



EFFECTIVENESS OF A PARENT-BASED INTERVENTION PROGRAM ON INDIAN CHILDREN WITH AUTISM SPECTRUM DISORDERS

Psychiatry

**Apoorva
Deshpande**

Sangamitra, 226, F block, 14th main, Sahakar Nagar, Bangalore-560092

Manju Bhargavi

Sangamitra, 226, F block, 14th main, Sahakar Nagar, Bangalore-560092

Nandini Mundkur

Sangamitra, 226, F block, 14th main, Sahakar Nagar, Bangalore-560092, Center for Child Development and Disabilities, 202, Sackhumvit House, New BEL Road, Bangalore – 560054

**Anusha
Jayaraman***

Center for Child Development and Disabilities, 202, Sackhumvit House, New BEL Road, Bangalore – 560054 *Corresponding Author

ABSTRACT

With increasing autism spectrum disorders (ASD) cases in India and the paucity of autism intervention professionals, it is imperative to train parents as interventionists. This study investigated the effectiveness of a parent-based intervention (PBI) program on the development of communication, socialization, and play domains in children with ASD. Thirty-seven age-matched children with ASD were divided into PBI and therapist-based intervention (TBI) groups. The PBI group parents underwent training from special educators. In the PBI group, 75%, 55%, and 65% children showed significant improvements after post-intervention session 1 (PS1) in communication, socialization, and play skills, respectively. All children continuing through PS3 showed significant improvements in these three domains. The overall study results for PBI and TBI groups were comparable based on the Early Start Denver Model (ESDM) checklist. We also observed greater parent empowerment and satisfaction among the PBI group parents.

KEYWORDS

Parent-based Intervention, Autism, Early Intervention

INTRODUCTION

Autism spectrum disorders (ASD) are characterized by difficulties in social-emotional interaction, communication and repetitive/restricted behaviors.^[1,2] Treatments for ASD include early behavioral intervention, developmental programs, and pharmacological management. The parent-child attachment bond is very important for a child in developing the brain's self-regulatory mechanism,^[3] developing an inter-personal self,^[4] and influencing later socio-emotional development.^[5] A promising pilot study called 'Infant Start', where parents learnt skills and continued intervention post-treatment was tested on 7 children between 7-15 months at risk for ASD. At 36 months, children showed significant improvements.^[6] A comprehensive meta-analytic review of parent-implemented intervention versus other forms of intervention for children with ASD aged 1-6 years not only showed improvements in social and communication skills in children, but also demonstrated an increase in parental knowledge, reduction in parental stress, and possible reduction in maternal depressive symptoms.^[7] Parental involvement in intervention extended the benefits of intervention to the home environment, thus contributing to the child's development.^[8-10]

In this study, we determined the effect of a parent-based designed to provide timely intervention to Indian children with ASD by training parents to be interventionists themselves.

METHODS

Thirty-seven children (29 boys, 8 girls; Age: 3-7 years) with ASD were evaluated using standardized tools for Indian children by a team of qualified developmental pediatrician and psychologists at our center. Their functional domains were evaluated pre-intervention using the Early Start Denver Model Curriculum Checklist (ESDM)^[11] in the areas of communication (receptive and expressive), social skills, and play skills. The children were then divided into two groups based on parents' choice of intervention – therapist-based intervention (TBI) group and parent-based intervention (PBI) group. Concurrent meetings with parents were conducted to understand the psycho-social factors such as parenting styles, financial stability, physical and mental health, stress levels, and support available at home. The post-intervention evaluations using ESDM checklist were performed at 6-month intervals. Our study was in accordance with the Helsinki Declaration of 1975, as revised in 2000, and written informed consent was obtained from parents of children enrolled in the intervention programs and from parents participating in the PBI program.

Therapist-based intervention

Parents dropped-off their children at our center for 1-h therapy sessions by ASD intervention therapists, 2-3 times a week. The activities and tools used in TBI were similar to those described below for PBI, with the notable difference of being conducted by therapists only. Parents were not able to dedicate much time at home for productive intervention. Parents met with the therapist once every 2 weeks to be briefed about the progress of their child.

Parent-based intervention

Parents participated actively in the intervention sessions of their children. Informative sessions and training sessions were conducted by well-trained special educators. A comprehensive intervention plan was then designed by parents under the guidance of the special educators that included an Individualized Education Plan (IEP) for enhancing the child's skills in social, communication, and play domains. The intervention plan began from the child's basal level of functioning. Activities included exercise routines, vocabulary development, circle time games, simple games taught in progressive steps of difficulty, cooking lessons, art and craft lessons. Tools used during the activities included locally available toys, flash cards, books, and educational aids. The IEP was delivered to children by parents in a structured and scaffolding manner for 3 h a day at the center and at least 2 h a day at home for 5 days, leading to a minimum of 25 h per week of the structured intervention program. The special educators guided the parents using modelling techniques and verbal feedback. During this, focus was also on sensitizing and empowering parents through weekly presentations on topics of sleep, nutrition, emotional development, pre academic skills, pre vocational skills. The IEPs were reviewed every month by special educators and parents. (Fig 1).

Statistical analyses

All data were analyzed using Prism 7. Repeated measures ANOVA was used to statistically compare the observed data. A *p* value of 0.05 or less was considered statistically significant.

RESULTS

Among 20 children enrolled in the PBI group, 11 completed three post-intervention sessions, 17 completed two post-intervention sessions, and all 20 completed at least one post-intervention session. Among 17 children enrolled in the TBI group, 4 completed three post-intervention sessions, 9 completed two post-intervention sessions, and all 17 completed at least one post-intervention session

According to our analyses in the PBI group, in communication skill, 15/20 children showed significant improvements after post-intervention session 1 (PS1) ($p = 0.00006$); all children continuing to PS2 and 3, showed significant improvements in communication ($p < 0.00001$, and $p < 0.00001$, respectively) (Fig. 2A). In social skill, 11/20 children showed significant improvements after PS1 ($p = 0.00041$); all children continuing to PS2, and 3, showed significant improvements in socialization ($p < 0.00001$, and $p < 0.00001$, respectively) (Fig. 2B). In play skill, 13/20 children after PS1 ($p = 0.00015$), 15/17 children after PS2 ($p < 0.00001$), and all children continuing to PS3 ($p < 0.00001$), showed significant improvements (Fig. 2C).

According to our analyses in the TBI group, in communication skill, 10/17 children showed significant improvements after PS1 ($p = 0.00021$); all children continuing to PS2, and 3, showed significant improvements in communication ($p < 0.00001$, and $p = 0.00013$, respectively) (Fig. 2D). In social skill, 10/17 children showed significant improvements after PS1 ($p = 0.01337$); all children continuing to PS2, and 3, showed significant improvements in socialization ($p < 0.00001$, and $p = 0.00002$, respectively) (Fig. 2E). In play skill, 9/17 children after PS1 ($p = 0.00167$), and all children continuing to PS2 and PS3 ($p = 0.00007$ and $p = 0.0014$, respectively), showed significant improvements (Fig. 2F).

DISCUSSION

In this study, we determined the effectiveness of a structured and timely parent-based intervention program for children with ASD. We observed that a structured intervention, started early, and extended to home environment by parents show significant positive changes in children's communication, social, and play skills. The results from our PBI program were at least comparable, and in few cases, better than the TBI program.

The findings of this study are in accordance with previous studies.^(12,13) McConachie and Diggle,⁽⁷⁾ in their systematic review of parent implemented early intervention for young children with ASD found that parent training indeed can be a successful intervention for ASD. Most previous studies on the effectiveness of parent involvement either provided initial training to parents in the form of workshops, or determined the combined effect of parent training with professional intervention methods. Our study is unique as parents received training on a continuous basis as long as their child was enrolled in the program. The parents delivered the program everyday under the supervision of qualified special educators.

One of the limitations of this study is the small sample size. Another limitation is the continuation of children in subsequent post-intervention sessions after PS1. This was primarily because when parents saw improvements in their children within PS1, they eagerly moved out to regular pre-schools. Among the three domains, the progress in the play domain was much slower in both groups. Play is complicated and requires certain negotiation skills, problem solving abilities, and a fluidic imagination, all of which are challenging for a child with ASD.

Several children in the PBI program showed improvements comparable to those in the TBI program. The more the duration of intervention, the better the prognosis was. In the PBI program, we observed additional benefits on parents themselves. The findings of the study are significant in the Indian setting where cost of therapy services is borne by parents. When parents are trained to become interventionists, they are filling the gap in the availability of professionals in autism intervention. Parents feel more empowered to train their children and are extremely satisfied when they see their children learn. They also experience better bonding with their children and less stress during therapy years.

Funding: None

Conflict of interest: The authors have no conflict of interest.

ACKNOWLEDGMENTS: The authors thank Ms. Nayanthara Ramamoorthy, Ms. Swathi, and Mrs. Padmapriya Ranganath for their assistance in the study.

FIGURE 1: Parent-based intervention program. The flowchart shows the complete step-by-step procedure involved in the parent-based intervention program at our center.

IEP - Individualized Education Plan; ESDM – Early Start Denver Model

FIGURE 2. Pre- vs. post-intervention ESDM levels in parent-based intervention program and therapist-based intervention program. Comparison of ESDM levels in communication (A), socialization (B), and play skill (C) showed significant improvements between pre-intervention and after PS1–3 of parent-based intervention. Comparison of ESDM levels in communication (D), socialization (E), and play skill (F) showed significant improvements between pre-intervention and after PS1–3 in therapist-based intervention. * $p \leq 0.05$. ESDM – Early Start Denver Model; PS – post-intervention session.

FIGURE 1

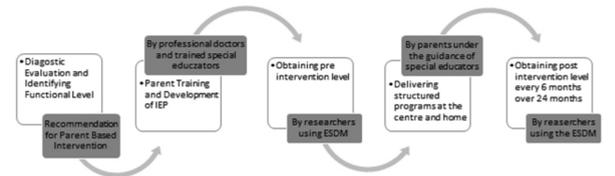
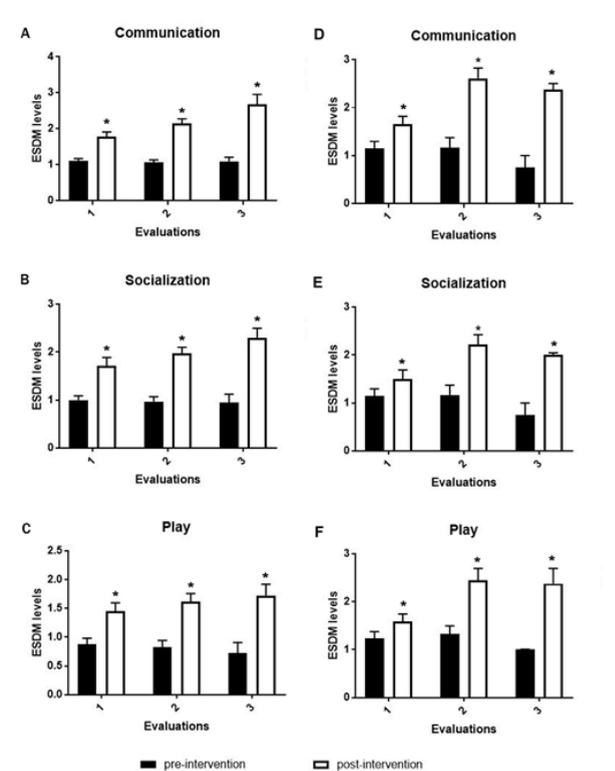


FIGURE 2



REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (5th Ed.). Arlington, VA: American Psychiatric Publishing; 2013.
2. Baron-Cohen S, Belmonte M. Autism: a window onto the development of the social and the analytic brain. *Annu Rev Neurosci* 2005;28:109–26.
3. Schore A. Back to basics attachment, affect regulation, and the developing right brain: linking developmental neuroscience to pediatrics. *Pediatr Rev* 2005;26:204–17.
4. Crittenden P. Peering into the black box: an exploratory treatise on the development of self in young children. In *Disorders and Dysfunctions of the self* (Vol. 5, p. 79); 1994.
5. Schore A. The experience-dependent maturation of an evaluative system in the cortex. In *Brain and values: Is a biological science of values possible* (pp. 337–358). Mahwah, NJ: Erlbaum; 1998.
6. Rogers S, Vismara L, Wagner A, McCormick C, Young G, Ozonoff S. Autism treatment in the first year of life: A pilot study of infant start, a parent-implemented intervention for symptomatic infants. *J Autism Dev Disord* 2014;4:2981–95.
7. McConachie H, Diggle T. Parent implemented early intervention for young children with autism spectrum disorder: a systematic review. *J Eval Clin Pract* 2007;13:120–9.
8. Mesibov G, Shea V. The teach program in the era of evidence-based practice. *J Autism Dev Disord* 2010;40:570–9.
9. Ozonoff S, Cathcart K. Effectiveness of a home program Intervention for young children with autism. *J Autism Dev Disord* 1998;28:25–32.
10. Ryan J, Hughes E, Katsiyannis A, McDaniel M, Sprinkle C. Research-based educational practices for students with autism spectrum disorders. *Teach Except Child* 2011; 43: 56–64.
11. Rogers S, Dawson G. Early start Denver model for young children with autism:

- Promoting language, learning, and engagement. Guilford Press; 2010.
12. Dawson G, Jones E, Merkle K, Venema K, Lowy R, Faja S, et al. Early behavioral intervention is associated with normalized brain activity in young children with autism. *J Am Acad Child Adolesc Psychiatry* 2012;51:1150-9.
 13. Dawson G, Rogers S, Munson J, Smith M, Winter J, Greenson J, et al. Randomized, controlled trial of an intervention for toddlers with autism: the Early Start Denver Model. *Pediatrics* 2010;125:e17-23.