 2005). Unlike the specific developmental disorders the ASD affects a wide range of functioning particularly social behaviour and language.

On March 27, 2014, the Centers for Disease Control and Prevention (CDC) released new data on the prevalence of autism in the United States. This surveillance study identified 1 in 68 children (1 in 42 boys and 1 in 189 girls) as having autism spectrum disorder (ASD). In India one in every 88 children today is born with autism spectrum disorder (ASD) against a ratio of one in 110 few years back, these statistics intricate growing trend of ASD. The essential features of autism spectrum disorder are persistent impairment in reciprocal social communication and social interaction (Criterion A), and restricted, repetitive patterns of behavior, interests, or activities (Criterion B). These symptoms are present from early childhood and limit or impair everyday functioning (Criteria C and D) .Autism spectrum disorder encompasses disorders previously referred to as early infantile autism, childhood autism, Kanner's autism, high-functioning autism, atypical autism, pervasive developmental disorder not otherwise specified, childhood disintegrative disorder, and Asperser's disorder. The impairments in communication and social interaction specified in Criterion A are pervasive and sustained. In the case of ASD diagnoses are most valid and reliable when based on multiple sources of information, including clinician's observations, caregiver history, and, when possible, self-report (DSM V; APA). If we could identify features of autism in infancy, treatment and management techniques can take full advantage of the young brain's remarkable plasticity. Although autism is hard to diagnose before 24 months, symptoms often surface between 12 and 18 months. If signs are detected by 18 months of age, intensive treatment may help to resolve deficits areas of the brain and reverse the symptoms. Some identification symptoms are no big smiles or other warm, joyful expressions, Doesn't make eye contact (e.g. look at you when being fed), no back-and-forth sharing of sounds, smiles, or other facial expressions, Lack of response to name, No babbling or "baby talk", Doesn't make noises to get your attention, No back-and-forth gestures, such as pointing, showing, reaching, or waving, Doesn't make noises to get your attention, Doesn't initiate or respond to cuddling, Doesn't imitate your movements and facial expressions, Doesn't reach out to be picked up and No meaningful two-word phrases that don't involve imitating or repeating. There are effective tools available for assessing autistic conditions in early developmental period itself. Checklist for Autism in Toddlers (CHAT) and Modified Checklist for Autism in Toddlers (M-CHAT) it assess above 16 month older, and Autism Diagnostic Interview-Revised (ADI-R) is for children above 2 years. Among these test extensively used screening tool Modified Checklist for Autism in Toddlers (M-CHAT), is scientifically validated tool for children between 16 and 30 months of age that assesses risk for autism spectrum disorder (ASD). The original version, the M-CHAT, was developed by neuropsychologists Diana Robins and Deborah Fein and clinical psychologist Marianne Barton. The M-CHAT-R's primary goal is to detect as many cases of ASD as possible. However, no screening tool is perfect. The American Academy of Paediatrics (AAP) recommends that all children receive autism screening at 18 and 24 months of age, and the M-CHAT is one of the AAP's recommended tools.

The main purpose of screening a condition is to take early remediation or treatment measures; Applied Behavior Analysis (ABA) is one of the evidence-based methods used to treat Autism. It is a systemic application of behavioral principles to address deficits in socially significant behavior, verbal skills and reasoning skills. The basis of applied behavioural analysis is ABC models A – Antecedent, B – Behavior and C – Consequence. The key aspects of ABA include observing the frequency of occurrence of behaviors as well as the antecedents to the behaviors and the consequences that follow the behaviors; breaking down desired skills into steps; teaching the steps through repeated presentation of discrete trials and collecting performance data to evaluate if there should be any changes over time (Prior, 2003). Applied Behavior Analysis approach teaches socially significant behaviors include communication, social skills, adaptive skills such as gross and fine motor skills, toileting, dressing, eating etc. It define as the process of systematically applying interventions based upon the principles of learning theory to improve socially significant behaviours to a meaningful degree, and to demonstrate that the interventions employed are responsible for the improvement in behaviour (Baer, Wolf & Risley, 1968; Sulzer-Azaroff & Mayer, 1991). ABA-based interventions have been popular with children with autism since the 1980s and can be linked to the work of Ivar Lovaas (1987). Lovaas' study of children diagnosed with autism at the Young Autistic Project led him to conclude that these children can learn most effectively using the ABA technique, particularly with a Discrete Trials methodology. He found that children that were receiving approximately forty hours per week of ABA demonstrated the greatest improvements in behavior. Francis (2005) noted that the intensity of the behavioral intervention was the most significant factor in predicting treatment outcome. The length of treatment also was critical in achieving successful outcomes; it was found that long-term treatment achieved better results than shorter-term treatment. The children with autism who received intensive ABA treatment made larger improvements in most skill areas than children who participated in the other interventions. Parents whose children received intensive ABA reported less stress than parents whose children received other treatments. In addition, the social behaviors of approximately one-half of the group became indistinguishable from the social behaviors of neuro-typical peers in a first grade class.

Parents are indispensable in the child's program; they play a necessary and critical role in child's overall development. Studies show that children whose parents are actively engaged in the process make measurable gains (Johnson, C.R., et al. 2007). The reasons are; first, no one knows the child better than the parent; the parent's provide critical and insightful information that will help guide the ABA program. Second, parents are able to continue to prompt and reinforce the child through his and her various daily activities –this is an essential component to generalizing skills.Criteria for a Comprehensive ABA intervention include trainer to child ratio (1:1, or low as appropriate) and training in a variety of settings, including home school and community, intensive treatment, Use of naturalistic teaching strategies, such as child-initiated interactions to teach functional skills. This intervention requires providing a stimulating environment, modelling play, providing choices, encouraging conversation and reinforcing reasonable attempts. Modelling - interventionist and parents demonstrate the target behaviour. Modelling is often combined with prompting and reinforcement strategies which can assist the child to acquire imitation skills.

Aim of the current experimental study is to find out the effectiveness of parents executed ABA as an intervention for developmentally toddlers with autistic features.

## Method

**Participants**

The study sample is composed of six developmentally delayed toddlers with autistic features as assessed by Developmental Screening Test and M-CHAT respectively, all sample were collected from early intervention unit, Thakur Hari Prasad Institute; Hyderabad, South India. Age range of the children are 2 year to 3 years 6 months; participants of the study were diagnosed cases of developmental delay (Developmental Screening Test) with at risk for Autistic spectrum Disorder in Modified Checklist for Autism for Toddlers (M-CHAT). Diagnosed Children were regular to Early Intervention Unit and Department of Clinical Psychology for intervention programs.

**Materials :**Pre test post test experimental study method used for the experimental study. Sample has been screened with the help of, M-CHAT and recorded pre test scores. The M-CHAT is an expanded American version of the original CHAT from the U.K. The M-CHAT has 23 questions using the original nine from the CHAT as its basis. Its goal is to improve the sensitivity of the CHAT and position it better for targeted population. Intervention given to parents, two sessions in a week, each session carry 45 minutes and total sessions give is 24. After the intervention post test conducted with M-CHAT and scores calculated to get mean difference and percentage between pre and post test score of each child.

**Procedure:** Applied Behavioural Analysis has been used for the study. Parents were educated and trained about current condition of the child along with demonstration of how to carry out the intervention at home. Following techniques were used in development of package used for the intervention. Parents were the co-therapist in this experimental study. Following techniques applied in the therapeutic sessions and training to the parents carried out with appropriate explanation and demonstration. Following techniques have been used for the present study.

**Joint attention intervention:** designed to teach a child to respond or initiate joint attention interactions. Techniques include: pointing to objects, showing items, activities to another, and following eye gaze.

**Task analysis:** in Task analysis process one activity is analyzed into its component parts so that those parts can be taught through the use of chaining: forward chaining, backward chaining and gradually total task presentation. In Chaining the skill to be learned is broken down into the smallest units for easy learning. For example, a child learning to brush teeth independently may start with learning to unscrew the toothpaste cap.

**Shaping:** it involves gradually modifying the existing behavior of a child into the desired behaviour. It is time consuming but shaping results in effective leaning outcome. This is paired with positive and doing a favourite activity immediately afterwards as a reward.

**Prompting:** parent or therapist provides assistance to encourage the desired response from the child. The aim is to use the least intrusive prompt possible that will still lead to the desired response. Prompts used include: Physical, demonstrational and verbal.

**Reinforcement:** Reinforcement provides a response to a child's behavior that will most likely increase that behavior. Difficult tasks reinforced heavily whereas easy tasks may be reinforced less heavily. We must systematically change our reinforcement so that the child eventually will respond appropriately under natural schedules of reinforcement (occasional) with natural types of reinforces (social).

**Modelling:** In Modelling complex social performance can be broken down into simpler steps and taught by trainer via modelling the correct behaviors while clients acquire them through repeated practice. The fundamental assumption underlying this technique is rehearsing specific behavioural skills through practice.

**Fading:** The overall goal is for a child to eventually not need prompts. This is why the least intrusive prompts are used, so the child does not become overly dependent on them when learning a new behavior or skill. Prompts are gradually faded out as then new behavior is learned.

**Discrete Trial Training (DTT)** - Breaks down learning opportunities into well-controlled, discrete child-trainer interactions then practiced around the house in more 'natural' settings that are subjected to repeated practice. DTT as a series of "teaching attempts" with each "attempt" called a "discrete trial" or sometimes just a "trial".

## Results

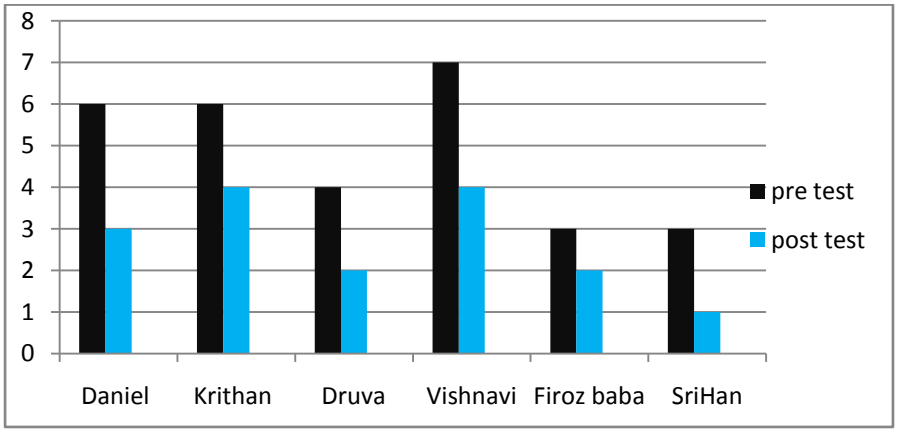
Table 1: shows age, presenting complaints, DQ and M-CHAT scores of each participant.

| S. No | Participants | Age | Presenting complaints | DQ | M-CHAT SCORE |
|---|---|---|---|---|---|
| 1 | Daniel Shah | 2 years 9 months | Doesn't reciprocate while talking to him<br>Seems to be he is in his own world<br>Doesn't sit at one place<br>Doesn't speak age appropriately | 81 | 6 |
| 2 | Krithan | 2 years | Doesn't reciprocate while talking to him<br>Doesn't show affection towards others<br>Lack eye contact<br>Doesn't show curiosity | 87 | 6 |
| 3 | Druva | 3 years | Lack eye contact<br>Doesn't participate in play<br>Lack imitative behaviour<br>Speech is delayed | 89 | 4 |
| 4 | Vishnavi | 2 years 11 months | Doesn't speak<br>Toilet training is not yet achieved<br>Doesn't maintain eye contact<br>Unusual finger moments near eyes | 87 | 7 |
| 5 | Firoz baba | 3 years 3 months | Doesn't responds when called by name<br>Poor eye contact<br>Lack attention in activities<br>Doesn't comprehend 3 step instruction | 76 | 3 |
| 6 | Sri Han | 2 years 10 months | Lack curiosity in things around him<br>Lack play engagement with other children<br>Stereotypical engagement with Alphabets<br>Toilet training is not present | 88 | 3 |

**Table 2: difference in mean and percentage of pre and post test scores of M-CHAT**

| Participants | Pre- Test scores | Percentage | Post-Test score | Percentage | Difference in pre to post test score | Difference in pre to post test percentage |
|---|---|---|---|---|---|---|
| Daniel | 6 with 2 critical item failed | 25% | 3 | 12% | 3 | 12% |
| Krithan | 6 with 3 critical item failed | 25% | 4 | 17% | 2 | 8% |
| Druva | 4 | 17% | 2 | 8% | 2 | 8% |
| Vishnavi | 7 | 29% | 4 | 17% | 3 | 12% |
| Firoz baba | 3 with 2 critical items failed | 12% | 2 | 8% | 1 | 4% |
| Sri Han | 3 with 2 critical items failed | 12% | 1 | 4% | 2 | 8% |

**Figure 1: Graphical representation of pre and post test scores and percentages of each child**




## Discussion

Lovaas' work on intensive early intervention with children with autism has raised considerable interest (see Lovaas *et al*, 1989). The possibility that 47% of children who were diagnosed with

autism during infancy or early childhood could gain apparently normal functioning and maintain this into adolescence is intriguing to researchers and has attracted considerable interest from parents. This raises the possibility that early intensive behavioural intervention may prevent later behavioural issues in children with ASDs.

Previous study of children diagnosed with autism can be incoperated with the findings of present study, and led us to conclude that these children can learn most effectively using the ABA technique, particularly with a Discrete Trials methodology. Francis (2005) noted that the intensity of the behavioral intervention was the most significant factor in predicting treatment outcome. The length of treatment also was critical in achieving successful outcomes; it was found that long-term treatment achieved better results than shorter-term treatment. The children with autism who received intensive ABA treatment made larger improvements in most skill areas than children who participated in the other interventions. Present study evaluated the effectiveness of ABA technique and analyzed the data collected from early intervention program for children at risk for ASDs. All the participants ( Parents of children with autistic features) in the study undergone 24 session ( 3 months) of ABA training program designed to develop eye contact, Participation in play, improving verbal reciprocal communication skill, developing self help skills and reducing repetitive behaviours and skill to engage socially appropriate behaviors.

Study results from Table 2 provide strong evidence on the impotence of consistency of training pattern which found to be other variable results in a highly positive outcome of the intervention program. ABA programs that need to be taught and applied daily and structured consistently in order to achieve positive results (Simpson, 2001). Parents as the integral part of child development they are the one who can make a big change in child's behaviours. This study emphasis that consistency, motivation and duration of the treatment carried by parents result in a positive outcome and greater amount of improvement in the child. As parents play a major role in child's development, the positive outcome of the intervention depend on the duration(length of treatment) of the intervention and intensity of the intervention which incorporate with previous studies by Lovaa's and Francis (1987, 2005).

The figure 1, graphical representation of reduction in scores indicates change in the pre and post test score of M-CHAT. The symptoms (poor eye contact, poor Participation in play, lack verbal reciprocal communication skill, no self help skills and repetitive behaviours) found in these children has been reduced in degrees. Study also also indicates effectiveness of Parents (caregiver) executed ABA technique to reduce severity of Autistic features among toddlers such as development of eye contact, Participation in play, improving verbal reciprocal communication skill, developing self help skills and reducing repetitive behaviours. The ABA techniques used in the study Joint attention intervention, Task analysis, shaping, chaining, Prompting, Reinforcement, Modelling and fading along with discrete trail analysis found to be effective in reducing autistic features among toddlers. This study also highlights consistent and continuous intervention and supervision from professionals to parents and caregivers for the maximum outcome out of intervention programs.

**Conclusion**

Study examined the effectiveness of parents executed ABA for the management of early childhood risk for Autism spectrum disorder among toddlers. Study results evaluate the

effectiveness of Applied Behavior Analysis with the use of Discrete Trials and parents as a co therapist role for the application of intervention. Results and evaluation of the data suggest that Applied Behaviour Analysis using Discrete Trials can be useful for development of eye contact, Participation in play, improving verbal reciprocal communication skill, developing self help skills and reducing repetitive behaviours when the intervention plans executed by parents with proper training in a consistent and persistent method. This study once again emphasise the importance of early intervention in management of ASDs and role of parents in early childhood development process and early intervention programs.

## References


1. American Psychiatric Association. (2013). Diagnostic and Statical Mannual of Mental Disorders (5th ed). Washington,DC.
2. Bear,D., Wolf, M.,& Risley, R. (1968). Some current dimensions of applied behavioural analysis. Journal of Applied Behaviour Analysis, 1, 91-97.
3. Filipek, P.A., MD et al (2000), "Practice Parameter: Screening and Diagnosis of Autism." Report of the Quality Standards Subcommittee of the American Academy of Neurology and the Child Neurology Society.
4. Francis K. "Autism interventions: a critical update". *Developmental Medicine and Child Neurology.*2005; 47( 7 ) : 493–499.
5. Johnson, C.R., et al. 2007. "Development of a Parent Training Program for Children with Pervasive Developmental Disorders." Behavioral Interventions 22(3):201-221
6. Lovaas, O.I. (1987) "Behavioral treatment and normal educational and intellectual functioning in young autistic children," Journal of Consulting and Clinical Psychology, 55, 3-9
7. National Research Council (2001) Educating Children with Autism. Committee on Educational Interventions for Children with Autism. Catherine Lord and James P. McGee, eds. Division of Behavioral and Social Sciences and Education. Washington, D.C.: National Academy Press.
8. Prior M. "Is there an increase in the prevalence of autism spectrum disorders?" *Journal for Paediatric and Child Health. 2003; 30(2):81-82.*
9. Sulzer-Azaroff, B. & Mayer, R. (1991). Behavioural analysis for lasting change. Fort Worth, TX: Holt, Reinhart & Winston, Inc.
10. Volkmar F, Koenig K, State M. Childhood Disintegrative Disorder. In: Volkmar F, Paul R, Klin A, Cohen D, editors. Handbook of autism and pervasive developmental disorders. John Wiley & Sons; Hoboken, NJ: 2005.
11. Volkmar FR, Klin A, Siegel B, Szatmari P, Lord C, Campbell M, Freeman BJ, Cicchetti DV, Rutter M, Kline W. Field trial for autistic disorder in DSM-IV. American Journal of Psychiatry.1994;151(9):1361–7.
12. World Health Organization. (1992).international statistical classification of diseases and related health PROBLEMS, 10th R revision (ICD-10). Geneva: WHO.
13. http://www.thelovaascenter.org/autism-aba-study.php
14. https://www.autismspeaks.org/what-autism/prevalence