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ORIGINAL RESEARCH

Evaluating the Effectiveness of Structured Oral Language Therapy on Expressive Language in Preschool Children with Autism Spectrum Disorder

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Background: Autism spectrum disorder (ASD) comprises multiple mental and behavioural variations that mostly appear in early stage of life and effects persistently to all life. Establishing oral language plays an important role in expressive language, with a strong link to understanding reading and writing of ASD children.

Methods: The study employed a quasi-experimental design to assess the impact of structured oral language activities on expressive language skills in ASD children. Nineteen participants, aged 3–5 years, engaged in activities such as mealtime conversations, morning discussions, storybook reading aloud and rhymes over an 8-week period. Pre-testing established baseline measures, and outcomes were assessed through the quantity and quality of expressive language exhibited across these activities.

Results: The highest number of participants were 4 years of age and the majority were male participants (78.9%). The result indicated that the mean ± standard deviation of the pre-test and post-test of expressive language skill was 0.263 ± 0.452 with a p-value of 0.021 ≤ 0.05 level of confidence, with the most significant gains observed in morning conservations ($p = 0.001$) and reading aloud ($p < 0.001$). An increase in both the quantity and complexity of expressive language was observed across all activities. Significant differences can be seen in the amount and type of expressive language in activities related to morning conversation and reading aloud. Children expressed an increase in learning of numbers of words used specifically nouns, verbs and adjectives, with an improvement in the expression of vocabulary.

Conclusion: There was a significant difference in the expressive language of ASD children receiving structured oral language representing facilitation in language development in ASD children.

Keywords: autism spectrum disorder, expressive language, mealtime, morning conversation, oral language, reading aloud, rhymes

Introduction

Autism spectrum disorder (ASD) is a developmental disorder of neurons which affects communication, social relationship as well as the behaviour of the individual. Whereas the subjects with ASD often shows variations in their social interaction and communication, they show capability of social interaction and have tendency of using various forms of language. However, these social interactions and communications with others may differ from those of neurotypical individuals and this may be even more challenging to navigate.[1,2] The main feature of ASD is the impairments in social communication, consisting of difficulties with initiating as well as maintaining conversations, interpreting non-communicable cues along

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with understanding reciprocal interactions.[3] These problems can affect the ability of child to engage in social relationships and this also effects their daily functioning.

The development of language in ASD follows distinct trajectories, and about 30% of the children are minimally verbal even at the school age.[4] The typical patterns are echolalia, pronoun reversal, and especially pragmatic language impaired, and the expressive problems may remain even after receptive skills have emerged, resulting in serious functional communication limitations. These patterns are significantly different than normal typical development and other developmental language disorders and require special intervention strategies.[5] The evidence-based interventions currently in use will often involve: (a) behavioural methods to achieve specific skill acquisitions; (b) naturalistic developmental ones to achieve functional communication; and (c) hybrids of these components.[6–8] Behavioural techniques have been found to be effective in teaching an initial vocabulary but tend to have problems with generalization, and naturalistic ones are much more likely to allow authentic communication but demand extensive support to implement. The oral language structured approach used in this study was particularly aimed at closing these paradigms through enshrining practice in the routine, balancing clinician modelling with child initiation opportunities and, finally, addressing linguistic form and communicative functions. This twofold concern bridges the long-standing generalization gap and answers the current demands of interventions that would benefit both linguistic competence and real social communication needs at the same time.

Communication for ASD individuals can take multiple forms. However, oral language is a very important medium of expression, ASD children may take benefit from alternative and augmentative communication (AAC) systems, like picture exchange, sign language as well as speech generating devices.[9] AAC methods are gaining importance for non-verbal or less verbal individuals. However, for children with mild to moderate ASD who have the potential to develop or enhance their verbal communication, improving oral language remains an important therapeutic target.[6,10]

Oral language includes various important linguistic domains such as phonology, morphology, syntax, semantics, and pragmatics, which results in formation of a foundation for complex language development.[11] These language abilities are necessary for social communication as well as in academic success. Previous research has shown that structured language interventions like Enhanced Milieu Teaching (EMT)[12] and other naturalistic approaches may be helpful to improve expressive language in ASD children by giving opportunities for meaningful language use in day to day activities.[13–16]

Structured oral language activities, like morning conversations, discussions at mealtime, reading loudly and rhymes, bring specific contexts in which children can practise language in interactive as well as in engaging ways. By taking part in these activities, ASD children can strengthen vocabulary, enhance their sentence structures and increase the practical use of functional language in their social settings.[17,18] The well-established structured nature of these interventions implies the provision of clear goals and routines, and gradually helps children in improving their expressive language skills over time.[19,20] In our study, we checked whether activities that involve structured oral activities (such as reading aloud and rhyming) can provide a link between therapeutic settings of speech therapy and ordinary speaking in real life.

Most of the studies suggest that routine-embedded interventions may bridge this gap by leveraging predictable daily activities (eg, mealtimes, dressing) as natural learning opportunities.[21] Such approaches capitalize on intrinsic motivational factors while providing sufficient structure for skill acquisition.[8] However, most studies have been conducted in Western contexts, neglecting cultural variations in communicative routines and implementation barriers in low-resource settings.[22,23] In South Asian cultures for instance, collective family mealtimes may offer unique linguistic scaffolding opportunities that are not discussed much in existing research.[24]

The current study looks at how a language intervention adapted for Pakistani children with ASD was put into practice. Our approach innovates in three key ways: first, it specifically targets expressive language in autism – a critical but understudied predictor of long-term future outcomes. Second, it blends structured clinician modelling skills with natural occurring routine contexts in a novel hybrid protocol. Third, it systematically measures changes in both clinic-based gains and whether those gains are found at home as well which was a weakness of earlier work.[25] We hypothesized that structured oral language activities embedded in culture-focused meaningful routines would greatly enhance expressive language performance while demonstrating superior generalization compared to treatments only at the clinics.

Methodology

Study Design and Population

A quasi-experimental protocol was used for the assessment of impact of structural oral language activates on the expressive language ability of ASD children. The purposive sampling technique was employed for the recruitment of 19 diagnosed ASD children with age between 3–5 years, stratified by age as follows: 3 year olds (n=3, 15.8%), 4 year olds (n=9, 47.4%), and 5 year olds (n=7, 36.8%) were selected to participate and completed the study. Mean age of participants was 2.21±.71 years. While our sample size (n*=19) aligns with similar pilot studies targeting expressive language in ASD,[8,26] we acknowledge its limitations for generalizability. Post-hoc power analysis (G Power, α=0.05, effect size=0.65) indicated 72% power to detect significant differences, suggesting adequate sensitivity for within-group comparisons despite the small sample.[27] In the current study, the majority of the recruited participants were male (78.9%) and females were in the minority (21.1%). Out of 19 diagnosed ASD children, 11 participants represented probable difference in sensory performance and 8 participants had typical sensory performance.

A total of 19 children with age ranged from 3 to 5 years who were diagnosed with mild to moderate ASD were enrolled in this study by using a purposive sampling technique. This study was conducted in special needs centres and outpatient departments (OPD) of tertiary care hospitals. The clinical evaluations and diagnosis of ASD was carried out by DSM-5 criteria.[28] The intervention sessions were conducted in a soundproof treatment room measuring 3×3 m^2, equipped with a child-sized table and chairs. Wall-mounted visual schedules were prominently displayed at eye level to support activity transitions. These settings maintained standardized conditions with: (a) ambient lighting between 300 and 500 lux (measured by digital light meter); (b) background noise levels below 50 dB; and (c) controlled temperature (20–23 °C) to ensure participant comfort. Children having other coexisting diseases like epilepsy, seizures or other serious cognitive diseases were not included in current study.

Controlling for Age and Developmental Differences

As we are familiar with the fact of developmental variability among children of this age group, the participants were categorized into three different age categories: 3 years, 4 years, and 5 years. This division helped us in analysis within each age group, resulting to assess variations in language development within these ages. Baseline assessments of cognitive and language skills were noticed before giving the intervention in order to cater the control for developmental variations.[5]

Control for Home Environment and Other Interventions

Three Certified speech-language pathologists with more than 5 years of ASD experience delivered interventions after: (a) an 8-hour workshop on protocol standardization; (b) fidelity certification (≥90% on mock sessions); and (c) monthly booster trainings (adherence ratings: mean=93.2%, SD=3.1). In order to maintain uniformity all sessions were conducted in a constant environment of special needs centres and OPDs, thereby eliminating the chance of variability that could have arisen from different home environments for ASD children. Parents were provided with proper guidelines about not to introduce any sort of additional language or any new speech interventions during the study span and parents were also instructed for regular follow-ups to monitor compliance. Children who were receiving any other language interventions were not allowed to take part in this study project from participation to check the impacts of the structured oral language intervention.

Participant Characteristics: Controlling for Age, IQ, ASD Severity and Receptive Language

Only children with confirmed diagnosis of mild to moderate ASD were enrolled in this study and children with a minimum of Level 1 Information Carrying Words (ICW) matching skills were selected to ensure collection of baseline data of receptive language abilities.[4,29] The cognitive functioning levels of participants in this study were characterized using existing clinical documentation, including Vineland Adaptive Behaviour Scales (VABS-II) scores from medical records as standardized indicators of adaptive functioning. While formal IQ testing was not conducted as part of the study

protocol, all participants had well-documented ASD diagnoses with severity levels clearly specified according to DSM-5 criteria in their clinical reports. This approach allowed for consistent characterization of both cognitive profiles and ASD severity while reflecting real-world clinical practice where comprehensive neuropsychological assessments may not always be available prior to intervention planning. The use of these established clinical measures ensured that participant selection and baseline characterization maintained methodological rigour despite the absence of study-specific cognitive testing. Children with mild to moderate ASD who were capable of verbal communication were the prime focus while the children with severe ASD or cognitive impairments were excluded to reduce confounding effects.

All of the pre-school participating children's receptive language levels were monitored by using the Language Checklist ensuring that all participating children had the ability to rule out simple given instructions. This criterion was assumed to be very necessary for engaging in the structured language activities of the intervention plan.[3,9]

Intervention Protocol

An 8-week structured oral language intervention was given, with engaging the participants in various activities like morning conversations, mealtime discussions, reading aloud, and rhymes as shown in the Intervention Protocol Flowchart (Supplementary Figure 1). Table 1 shows the intervention plan and activities of oral language for 8 weeks. There were three sessions per week that lasted for 30 minutes per session. Oral Language activity session comprised 5 minutes of morning conversation, 10 minutes of rhymes, 10 minutes of reading aloud activity and 5 minutes of meal time. The intervention aimed to: (a) increase verbal output frequency (≥5 novel words/session); (b) expand vocabulary diversity (nouns → verbs → adjectives); and (c) improve functional use in routine contexts (eg, requesting during mealtime). These targets were derived from DSM-5 communication deficits in ASD[30] and aligned with WHO early intervention priorities (2023).[31] There were 10 learning episodes targeted during each individual session by speech language pathologists by adapting different techniques like modelling, prompting and positive reinforcement.[6]

Data Collection, Transcription and Scoring

The participants of the study were assessed after the intervention for quantity and complexity of Expressive Language. Written consent has been sought from the special needs centres and hospital Out Patient Department (OPD) for data collection. The flow chart of participants through different phases of complete experimental study is given in Figure 1. The whole data on expressive language per session were collected by the audio recordings during intervention sessions. Then these recordings were transcribed for the amount and type of language used by participants. Two independent raters who were blind to the study conditions were recruited, and they transcribed and scored the recordings. 90% Inter-rater reliability was determined to ensure the precision and accuracy of expressive language transcriptions and coding.[11,14,15]

Table 1 Intervention Plan: Activities of Oral Language for 8 Weeks

Activity	Protocol Steps	Fidelity Checks
Morning Conversation	1. Greetings: Saying good morning, Assalam-o-Alikum, hello/hi 2. Ask "What will you do today?" and model 2-word responses ("Eat breakfast") 3. Give token + praise for all verbal attempts	• Weekly audio review of first 5 prompts • Checklist: ≥3 tokens given per session
Reading Aloud	1. Point to and name pictures ("I see a dog") 2. Pause at predictable words ("The cat says.") 3. Expand child's words ("Car!" → "Red car!")	• 5+ opportunities per book page • Record 1 expansion per minute
Mealtime Discussion	1. Name foods with gestures ("This is milk, rice, roti. Kabab") 2. Ask feature questions ("Is it hot/cold?") 3. Model requests ("Say 'I want juice'")	• Present all 3 food items • Track wait time (3–5 sec before prompting)
Rhymes	1. Sing line-by-line with motions 2. Pause before rhyming words ("Twinkle twinkle little.") 3. Accept any rhyming attempt ("star/mar")	• Complete all 3 verses • Note 2+ child participations per rhyme

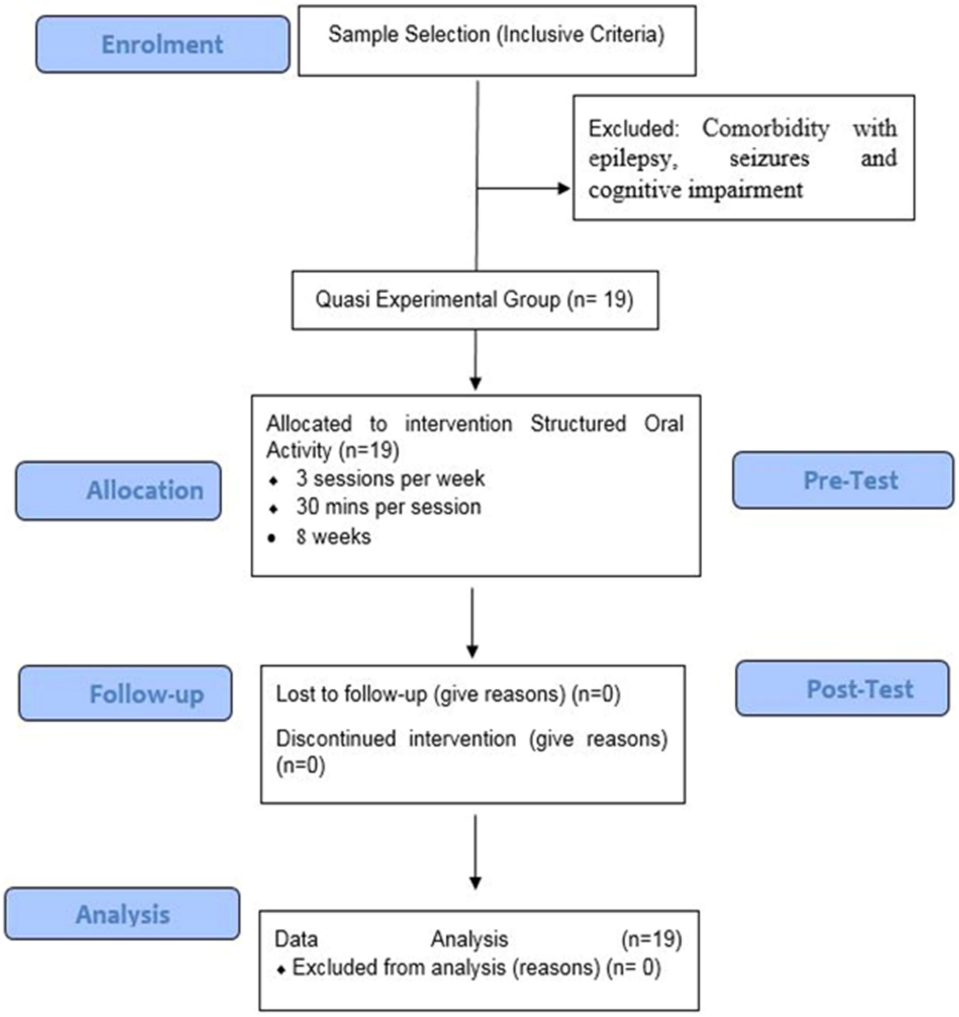

Figure 1 Flow diagram showing the progress of different phases of the study.

Ethical Considerations

The ethical approval of the study has been obtained from the Institutional Review Board of Riphah International University, Islamabad, Pakistan. The study was performed between April 2021 and February 2023. All the procedures containing human participants were conducted based on the Helsinki Declaration.[32] Parents of children were given informed consent for audio recordings and data sharing related to the study and ensure all rights of the participants were protected. The aims of the study, length and commitment required for the study were explained to parents. Each and every effort was carried out to make sure to volunteer the participation and the children were away from undue stress or any sort of discomfort.

Data Analysis

The analysis of the data collected was done using SPSS 21. The computed results consisted of the inferential analysis of the variables and their descriptive analysis. Descriptive statistical analysis may constitute percentages, frequencies and cross-tabulations of different variables used in study. Paired-sample *t*-tests with *p*-value set at the 0.05 level were selected for their robustness in detecting changes in small samples with paired measurements. Effect sizes (Cohen's d) were calculated to complement *p*-values.

Table 2 Cross-Tabulation of Age with Pre and Post-Test Expressive Language Skills

Age Group	Pre-Test (Expressive Functional Skills)	Post-Test (Expressive Functional Skills)
3 years	1 (Yes), 2 (Sometimes)	3 (Yes)
4 years	8 (Yes), 1 (Sometimes)	9 (Yes)
5 years	5 (Yes), 2 (Sometimes)	7 (Yes)
Total	14 (Yes), 5 (Sometimes)	19 (Yes)

Results

Expressive Language Outcomes

The results of Pre-test Expressive language skill demonstrated that 14 ASD children had expressive language skill and 5 ASD children sometimes showed expressive language skills. Out of 3 children of 3 years of age, 2 children sometimes showed expressive language skills on pre-testing. One out of 9 children with Autism of 4 years of age and 2 out of 7 children of 5 years of age sometimes showed expressive language skills on pre-testing. However, the result of post-test expressive language skill showed that all 19 children had expressive language skills after receiving structured oral language therapy as shown in Table 2.

Significant differences can be seen in the quantity and complexity of expressive language in morning conversation as shown in Figures 2 and 3. No change has been observed in the kind of expressive language in the participants aged 3 years in rhymes, whereas change in the kind of expressive language of 1 participant aged 4 years and 1 participant aged 5 years is given in Supplementary Figures 2 and 3. Eight weeks intervention of reading aloud activity proved very effective for participants as there was significant change in quantity and complexity of expressive language of children (Supplementary Figures 4 and 5). Results showed significant differences in quantity and complexity of expressive language in autistic children (Supplementary Figures 6 and 7). The results of cross-tabulations demonstrated that there was a significant difference found in the amount as well as kind of expressive language in morning conversation, during rhymes, in reading aloud and at mealtime.

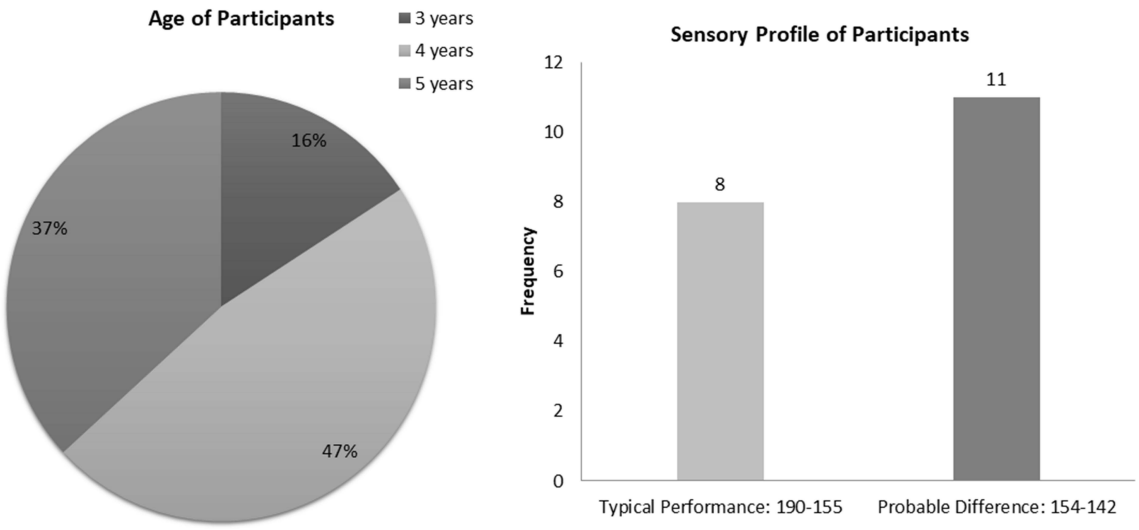

Figure 2 Bar graph representing frequency of age with pre-test and post-test amount of expressive language in morning conversation.

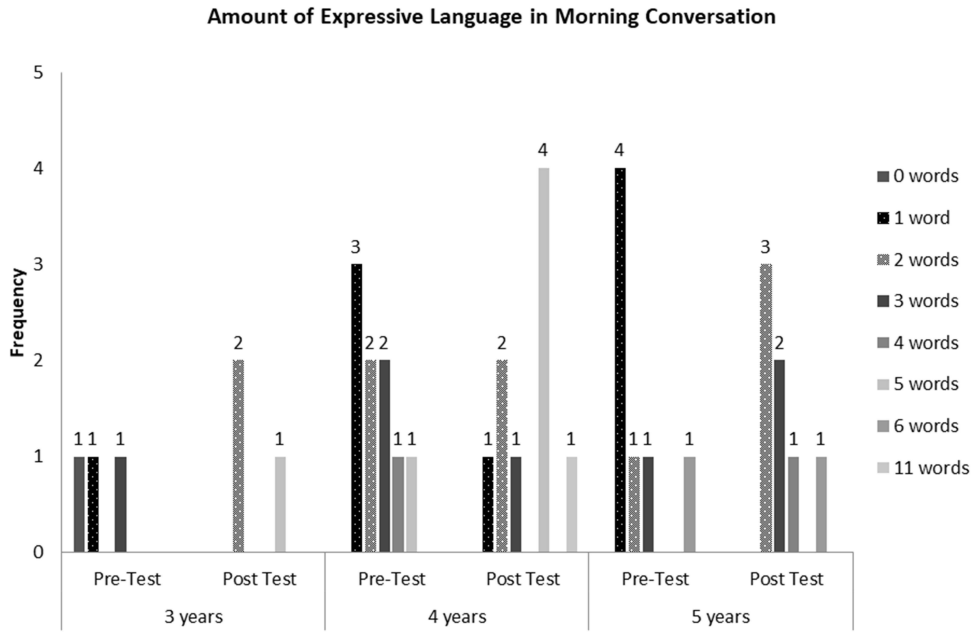

Figure 3 Bar graph representing frequency of age with pre-test and post-test kind of expressive language in morning conversation.

Statistical Analysis of Pre- and Post-Test Differences

The result of the paired-sample *t*-test showed that the mean ± standard deviation of pre-test was 1.263 ± 0.452 and the post-test of expressive language skill was 1.00 ± 0.00 with a *p*-value 0.021 ≤ 0.05 level of confidence. The result also demonstrated that there was a significant difference in the amount of expressive language of ASD children in morning conversation (0.001 ≤ 0.05), reading aloud (0.000 ≤ 0.05), rhyme (0.000 ≤ 0.05) and at mealtime (0.000 ≤ 0.05), as indicated in Table 3. Paired-sample *t*-test showed significant pre and post difference in structured oral language activities.

Generalization of Results

Individuals with ASD often struggle to generalize learned skills to untrained situations. While the structured oral language activities in this study were effective in improving expressive language within specific contexts (eg, morning conversations, reading aloud), it remains unclear whether these skills would generalize to other, untrained environments. This limitation should be addressed in future studies by testing expressive language skills in a variety of settings and through parent-mediated interventions to promote generalization.

Table 3 Paired-Sample *t*-Test Results for Pre-Test and Post-Test of Expressive Language Skill

Measure	Pre-Test Mean ± SD	Post-Test Mean ± SD	p-value	Cohen's d	Interpretation
Language Checklist: Expressive Functional Skills	1.263 ± 0.452	1.000 ± 0.000	0.021	0.78	Large effect
Morning Conversation	2.158 ± 1.573	3.684 ± 2.311	0.001	0.76	Large effect
Reading Aloud	1.632 ± 0.895	4.316 ± 1.887	0.000	1.78	Very large effect
Rhymes	1.947 ± 1.268	3.789 ± 2.016	0.000	1.06	Large effect
Mealtime	3.579 ± 2.268	7.053 ± 2.635	0.000	1.42	Very large effect

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Discussion

This study aimed to assess the impact of structured oral language activities on the expressive language skills of ASD children. The results showed that ASD children significantly improved both in the amount as well as in type of expressive language used across different structured activities, specifically in morning conversations, mealtime discussions, reading aloud and rhymes. These findings are consistent with previous studies that may also suggest that structured interventions can effectively improve language development in ASD children.[6,33]

The significant enhancement in expressive language found in current study highlights that structured oral language activities provide an impact full framework for language acquisition in ASD children. More and more use of nouns, verbs and other complex word types such as prepositions and use of adjectives post intervention supports the notion that this may provide children with a predictable and repetitive structure which not only allows them to practice but also refine the language skills of ASD children.[4] These findings are consistent with earlier research that express structured interventions, like Enhanced Milieu Teaching (EMT)[34] as well as some other naturalistic approaches, which are considered to be more impactful in enhancing language development in children having developmental delays.[13–15]

Additionally, the age-related enhancements observed in this study where the younger age group children (aged 3 years) showed gains in basic word usage and the older age group children (aged 4–5 years) demonstrated much advancement in language skills are consistent with developmental language trajectories. This research also suggests that structured interventions can be helpful for children in building the foundational language skills that may later on support more complex linguistic development.[20,35,36]

The most important challenge in interventions for ASD children is the ability to generalize learned skills to untrained settings. Whereas this study represented significant enhancements among structured activities, it did not directly examine whether these expressive language skills transferred to more naturalistic or unstructured environments, like spontaneous conversations at home or during school sessions. This limitation is consistent with earlier studies which highlight that generalization is more often much difficult for ASD individuals.[37] Therefore, future research should tackle this issue while incorporating parent-mediated interventions or by examining the skill transfer across multiple settings, as this could be make sure that language improvements are even not only maintained but also applied outside of structured sessions.[26]

The findings of the current study are comparable to earlier results documented in autism intervention research. For instance, Guralnick et al[18] addressed in their study that structured peer-related social activities enhanced the communication within children having developmental delays, which is aligned with the language gains reported in structured oral language activities of his study. At the same time, other research on structured and naturalistic interventions, like those by Kaiser & Hancock[15] and Kasari et al,[38,39] have suggested that creating personalized opportunities for language practice within day to day contexts improves expressive language outcomes in ASD children.

However, while many studies focus on receptive language development, this study specifically targeted expressive language, which remains a relatively under-explored area in ASD research. The results suggest that structured interventions may be particularly useful in fostering expressive language, complementing findings from studies that emphasize receptive language interventions.[20,40]

To our knowledge, this is the first study to demonstrate the efficacy of routine-based oral language activities (eg, mealtime discussions) in a South Asian context, where family-centric communication patterns differ markedly from Western settings.[41] The intervention's success with Urdu-speaking children suggests cultural validity for embedding language practice in communal activities like shared meals. Unlike clinic-dependent therapies, our structured activities require no specialized materials, making them scalable for low-resource schools and homes a critical need in Global South regions.[42] The differential gains across activities (strongest for reading aloud, $p < 0.001$) provide new evidence that narrative contexts may uniquely scaffold syntax development in ASD, complementing existing focus on vocabulary as per Cronin in 2014.[20] While our core findings align with established principles of structured intervention described by Schreibman et al in 2015,[6] the cultural adaptation and activity-specific effects extend current paradigms to underserved populations.

The results from the current study have critical implications for clinical practice as well as educational settings. Speech language pathologists along with educators can integrate structured oral language tasks such as reading aloud,

mealtime discussions, and morning conversations within their therapy sessions to enhance expressive language development in ASD children. These activities provide a clear structure that favours children and is productive in practicing specific language skills in a focused and supportive environment.

Moreover, parents training should also be important to use these structured activities at home, which could further strengthen language acquisition and increase the likelihood of generalization. When parents get involved in the intervention process, the ASD children could receive consistent language practice across multiple contexts, which promotes the transfer of learned skills to everyday life.[43]

Although these are some promising findings, there are multiple limitations to this study. Firstly, the low number of sample size (n=19) limits the generalizability of the results. Large-scale research with more diversified participants is required to ensure the effectiveness of structured oral language activities for ASD children across numerous populations. Secondly, the absence of a control group in the current study also prevents a direct comparative analysis with children receiving traditional therapy or no therapy at all. The absence of a control group limits causal inferences; however, this design choice was intentional to prioritize ecological validity. Given resource constraints in clinical settings where this intervention is targeted, we focused on demonstrating feasibility and effect sizes to inform future RCTs. Prior quasi-experimental studies in low-resource contexts for, eg, Rojas-Torres et al, [41] have similarly used pre/post designs as a preliminary step. Furthermore, studies should must include a control group for better understanding of the effects of the structured intervention.[26,41]

Another limitation is the short duration of the intervention that is just 8 weeks, which may not have been sufficient time to fully capture the long-term effect of structured language activities. Similarly, follow-up assessments are also required to assess whether the observed language improvements are retained with time and whether they are generalizing to untrained settings. Future research studies are needed to explore how to incorporating naturalistic settings into the intervention, specifically involving ASD children family members or peers, which may improve the generalization of language skills.

Conclusion

This study demonstrates that structured oral language interventions such as morning conversations, mealtime discussions, reading aloud and rhymes are greatly beneficial in enhancing the expressive language skills among preschool children with mild to moderate ASD, especially in the areas of vocabulary diversity and functional communication. Although the findings are encouraging in indicating that such inexpensive, routine-driven interventions should be incorporated into clinical and teaching environments, the absence of long-term follow-up and a control group requires the findings to be interpreted with caution. The most effective way to translate this into the real world in the future is to investigate scalable implementation models, which may include special education teacher training to incorporate these activities into everyday classroom routine or the creation of parent-guided home programmes. These results may be used by policymakers and clinicians to promote the organized language interventions within the individualized education plans in the resource-constrained settings as the sustainable and readily available therapies are extremely required.

Data Sharing Statement

All reported data are available in the Results sections and tables.

Consent for Publication

All the authors agreed to publication.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors affirm that there are no conflicts of interest to disclose for this work.

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