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Speech Therapy Outcomes in Children with Autism Spectrum Disorder: A Longitudinal Study

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Abstract
International research over the last decade has put increasing emphasis on the need for long-term, structured therapeutic input. Longitudinal studies indicate that sustained speech-language intervention strengthens vocabulary acquisition, symbolic communication, narrative skills, and engagement in reciprocal interactions. Existing literature related to Pakistan is limited due to short follow up period and is insufficient to provide robust outcomes. Therefore, this study focused on longitudinal study extended up to fourteen months under the strict and controlled surveillance of professionals. The main aim of the study was to assess the effectiveness of sustained speech therapy over children with ASD. The present longitudinal study was carried out for fourteen months from the period January 2024 to February 2025. In two reputable institute of Karachi, Pakistan. The study set criterion for the selection of age of children, and children were selected between 4 to 8 years of old and were also registered within those institutes. It was also made sure that these children must be enrolled in Speech therapies programs. The consent of parents was taken in written form. ATEC was used to capture behavioral and communicational functioning, and well-structured observational checklists were used for the assessment of spontaneous verbal behavior, joint attention episodes, and social communication indicators during their therapy sessions. The results depict the effectiveness of speech therapy in which baseline, midterm and final score records are shown for the 14 months of intervention period. Appearance in an upward trajectory for the participants with the score of baselines averaging in the mid forty (40), with follow-up of steady rise of 10 points by the evaluation of midterm and with an addition of 10 to 12 points in the final assessment. This study could contribute to devising a policy framework at government for the children with ASD and may assist the understanding of global research community for the assessment contextual based impact.

Keywords: Speech Therapy, Autism Spectrum Disorder (ASD), Children, Participants, communication

Introduction

Globally, it has been observed that a complex neuro condition known as autism spectrum disorder (ASD) is increasing within children. This condition reveals various significant differences in communication, social reciprocity and behavioral flexibility and affects the speaking ability of

children over time (Johnson et al., 2007; Khalid et al., 2020; Vivanti et al., 2013).These developmental challenges emerge because of idiosyncratic neural processing patterns that compromise expressive and receptive language abilities, joint attention, and the ability to apply communication strategies flexibly in social contexts. Out of the many interventions currently available, speech therapy has always been considered pivotal to promoting functional communication in children with ASD, but rates and patterns of improvement for individuals are significantly dependent on level of cognitive ability at time of treatment initiation, age at diagnosis, presence of comorbid disorders, family involvement and intensity of intervention(Thurm et al., 2015). International research over the last decade has put increasing emphasis on the need for long-term, structured therapeutic input. Longitudinal studies indicate that sustained speech-language intervention strengthens vocabulary acquisition, symbolic communication, narrative skills, and engagement in reciprocal interactions (Frazier et al., 2021; Thurm et al., 2015). These global findings provide substantial evidence of the long-term benefits of speech therapy, though children do not progress uniformly, and therapeutic gains are shaped both by individual neurodevelopmental features and contextual factors, such as family communication styles and educational support systems.

Many of the correctional studies have been conducted in several parts of world, offering an in-depth analysis of how children acquire communication skills within therapeutic interventions. Studies conducted in North America and Europe have designed a framework that serves as persistive and pragmatic communication interventions in early time of children (Mouridsen & Hauschild, 2009) These studies also underscore the importance of speech therapy techniques and proved that this disorder may be overcome not only by neurobiological factors but cultural environments, and persistive parental communication strategies. However, these studies cannot be directly applied in country like Pakistan, where there are limited therapeutic consistency, and families preferred to give therapies within home rather than under professionals. Existing literature related to Pakistan is limited due to short follow up period and is insufficient to provide robust outcomes(Rahman et al., 2016). Therefore, this study focused on longitudinal study extended up to fourteen months under the strict and controlled surveillance of professionals. The main aim of the study was to assess the effectiveness of sustained speech therapy over children with ASD. This study could contribute to devising a policy framework at government for the children with ASD and may assist the understanding of global research community for the assessment contextual based impact. This study could also add significance in terms of knowledge that can assist for the improvement of life of children.

Materials and Methods

The present longitudinal study was carried out for fourteen months from the period January 2024 to February 2025. In two reputable institute of Karachi, Pakistan. The name of institute due to their commitment to the researchers is not mentioned in the paper. Both the institutes supported this longitudinal study by permitting access to their client populations and agreed to provide designated therapy space for continuous and close monitoring of children suffering with ASD. These institutes also provided access to consult with Speech language therapists (SLTs), parents and overall administrative staff. The sample for conducting longitudinal study was selected based on clinically confirmed diagnosis of ASD by pediatrician who had practice license and was affiliated with the centers. The study set criterion for the selection of age of children, and children were selected between 4 to 8 years of old and were also registered within those institutes. It was also made sure that these children must be enrolled in Speech therapies programs. The consent of parents was taken in written form. The overall ethical approval, usage of instruments used, and procedures were as per the global standards. Personal Language Scale Fifth Edition (PSL5) was used for baseline. While for assessing receptive and express communication Austrian Treatment Evaluation Checklist (ATEC) assisted in data collection procedure. ATEC was used to capture behavioral and communicational functioning, and well-structured observational checklists were used for the assessment of spontaneous verbal behavior, joint attention episodes, and social communication indicators during their therapy sessions. The instruments used were selected based on their reliability and incremental language changes suitable for children with ASD. The staff were already trained to operate these instruments. The study

followed a multi-stage procedural sequence to track developmental changes across the specified period. First, baseline assessment sessions were conducted on an individual basis for each child. The session lasted for 45 to 60 minutes, during which researchers and institutional clinicians jointly administered PLS-5 and collected observational data. The base for data was from naturalistic play-based interactions. Following this initial stage, children continued their routine therapy at ARC or IBP. Each of them receives two to three sessions per week as per the instruction of clinical recommendations. Therapy procedure followed a structured intervention model rooted in evidence-based practices such as naturalistic developmental behavioral interventions, picture-based communication systems, and phonological shaping techniques. Therapists were instructed to maintain detailed weekly logs to document progress in articulation, functional vocabulary, communicative intent, and nonverbal signaling. Mid-point data were collected at the eight-month mark, repeating the same procedures to ensure comparability of measurements. Researchers also conducted monthly parent interviews to gather contextual data on home-based communication practices, generalization of skills, and possible environmental changes that might influence language development. By the end of the fourteenth month period, a final round of assessments was conducted with the aid of the same instruments and within same observational framework. All datasets baseline, mid-point, and post-intervention were coded and analyzed using mixed-effects modeling to account for individual variability within repeated measures. However, qualitative notes from clinicians were thematically reviewed to identify emerging behavioral patterns. The continuous collaboration of both institutes staff, their assistance in providing assessment materials, and their adaptation of session schedules enabled consistent data collection despite individual differences in children's attendance, yielding a reliable evidence base for evaluating longitudinal study.

Results and Discussion

The 20 participating children with ASD revealed a continuous improvement in all three stages of assessment. This shows that with the help of structured and sustained speech therapy (ST) could provide a good developmental gain in communication. The results shown in table 1 depict the effectiveness of speech therapy in which baseline, midterm and final score records are shown for the 14 months of intervention period (Furrukh & Anjum, 2020). Appearance in an upward trajectory for the participants with the score of baselines averaging in the mid forty (40), with follow-up of steady rise of 10 points by the evaluation of midterm and with an addition of 10 to 12 points in the final assessment can be illustrated in figure 1.

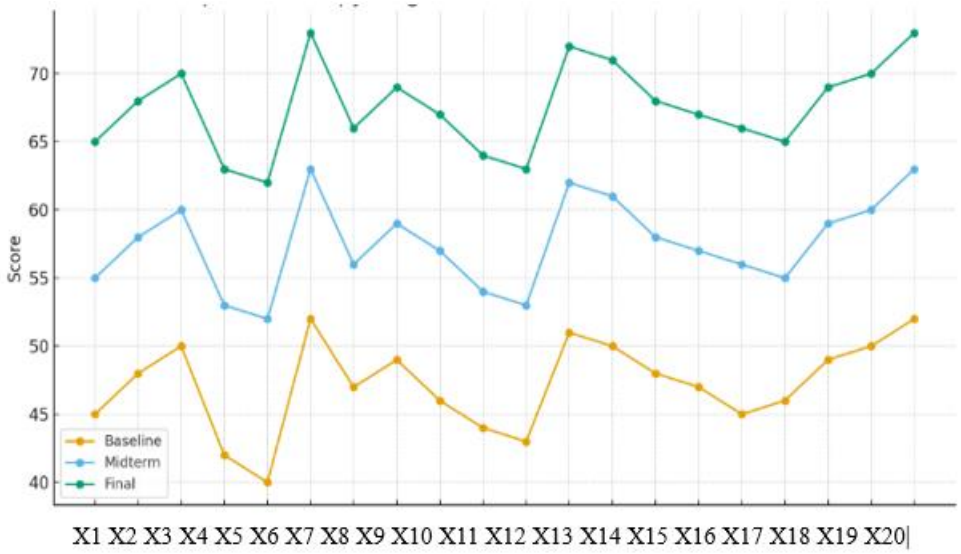

Figure 1 Comparison Between Baseline, Mid And Final Score

This aligned with the result of international empirical findings which indicates that by the aid of ST, shaping and interactive structured intervention could accelerate improvement in disorder (Frazier et al., 2021). In the study, it has also been observed that children with ID X4, X5 and X11 shows steady progression. This again highlights that early deficits do not limit long-term improvement(Abbasi et al., 2025; Ashraf et al., 2022). The progression can be visualized in the figure 1 in which the trajectory for each child was progressing. This uniform growth indicates that therapy framework implemented in this study efficiently targeted pure linguistical domain and have strengthened the vocabulary for expressiveness and receptive comprehension in a proper well-structured and predictable manner (Rahman et al., 2016). effectively targeted core linguistic domains, strengthening both expressive vocabulary and receptive comprehension in a structured, predictable manner.

Table 1: ST Progressive Scores as of Assessment Points

S.No	Child Identity	Score		
		Baseline	**Midterm**	**Final**
1	X1	45	55	65
2	X2	48	58	68
3	X3	50	60	70
4	X4	42	53	63
5	X5	40	52	62
6	X6	52	63	73
7	X7	47	56	66
8	X8	49	59	69
9	X9	46	57	67
10	X10	44	54	64
11	X11	43	53	63
12	X12	51	62	72
13	X13	50	61	71
14	X14	48	58	68
15	X15	47	57	67
16	X16	45	56	66
17	X17	46	55	65
18	X18	49	59	69
19	X19	50	60	70
20	X20	52	63	73

The findings of the study could be implicated in Pakistani Clinics. Consistent and standardized therapies if provided in specialized institutions could successfully address delays in communication amongst children(Furrukh & Anjum, 2020; Khalid et al., 2020). The technical and well-coordinated environment of the institutes could assist in the improvement of children with ASD (Reference). The supportive and well-coordinated environment of the collaborating institutions allowed therapy routines to remain uninterrupted, which likely contributed to the predictability of the observed progress (Johnson et al., 2007; Khalid et al., 2020). This strengthens arguments made in regional studies that long-term therapy, rather than short, fragmented sessions, is essential for meaningful developmental outcomes in (Abbasi et al., 2025; Broome et al., 2023). Despite this need for broader measures, the present results firmly situate the effectiveness of speech therapy within both global evidence and the Pakistani therapeutic landscape, providing a foundation for strengthening intervention practices and institutional support systems across the country.

Conclusion

This is a longitudinal study and presents more focus data at three different points from true cases. However, it has some limitations in terms of generalization. In this longitudinal study twenty children

with four to eight years were selected who were already diagnosed with ASD. There is significant improvement in the communication ability of children when they are properly treated with professionals. The baseline score of each child improved and showed due to effective treatment. Furthermore, it is recommended government must ensure to make effective policy and highlight early ASD children's sufferings and ensure to be treated with great care within public sector hospitals.

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