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WORTHINESS OF EARLY INTERVENTION IN TODDLERS WITH AUTISM-PARENT CENTERED APPROACH

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Abstract

Background: Psychosocial treatments are the mainstay of management of Autism in India but the children are let to undergo the diagnostic test only after 4 years of age. This lacks the early identification of children with risk for Autism Spectrum Disorders leading to abstention of children from getting the prompt timely management. Lack of systematic evidence base for the effectiveness on management intervention is also found to be rare due to developmental heterogeneity. I aimed to carry out a holistic intervention on children to determine the overall development in Fine motor skill development, Gross motor skill development, Adaptive skill development, Cognitive development, Social communication development and Social development targeting parents as the mode of communication for their respective children in a randomized design against routine care alone. Methods: The intervention was given in addition to existing care with parent child involvement in all sessions of 4 hours' duration per day for 6 days and a day off for home activities. It aimed to educate parents and train them in the holistic development tailored to their child's individual competencies. Seventy children with risk for autism spectrum disorder were randomized between this treatment and routine care alone, stratified for age and baseline data. Outcome was measured 4 times at 2 months' interval from commencement of intervention, using standardized instruments. Results: All subjects studied met full M-CHAT-R™ criteria for risk for Autism Spectrum Disorder. Treatment and controls had similar routine care during the study period and there were no study dropouts after intervention had started. The active treatment group showed significant improvement compared with controls on the Final outcome measure – Assessment, Evaluation and Programming System for Infants and Children (AEPS®-3) total score in all the areas of Fine Motor, Gross motor, Adaptive skill, Cognitive Development, Social Communication and social development skills. Conclusion: A Randomized Two Group Pre Post Comparative Design of this kind in intervening children with risk for ASD is feasible and acceptable to parents. This study suggests significant additional treatment benefits following a targeted group of children less than 2 years when compared with routine care. The study suggests replication on larger samples for a longer time span for more accurate results. The research also encourages further RCT design studies in this area.

Indexed Terms: Assessment, Evaluation and Programming System for Infants and Children (AEPS®-3), Autism Spectrum Disorder (ASD), The Modified Checklist for Autism in Toddlers Revised, With Follow-Up (M-CHAT-R/F) ™.

INTRODUCTION

Autism has been a puzzle, a fascination and a massively researched area from the time of its discovery 60 years ago with addition of various related developmental disorders like Autistic disorder, Asperger's' syndrome [1], Pervasive developmental disorder not otherwise specified (PDD-NOS), childhood disintegrative disorder, and Rett's disorder that were brought together giving birth to Autism Spectrum Disorder which currently explains the qualitative impairments in social, behavioural, communicative and imaginative development, along with repetitive and stereotyped patterns of behaviour and interests [2, 3].

The term 'developmental' relates to the appearance of symptoms in the first two years of life. The fact on prevalence of children with autism is keeping India in the 21st position (88.50 per 10K children), the highest been Qatar (151.20 per 10k children)

and second highest been United Arab Emirates (112.40 per 10k children) [4]. Latest meta-analysis study (2018) provides evidences that about 1 in 100 children under 10 years of age in India has autism [5].

The concept of early intervention presents various methods comprehensive and non - comprehensive for children to cope up with the society in the later phase of their life. As seen in various studies, the intervention focuses on only certain developmental areas in a particular time span delineating the depletion of correlative development in other areas generating a disproportion in the totality of the child development.

A complete treatment program for an individual child is required as the children with risk for ASD are incapable in multidisciplinary areas, which was seem to be lacking in majority of the studies. Thus the study aimed at taking care of the development assessment and evaluation of the child holistically with all the areas being assessed at the same time to compare and correlate the influence of one area of development on another.

METHODOLOGY AND MATERIALS

A quasi- experimental study with quantitative research approach was carried out in a government undertaken autism training centre Trivandrum city, Kerala, India. the study population was all the children in Trivandrum District within 2 to 3 years diagnosed to have risk for ASD. Sample of the study included 70 children males and females, from nuclear families within the age range and from different religions. Data was collected by interviewing the parents randomly who visited various child developmental delay identification centres by enquiring about the health of their children, thus selecting the parent whose at least one child appeared to show deviation from normal behavior and those who voluntarily participated in the study through completing the demographic performa (which included name and age of the child, gender, religion, type of family, awareness on ASD and awareness on early intervention for risk for ASD) and completed the standard diagnostic tool for assessing risk for ASD among their children. Pilot study conducted for a twenty days' time period found to be feasible with reliable and valid standardized tool and helped move forward with the main study.

70 Subjects were equally randomly categorized into study and control groups were study group received research intervention (using the standardized tool- Assessment, Evaluation and Programming System for Infants and Children (AEPS®-3) along with routine care for 4 hours every day for 6 days with a day off, whereas control group received only the routine treatment from the training centre. The outcome was measured every second month on the same dates after the commencement of the intervention that lasted for a total of eight months.

Data Analysis

Both descriptive and inferential statistics were computed based on the objectives and hypothesis in order to examine the empirical evidence and explore the difference. All the categorical variables were summarized using frequency and percentage. Quantitative variables were summarized using mean and SD where data followed normality, for others used median and IQR [Q1 and Q3]. Chi square test was performed to assess significant difference in the baseline frequency distribution of demographic variables between experimental and control group (to ensure the groups are comparable). Two-way repeated measures mixed ANOVA was used to assess the effectiveness of intervention on various domains of skill and the overall skills.

Bonferroni correction was performed to adjust the Type-I error for multiple comparisons. Independent sample t test or ANOVA was performed to assess for significant association between overall development score and various domains of the development scores with selected demographic variables where data followed normality assumptions, and for others Mann Whitney U and Kruskal Wallis test were carried out. $p<0.05$ was considered as statistically significant and the entire analysis was preformed using SPSS and EZR software.

DISCUSSION OF RESULTS

Recommendations by the American Academy of Pediatrics that all children be screened for autism at 18 months of age oblige the development of interventions that are appropriate for toddlers with risk for developing ASD [6]. The present study on very young children was mandatory as this developmental disorder begins at the very young age of 1.5 years and goes unrecognized until the child reaches the age of four years to diagnose and further take relevant actions which is relatively very late with respect the effect on the treatment when compared to the early diagnosis and early intervention, that surely mandates improvement in the development of the children in all the areas. This study took up the experimental group, 35 very young children within the age group of 2-2.6 years (31.4 %) and 2.7-3 years (68.4 %) all coming from nuclear families, males (77.1%), majorities from Hindu religion (71.4%) with very little of their parents having knowledge regarding ASD (28.6%) and none of them aware on early intervention.

Table I: Frequency and percentage of demographic variables for both experimental and control group

Variables		Experimental Group (n=35)		Control Group (n=35)		Chi square test statistic (P value)
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)	
Age (in months)	24-30	11	31.4	10	28.6	0.068 (0.794)
	31-36	24	68.6	25	71.4	
Family type	Nuclear	35	100	35	100	-
	Joint	0	0	0	0	
Religion	Christian	6	17.1	4	11.4	1.24 (0.538)
	Hindu	25	71.4	24	68.6	
	Muslim	4	11.4	7	20.0	
Gender	Female	8	22.9	4	11.4	1.609 (0.205)
	Male	27	77.1	31	88.6	
Awareness on ASD	No	25	71.4	28	80.0	0.699 (0.403)
	Yes	10	28.6	7	20.0	
Awareness on AEPS®-3	No	35	100	35	100	-
	Yes	0	0	0	0	

The study showed that early age diagnosis and early age intervention was truly effective in terms of escalation in development in the areas of fine motor (64%) [Fig.1], gross motor (65%) [Fig.2], adaptive behaviour (77%) [Fig.3], cognitive behaviour (52%) [Fig.4], social communication (68%) [Fig.5], social behaviour (78%) [Fig.6], overall (66%) when compared to the other group of children showing only 51 % of growth in the overall development.

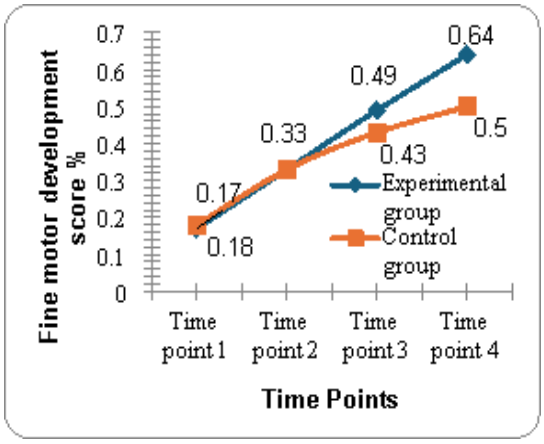

Figure 1: Profile plot showing change in Fine motor development score across time between groups

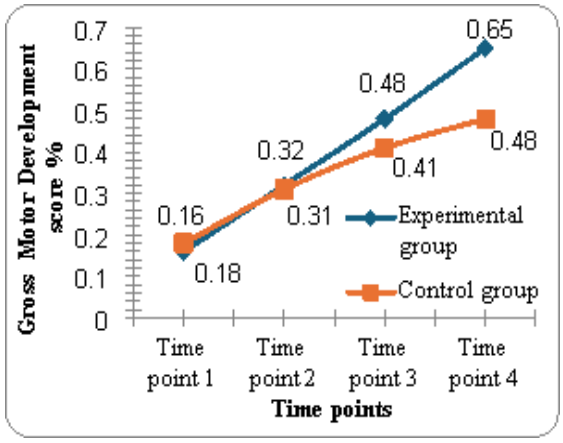

Figure 2: Profile plot showing change in Gross motor development score across time between groups

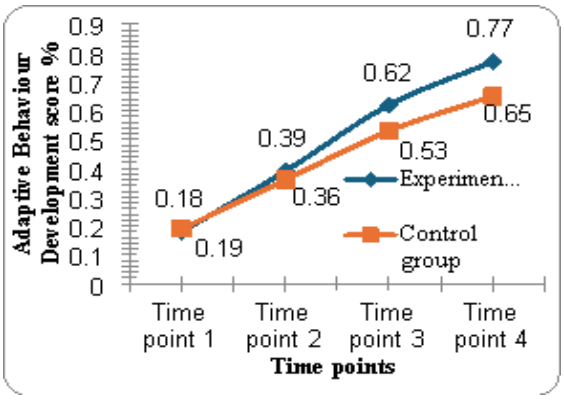

Figure 3: Profile plot showing change in Adaptive Behaviour Development score across time between groups

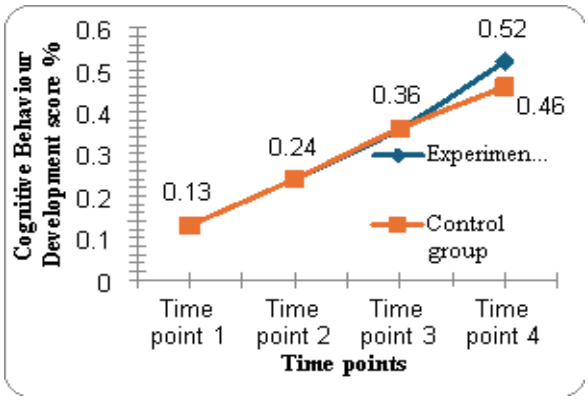

Figure 4: Profile plot showing change in Cognitive Behaviour Development score across time between groups

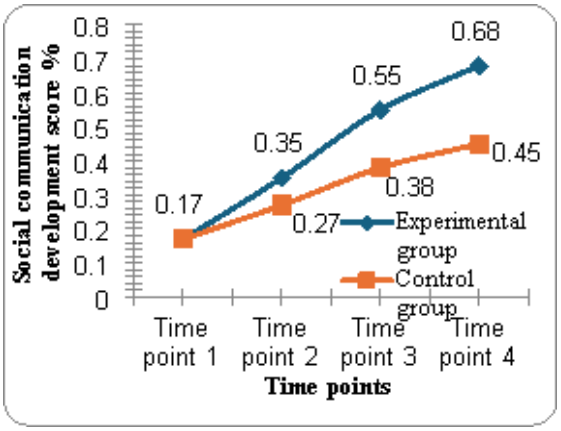

Figure 5: Profile plot showing change in Social communication development score across time between groups

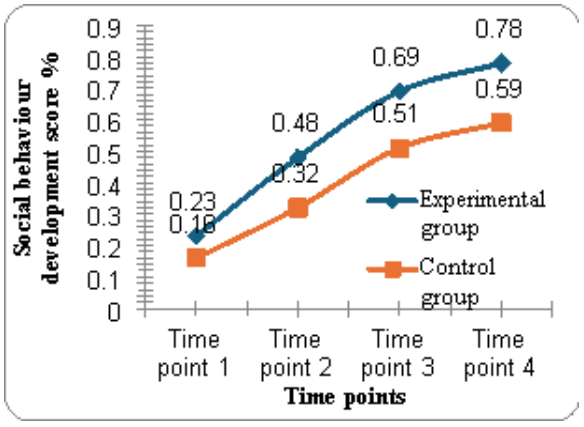

Figure 6: Profile plot showing change in social behaviour development score across time between groups

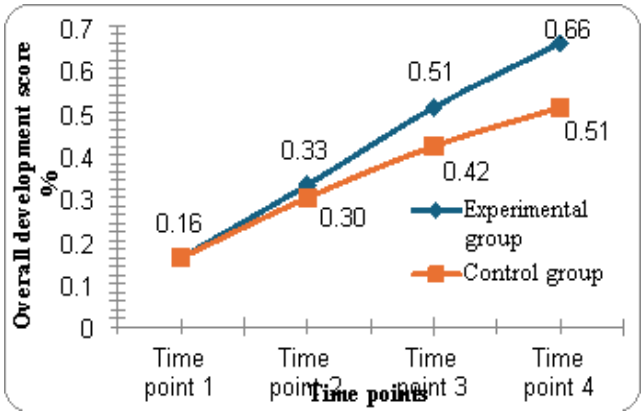

Figure 7: Profile plot showing change in Overall development score across time between groups

The outcomes of this study will greatly help the community and family with respect to adoption of the methods to carry out an effective intervention plan for the development skill among their children with risk for developing ASD.

CONCLUSION

The research has substantial implications for families and the broader community. It demonstrates that early and comprehensive intervention strategies, involving both clinicians and parents, can lead to better developmental outcomes for children. This collaborative approach ensures that children receive consistent support across different environments, enhancing the effectiveness of the intervention.

However, additional high-quality research is required to fully understand the impact of prodromal interventions, establish adaptive treatment pathways for low responders, personalize intervention approaches, sustain treatment effects, define the active ingredients of intervention approaches, determine the optimal timing for targeting specific skills, and maintain treatment effects over time. Future studies should focus on these areas to further refine and improve early intervention strategies for children with ASD.

Furthermore, this study highlights the need for expanding expertise in this field, particularly in nursing practice, teaching, administration, and research. Enhancing knowledge and skills in these areas will ensure that practitioners can provide the best possible care and support for children with ASD and their families.

In conclusion, this research provides compelling evidence that early diagnosis and intervention are among the most effective strategies for enhancing children's development across multiple domains. Implementing systematic early screening and intervention programs can lead to markedly better developmental trajectories for children with ASD.

These findings should inform policy and practice, emphasizing the importance of early and comprehensive intervention to maximize developmental outcomes and provide children with the best possible start in life. Future research should aim to replicate these findings in larger and more diverse populations, further validating the effectiveness of early intervention strategies and informing best practices in the field.

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