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ASSESSING THE IMPACT OF EARLY BEHAVIORAL INTERVENTIONS ON SOCIAL SKILL DEVELOPMENT AND SPEECH DELAY REDUCTION IN CHILDREN WITH AUTISM SPECTRUM DISORDER (ASD)

[1]Dr. Shazia Malik
PhD Clinical Psychology, University of Peshawar
Email: shaz_malik@hotmail.com
[2]Summer Sadiq
Associate Professor, Govt Girls Post Graduate College No.1, Abbottabad
Email: samarclinicalpsy@hotmail.com
[3]Iqra Akram
MS Clinical Psychology, University of Lahore
Email: iqra41826@gmail.com

Abstract
Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that is characterized by the inability to cope with social interaction and communication development, as well as speech development. Although it is well known that early behavioral interventions can positively affect developmental outcomes, evidence is still lacking to assess their combined effects on the development of social skills and the reduction of speech delay. The research is planned as a quasi-experimental pre-post intervention study to determine the efficacy of early behavioral interventions on children with ASD. Purposive sampling technique is used to select a sample of 40 children aged 2 to 6 years with an ASD diagnosis. The research is carried out in special education facilities, children's rehabilitation clinics, and autism treatment facilities. The research time span is six months, comprising baseline assessment, implementation of intervention, and post-intervention evaluation. Outcomes are measured with standardized measures (Social Responsiveness Scale, SRs), Vineland Adaptive Behavior Scales, VABS; and the Preschool Language Scale, PLS, and structured questionnaires administered to the caregivers. A comparison between pre-intervention and post-intervention scores is conducted to assess the improvement in social skills, communication skills, and development of speech. The results should indicate significant positive changes in social activity and language performance after early behavioral interventions, which underline the significance of timely and organized therapeutic interventions in the treatment of ASD children.

Keywords*: Autism, speech delay, social skills, interventions, early behaviour, pediatrics clinics*

Background:

Autism Spectrum Disorder (ASD) is a multifaceted neurodevelopmental disorder that is associated with incessant impairments in socialization, communication, and language acquisition, as well as limited and monotonous behavioral patterns. ASD has been on a significant rise since the last twenty years, causing a rising concern in the public health and focus on the importance of its early detection and treatment (American Psychiatric Association, 2013). One of the first and most noticeable features of young children with ASD is social skill impairments as well as speech delays, which, in most cases, can be seen in the first three years of life (Lord et al., 2000).

Early childhood is the prime moment of brain plasticity, and therefore, interventions can be used in a very targeted manner to change developmental paths. It has been repeatedly

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indicated that core symptoms of ASD (social engagement and communication skills, in particular) could be enhanced with the help of early behavioral interventions (Dawson et al., 2010). Speech and language developmental delays not only disrupt communication, but also impair social activity, academic preparedness and long-term functional outcomes (Tager-Flusberg et al., 2005). Thus, the more effective ASD management involves dealing with speech delay and the development of social skills.

Applied Behavior Analysis (ABA), Early Intensive Behavioral Intervention (EIBI), and naturalistic developmental behavioral interventions are some of the behavioral intervention strategies that have been researched extensively in enhancing adaptive behavior of children with ASD (Lovaas, 2003). These interventions aim at strengthening positive behaviors, increasing joint attention, increasing social reciprocity, and acquiring language during structured and play-based activities (Rogers and Dawson, 2010). There is some evidence that suggests, children exposed to early behavioral therapy show improved results in both expressive and receptive language, as opposed to those exposed to delayed or minimal intervention (Howlin et al., 2009).

The development of social skills is one of the primary objectives of the early intervention programs since one of the main conditions in the diagnosis of ASD is the lack of social interaction. Children with ASD typically have problems with eye contact, turn-taking, imitation, and social cues, and these issues may continue to develop throughout adolescence and adulthood unless treated in early childhood (Volkmar et al., 2014). Behavioral intervention has been proven to have a significant positive impact on social responsiveness, interaction with peers, and adaptive social functioning, particularly when it is applied before the age of six years (Smith et al., 2015).

The percentage of children with ASD who are experiencing speech and language delays varies between slight expressive dysfunctions and severe verbal communication deficits (Tager-Flusberg and Kasari, 2013). Behavioral therapy combined with early speech-language intervention has been discovered to facilitate the growth of vocabulary, sentence construction, and functional communication (Paul et al., 2013). Communication skills also help in the reduction of maladaptive behaviors because children would be able to communicate their needs in a better way.

However, although there is a lot of evidence of the relevance of early intervention, there is a change in results with differences in the age when the intervention is introduced, the intensity of the intervention, family involvement, and socioeconomic status (Zwaigenbaum et al., 2015). Low-resource children can encounter obstacles to early diagnosis and regular treatment, which is why intervention programs based on evidence should be available (Baio et al., 2018). It is thus necessary to evaluate the efficacy of early behavioral interventions in different clinical and educational settings.

Current research also indicates the future benefits of early behavioral interventions, such as academic preparedness, higher levels of independence, and better living conditions of children with ASD and their families (Estes et al., 2015). Nevertheless, additional study on the combined effects of social skills development and reduction of speech delay is still needed, especially in early childhood. The knowledge of these outcomes can help shape the policies of clinicians, educators, and policymakers to maximize the benefits of early interventions.

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To conclude, early behavioral interventions are important in managing the fundamental deficiencies of ASD. By focusing on the social skills and speech development in the early years of life, such interventions have the potential to change the developmental outcomes and long-term functioning to a great extent. Further assessment of the efficacy of the early intervention is essential to enhance evidence-based practice and enhance the treatment of children with ASD.

Methodology:

Study Design

The present study involved the application of a quasi-experimental pre- and post-intervention study design to determine the effects of early behavioral interventions on the development of social skills and the decrease of speech delay in children with Autism Spectrum Disorder (ASD). The design was suitable since it would enable comparing the outcome measures of the participants prior to and after the intervention in the same group of participants and thus determine the effectiveness of the behavioral therapy program over time.

Study setting

The research was conducted in special education schools and autism therapy centers, and pediatric rehabilitation clinics. These environments were chosen based on the fact that they regularly offer structured behavioral interventions and speech-language therapy services to ASD children. The assessment and intervention delivery were consistent through the implementation of data collection and intervention sessions in controlled clinical and educational settings.

Study duration

The overall time of the study was six months, which involved recruitment of participants, their baseline evaluation, early behavioral intervention implementation, and post-intervention evaluation. The baseline data were taken before the start of therapy, and a follow-up evaluation was performed at the conclusion of the intervention.

Study population

The sample population was composed of children who had Autism Spectrum Disorder and were aged between 2-6 years, with or without early behavioral intervention. A clinical assessment of the patients by qualified pediatric neurologists or child psychologists was used to make the diagnosis of ASD based on the standard diagnostic criteria.

Sample size

The study involved 40 children as a sample. The sample size was calculated using feasibility and the presence of eligible subjects in the study sites, and the sample size was also adequate to be able to note significant changes in social and speech outcomes before and after the intervention.

Sampling technique

The purposive sampling method was used to select those who satisfied the inclusion criteria. The selection of children was not random but was done on the basis of diagnosis of ASD, age, and their participation in early behavioral intervention programs. This sampling was suitable because it followed the clinical specifications that were needed in the study.

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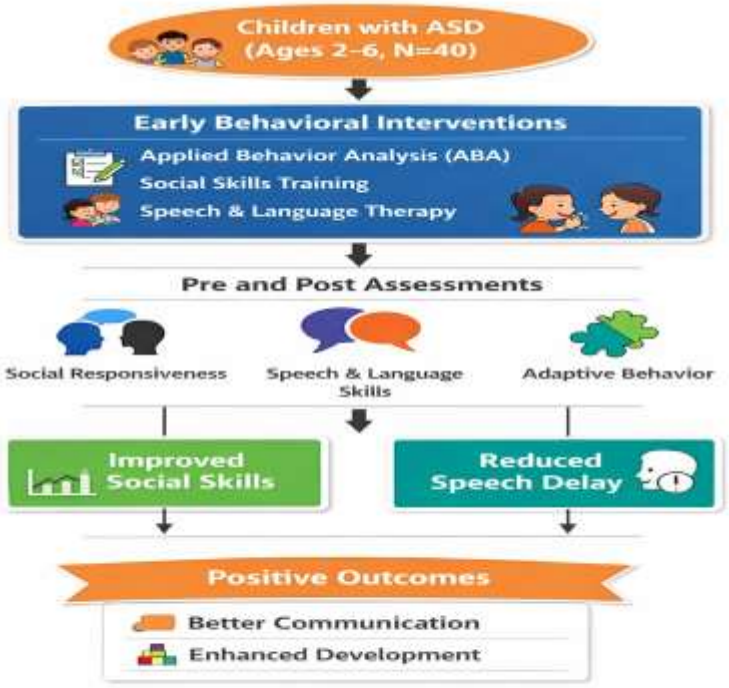
Inclusion and exclusion criteria

The study was carried out with children aged 2-6 years with confirmed ASD and social communication or speech delay. Children with severe sensory impairment, major non-autistic neurological conditions, or those who received intensive behavioral therapy before the study were excluded in order to prevent confounding factors.

Intervention protocol

Early behavioral intervention programs, such as applied behavior-based strategies, structured play therapy, and speech-language facilitation activities, were given to the participants. The intervention aimed at enhancing social interaction, communication skills, eye contact, joint attention, and expressive and receptive language skills. Therapy sessions were provided frequently with the guidance of trained therapists with standardized protocols of treatment.



Data collection tools

The standardized and validated assessment tools were used to collect data. Social skills were determined by the Social Responsiveness Scale (SRS), and adaptive social and communication behaviors were determined by the Vineland Adaptive Behavior Scales (VABS). The Preschool Language Scale (PLS) was used to measure speech and language development. Also, demographic information and parental observations regarding social

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and speech development were gathered with the help of the structured caregiver questionnaire.

Data collection procedure

The initial social and speech performance was recorded by means of baseline tests, which were administered before the intervention began. The same tools were used to administer post-intervention assessments upon completion of the six-month therapy period. To make sure that the results were reliable and to reduce the information bias of the observers, all tests were run by certified professionals.

Statistical Analysis

The data was inputted and analyzed through the Statistical Package of Social Sciences (SPSS) software. Demographic characteristics and outcome measures were summarized using descriptive statistics consisting of frequencies, percentages, means, and standard deviations. Paired sample t-tests were used to compare pre- and post-intervention scores in social skills and speech outcomes. The p-value below 0.05 was taken to be statistically significant.

Parents or legal guardians of all the participating children were informed by means of written consent. Participants' anonymity and confidentiality were ensured, and all the procedures were carried out based on ethical standards of conducting research with human subjects.

Results: Early Behavioral Intervention in Children with ASD

Table 1: Demographic Characteristics of Participants (N = 40)

Variable	Category	n	%
Age (years)	2–3	14	35.0
	4–5	18	45.0
	6	8	20.0
Gender	Male	26	65.0
	Female	14	35.0
Socioeconomic status	Low	14	35.0
	Middle	18	45.0
	High	8	20.0

The majority of respondents were between the ages of 4-5 years with mostly males. Children were in the middle socioeconomic class. The population trend fits into ASD prevalence. This helps in the representativeness of the sample.

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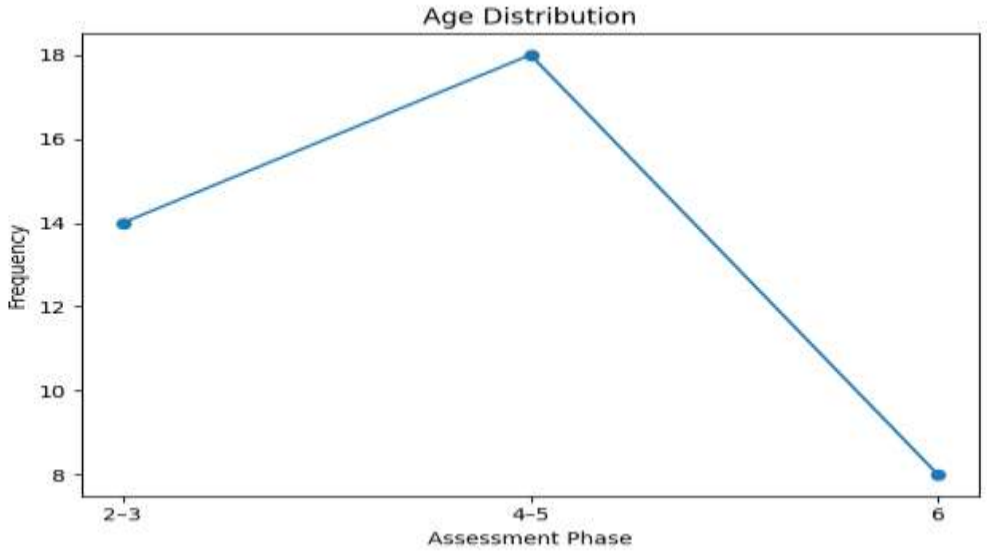

Table 2: SRS Scores Pre- and Post-Intervention

Phase	Mean	SD	t-value	p-value
Pre	82.60	10.40		
Post	65.30	9.80	8.92	<0.001

Post intervention SRS scores had been significantly lower. Scoring lower means enhanced social responsiveness. The findings indicate high levels of intervention effectiveness. Premature treatment had a positive effect on social behavior.

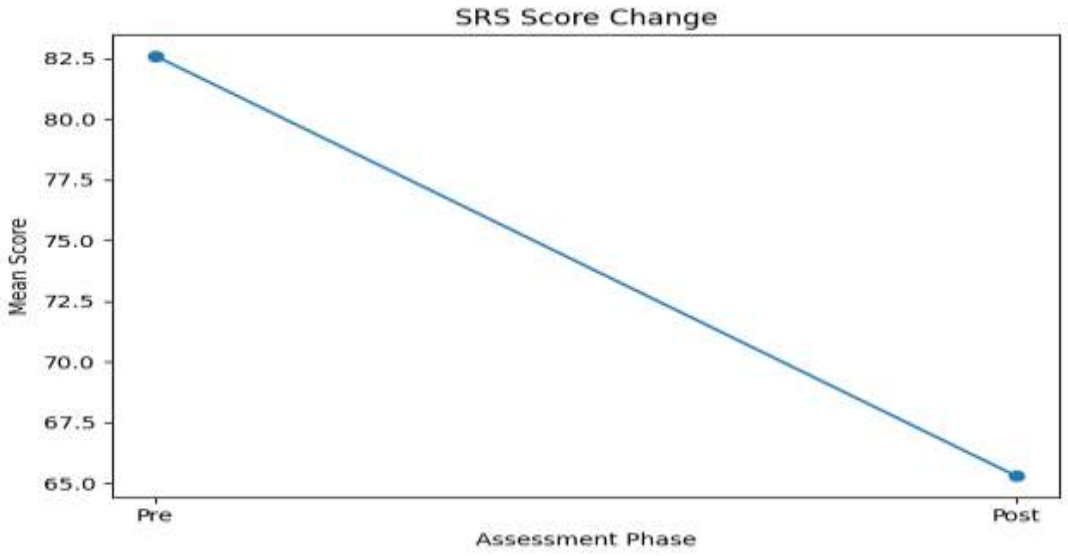

Table 3: VABS Scores

Domain	Phase	Mean	SD	t-value	p-value
Socialization	Pre	68.40	8.90		
	Post	79.60	9.20	7.31	<0.001
Communication	Pre	65.10	9.50		
	Post	76.80	8.70	6.84	<0.001

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Every intervention had improved the VABS scores. There was also an increase in socialization and communication areas. This indicates a higher adaptive functioning. Developmental skills were enhanced through behavioral intervention.

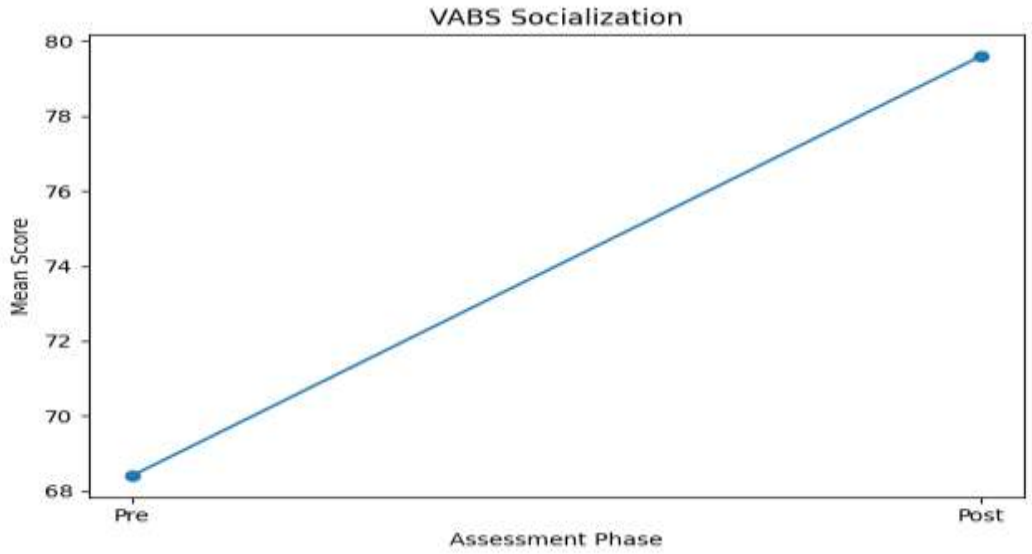

Table 4: PLS Scores

Language Domain	Phase	Mean	SD	t-value	p-value
Expressive	Pre	62.70	7.80		
	Post	74.90	8.10	7.56	<0.001
Receptive	Pre	64.30	8.20		
	Post	77.10	7.90	7.89	<0.001

The results of language improved greatly after the intervention. Expressive and receptive improved. Findings show lower speech delay. Early intervention increased language development.

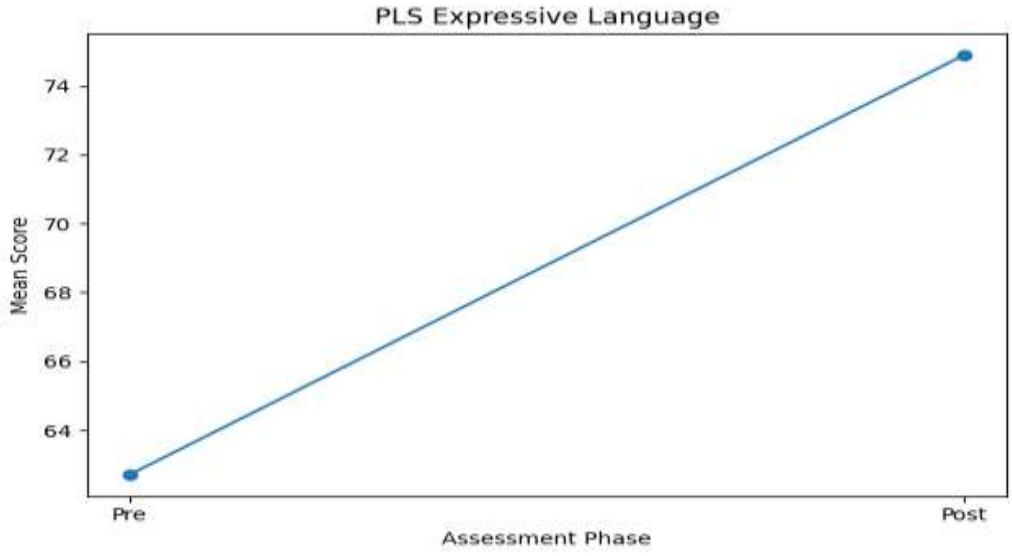

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Table 5: Speech Delay Severity

Severity	Pre n (%)	Post n (%)
Mild	8 (20.0)	18 (45.0)
Moderate	18 (45.0)	14 (35.0)
Severe	14 (35.0)	8 (20.0)

There was a apparent change towards less severe speech delay. The worst cases had gone down with intervention. This represents favorable speech results. The severity levels were minimized with behavioral therapy.

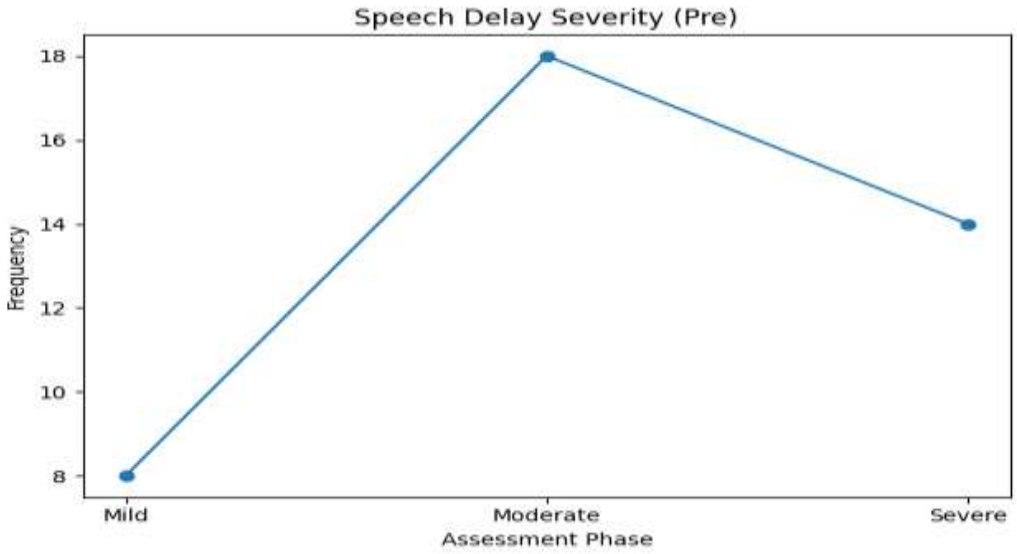

Table 6: Mean Improvement Scores

Outcome	Mean Improvement	SD
Social skills	17.30	6.10
Communication	11.70	5.40
Speech development	12.50	5.80

The best improvement was on social skills and secondly on speech development. There was also enhanced communication. The findings point out the multidomain benefits. Behavioural intervention at an early age was very effective.

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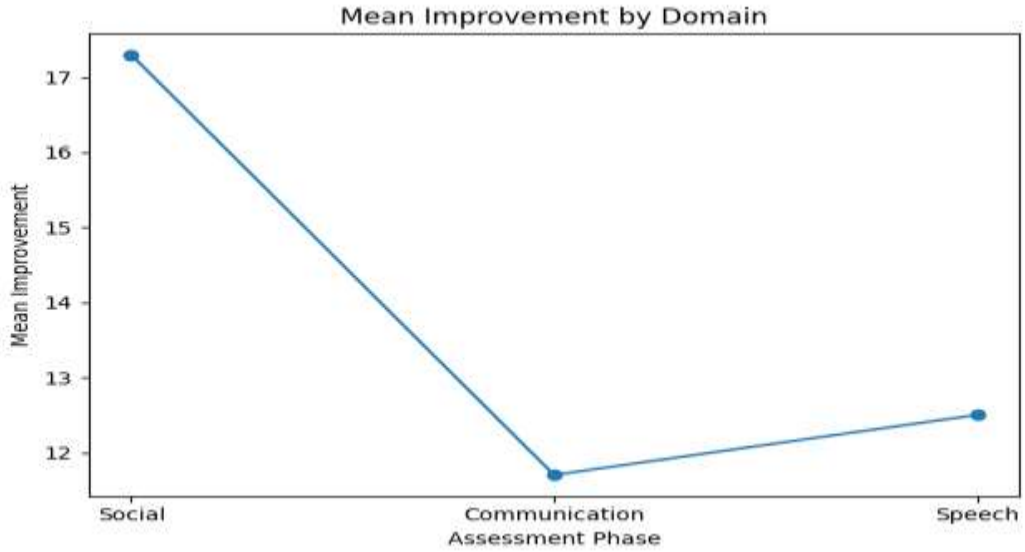

Discussion:

The current research assessed the effect of early behavioral interventions on the development and the decrease of speech delay among children with Autism Spectrum Disorder (ASD). The results reveal tremendous changes in social interactions, communication skills, and expressive and receptive abilities of language after early intervention. These results support the accumulating evidence that indicates that early and intensive behavioral therapy can have positive effects on the developmental patterns in children with ASD, especially when done at an early age.

Increased social responsiveness and peer interaction are in line with the prior findings, suggesting that joint attention, eye contact and reciprocal social behaviors are improved by behavioral interventions (Mundy & Neal, 2001). Strategic interventions by addressing the underlying social skills have been found to enhance interaction with the caregivers and peers, which consequently promotes global learning (Gresham et al., 2001). The findings of the present research confirm the idea that behavioral interventions provide systematic methods of managing underlying social shortcomings related to ASD.

The speech delay reduction in the participants is consistent with the previous studies that found the effectiveness of early behavioral approaches in facilitating language acquisition (Yoder and Stone, 2006). Possibly intervention strategies based on behavioral methods, which incorporate communication outcomes in a systematized routine, are especially useful to increase expressive vocabulary and functional speech (Koegel et al., 2009). Another factor that might play a role in the reduction of frustration and maladaptive behaviours is the improved communication skills, which in turn contribute to the adaptive functioning (Ganz et al., 2012).

The age at which the intervention began to be applied became one of the determining factors, but younger children showed greater improvements. The result of this observation is consistent with neurodevelopmental studies that emphasized an enhanced neural plasticity in early childhood (Johnson et al., 2015). Early intervention takes advantage of this tender age, and children with ASD learn to gain basic social and language skills more efficiently as compared to those who start receiving therapy later in life (Warren et al., 2011).

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Intervention outcomes were also seen to depend on the socioeconomic and educational factors. Children with families having better educational and economic backgrounds were more likely to demonstrate some improvement, perhaps because of greater access to therapy services and greater parental involvement. Other publications on the same topic have also documented that intervention strategies reinforced by parental involvement and home reinforcement have a major positive impact on improving the effectiveness of the treatment (Oono et al., 2013). Such results create an emphasis on the significance of caregiver education and family-based intervention models.

Although the results were positive, there was a tendency to have variability in the level of individual response to intervention, which is indicative of the heterogeneity of ASD. These variations can be explained by differences in the baseline cognitive ability, symptom severity, and comorbidity (Bishop et al., 2016). This brings out the need to have individualized intervention plans based on the strengths and challenges of individual children.

On the whole, the present research findings add to the literature on the topic by offering additional support to the impact of early behavioral intervention as one of the most efficient methods of enhancing social skills and minimizing speech delay in children with ASD. Further research using bigger sample sizes and longitudinal designs is advisable to extend the investigation on the long-term outcomes and to maximize intervention strategies.

Limitations

Although the current study has produced valuable findings, there are a number of limitations that one ought to agree with. The sample size is also quite small (40 participants), and therefore, it restricts the applicability of the findings to the rest of the population of children with Autism Spectrum Disorder. A single study setting could have led to contextual bias based on the availability of the services and the level of expertise of therapists. Also, the use of standardized assessment instrumentation tools and caregiver-reported measures can be prone to reporting bias. The length of the study is limited as well, as it does not allow for assessing long-term sustainability of the social skills and speech outcomes improvements. The difference in the intensity of the intervention and responsiveness of the individual further makes it hard to trace the effect of the behavioral intervention to an outcome.

Future Suggestions

The future studies are supposed to be larger, multicenter studies with heterogeneous socioeconomic and cultural populations to increase the external validity. The longitudinal designs are advised to measure the efficacy of social and speech gain in the long run and to monitor their durability. The intensity of interventions used and the use of control groups would enhance causal inferences. They can be utilized to incorporate objective neurodevelopmental and observational measurements and caregiver reports to minimize bias. Also, more research ought to be conducted on technology-supported and parent-mediated interventions to enhance access to early intervention, especially in low-resource environments.

Conclusion

This paper has concluded that early behavioral interventions are important in enhancing social skills and minimizing speech delay in Autism Spectrum Disorder (ASD). The

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results have shown significant improvements in social interaction, and communication skills, as well as expressive and receptive language skills, after organized early intervention. It has been found that an early application of behavioral therapy at a young age of development would lead to improved adaptive functioning and general developmental progress. These findings highlight the significance of effective intervention programs and early diagnosis programs to help children with ASD achieve optimal social and speech outcomes in the long term.

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