Archives of Current Medical Research
Arch Curr Med Res 2026; 7(2): 455-470

Received: 12 June 2025
Revised: 20 September 2025
Accepted: 20 November 2025
DOI: 10.47482/acmr.1718645

ORIGINAL ARTICLE

Externalizing Symptoms, Parent–Child Relationship, and Psychiatric Comorbidities in Preschoolers with Language Disorder: Predictors of Parenting Stress

Hande Günal Okumuş[1] **Makbule Esen Öksüzoğlu**[2] **Rahime Duygu Temeltürk**[3,4,5]

1 Uşak Training and Research Hospital, Department of Child and Adolescent Psychiatry, Uşak, Türkiye.
2 Kastamonu University, Faculty of Medicine, Department of Child and Adolescent Psychiatry, Kastamonu, Türkiye.
3 Ankara University, Faculty of Medicine, Department of Child and Adolescent Psychiatry, Ankara, Türkiye.
4 Ankara University, Institute of Health Sciences, Department of Neuroscience, Ankara, Türkiye.
5 Ankara University Autism Intervention and Research Center, Ankara, Türkiye.

Abstract

Background: This study aimed to compare externalizing behaviors, parenting stress, and the quality of the parent–child relationship in children with language disorder (LD) and typically developing peers; to identify psychiatric comorbidities, and to assess predictors of parenting stress in children with LD.

Methods: The study included 120 children aged 24 to 60 months and their caregiver(s). Parents completed the Aberrant Behavior Checklist (ABC), the Parenting Stress Index-Short Form (PSI-SF), and the Child–Parent Relationship Scale (C-PRS). Sociodemographic and clinical information was obtained through face-to-face interviews with caregiver(s). Diagnoses of LD and comorbid psychiatric disorders were based on DSM-5 criteria.

Results: Children in the LD group showed delays in first words ($p < 0.001$) and first sentences ($p < 0.001$). Controlling for parental education, they had higher ABC scores ($p = .001$), especially Irritability ($p = 0.002$) and Hyperactivity ($p < 0.001$). CPRS scores were also elevated ($p < 0.001$) with greater conflict ($p = 0.001$), and parents reported higher PSI scores ($p < 0.001$), particularly in Parent–Child Dysfunctional Interaction ($p < 0.001$) and Difficult Child ($p = 0.001$).

Conclusion: These findings suggest that LD should be conceptualized as part of a broader developmental profile with significant behavioral and parental implications, rather than solely as a language impairment. Early, multidimensional interventions targeting child externalizing problems—particularly irritability—as well as parenting stress and the parent–child relationship are essential.

Keywords: Language disorder; parenting stress; irritability; parent-child relationship; psychiatric comorbidity.

Corresponding Author:
Hande Günal Okumuş, MD
Uşak Training and Research Hospital, Department of Child and Adolescent Psychiatry, Uşak, Türkiye
E-mail: drhandegunal @gmail.com

INTRODUCTION

Language Disorder (LD) is an early childhood-onset neurodevelopmental disorder characterized by significant impairments in the acquisition and/or use of language, in the absence of identifiable neurological or organic condition (1). Although expressive language skills are most frequently affected in children with LD, impairments may also occur in receptive, pragmatic, and syntactic domains. These deficits vary in severity and form across individuals, contributing to the considerable heterogeneity in symptom presentation (2). Early language delays are relatively common, with 11–18% of toddlers experiencing delayed language development; these children are often referred to as "late talkers." (2). However, the prevalence of LD has been estimated at approximately 7% (3,4). LD can significantly affect not only language development but also a child's socio-emotional development and academic functioning. Research has shown that children with LD often experience learning difficulties and short-term memory deficits, which may persist into adulthood (5). In addition to neurocognitive sequelae, increased levels of behavioral problems, social adaptation difficulties, and psychiatric symptoms have also been reported in this group (6,7).

Several studies have demonstrated that children with LD exhibit higher levels of behavioral problems compared to their typically developing (TD) peers (6). A comprehensive meta-analysis examining both internalizing and externalizing symptoms in children with LD and specific learning disorders (SLD) found that, although internalizing problems, such as anxiety, depression, and social withdrawal, were particularly prominent in children with LD, externalizing problems, such as conduct problems, hyperactivity, and aggression, were also significantly elevated (8). Notably, the increase in externalizing problems was consistently reported by different informants, including parents, teachers, and the children themselves, highlighting how reliably and visibly these behaviors emerge in children with LD, particularly in contrast to the more subtle and often underreported nature of internalizing symptoms (8). Language competence has been shown to be a key factor in the development of later externalizing behaviors, particularly those involving aggression (9). Given the rapid detectability and disruptive nature of these behaviors—including their adverse effects on academic performance, social functioning, and broader developmental outcomes—special attention should be given to these symptoms in children with LD (10).

Parenting stress refers to the negative psychological responses that occur when a parent perceives an imbalance between the demands of parenting and their own perceived resources (11). According to Abidin's transactional model of parenting behaviors, parenting stress emerges from the dynamic interaction between parental characteristics, child-related developmental and behavioral features, and environmental/situational factors (12). While parenting always involves a certain level of stress, raising a child with a psychiatric disorder can increase this burden, making it more persistent and complex. Consistent with this, previous studies have shown that parents of children with neurodevelopmental disorders report significantly higher levels of parenting stress compared to parents of TD children (13,14). In the context of LD, the relationship between parenting stress and a child's language development appears to be bidirectional. While delays in language acquisition may represent a significant source of stress for parents (15)—as language difficulties are often among the earliest and most observable developmental concerns—elevated parenting stress, in turn, may contribute to dysfunctional parent-child interactions and diminish the frequency, richness, or quality of language input (16). In addition, one meta-analysis found that child externalizing behaviors, in particular conduct problems, are among the strongest predictors of parenting stress in children with attention deficit hyperactivity disorder (ADHD) (17). As externalizing symptoms are also commonly reported in children with LD, examining parenting stress specifically in the context of LD remains important, given the developmental needs of these children.

Alongside externalizing behaviors and parenting stress, the parent-child relationship is widely recognized as a domain that plays a crucial role in shaping children's language development. Factors such as parents' responsiveness to the child's communication attempts, the sufficient duration and quality of interaction, and the provision of rich and meaningful linguistic input are closely associated with language development. In addition, the use of development-supporting strategies, including modeling and enhancing joint attention, plays a crucial role within the context of parent–child interaction (18,19). A study involving video-recorded structured and unstructured home sessions with 20 parent-child

dyads, including children with LD and their TD peers, found that parents in the LD group used fewer total words, produced shorter sentences, and participated in turn-taking less frequently across both sessions (20). Another study also found that in TD children, language maturity was significantly associated with maternal verbal and nonverbal interaction patterns, including expansions, questions, responses, acknowledgements, and the use of gestures. However, these associations were markedly attenuated in children with LD (21). However, a meta-analysis examining parent–child interactions between children with LD and their TD peers found that the number of studies addressing this issue was limited and that the evidence for significant differences between the two groups was inconclusive (22). Further research on parent–child relationships in children with LD is warranted, given the limited and inconsistent findings in the current literature. Such studies are valuable for identifying relevant risk factors and for informing the development of individualized therapeutic approaches, including parental support and psychoeducation programmes.

Children with LD have high rates of psychiatric comorbidity, with a particularly strong overlap with neurodevelopmental disorders in early childhood. A recent systematic review identified ADHD as the most commonly co-occurring neurodevelopmental disorder in this population (23). Consistent with this finding, a large-scale study comparing 5,273 children with LD to 26,353 healthy controls, using an automated phenotyping algorithm based on electronic health records, found that the most frequently observed psychiatric comorbidities in children with LD were SLD, ADHD, conduct disorders, and motor coordination problems (24). Evidence suggests that the high comorbidity between LD and ADHD arises from overlapping neurodevelopmental mechanisms. Deficits in executive functioning, along with working memory impairments have been consistently associated with language-related difficulties. These language-related difficulties include disorganized speech, inappropriate or out-of-context word use, excessive talking, and reduced narrative coherence (23, 25). In addition, phonological processing, a core component of structural language acquisition, appears particularly vulnerable to inattention (26). Impairments in this domain may lead to slower lexical acquisition, limited vocabulary growth, phoneme production errors, and disruptions in syntactic organization, thereby compromising multiple aspects of language development (27). Current research also shows that the psychiatric burden associated with LD is not limited to the early developmental period but often extends into adolescence and early adulthood. In a 14-year longitudinal study investigating the long-term psychiatric outcomes of children with LD at age 5, participants were reevaluated at multiple time points. By age 19, social anxiety disorder was found to be common, while antisocial personality disorder was significantly more prevalent in male participants compared to controls (28). As the negative consequences of psychiatric comorbidities on the clinical course and treatment response are well documented, the early recognition of psychiatric conditions and the development of targeted intervention programmes are essential.

Building upon the findings presented, the primary aim of this study was to compare children with LD and their TD peers in terms of externalizing behaviors, parenting stress, and the quality of the parent–child relationship. A secondary aim was to identify the types and relative frequencies of psychiatric comorbidities in children with LD. Additionally, we sought to identify predictors of parenting stress. Our main hypotheses were as follows: (1) children with LD would exhibit higher levels of externalizing behaviors and parenting stress, as well as a poorer quality of parent–child interaction compared to their TD peers; (2) Externalizing behaviors would emerge as a strong predictor of parenting stress in parents of children with LD and; (3) children with LD would have higher rates of psychiatric comorbidities, with ADHD being the most common comorbid diagnosis.

MATERIALS AND METHODS

Participants and Procedure

The study sample consisted of 120 children and their primary caregivers. Sixty children with LD were recruited from the Child and Adolescent Psychiatry outpatient clinics of Uşak Training and Research Hospital and Kastamonu Training and Research Hospital between January 2, 2025, and June 2, 2025, following referrals due to concerns about language development. The diagnosis of LD and any comorbid psychiatric conditions was established based on DSM-5 diagnostic criteria, a comprehensive developmental history provided by the caregiver(s), and clinical observation. Children were eligible for inclu-

sion in the LD group if they met the following criteria: (1) age between 24 and 60 months; (2) a current diagnosis of LD based on DSM-5 criteria; (3) the presence of at least one primary caregiver (preferably a biological parent) who could participate in the study; and (4) provision of informed consent. Children with autism spectrum disorder, global developmental delay, selective mutism, or any chronic medical condition were excluded.

The remaining 60 children comprised the healthy control (HC) group and were matched with the LD group by age and gender. They were recruited from the General Pediatrics Clinics of the same hospitals among children presenting with minor acute conditions such as the common cold or abdominal pain. Parents were excluded if they were illiterate, unwilling to participate, or had a documented diagnosis of intellectual disability or psychotic disorder.

All parents completed the Aberrant Behavior Checklist (ABC), Parenting Stress Index-Short Form (PSI-SF), and Child-Parent Relationship Scale (C-PRS). Researchers completed the sociodemographic and clinical data form through face-to-face interviews with the caregiver(s).

Measurements

The sociodemographic and clinical data form was developed by the researchers to provide a comprehensive profile of both the children and their families. It includes detailed information on sociodemographic background, the children's medical and psychiatric history, the families' medical and psychiatric history, as well as prenatal, perinatal, and postnatal periods.

The Aberrant Behavior Checklist (ABC) is a 58-item caregiver-reported scale originally developed by Aman and colleagues to assess behavioral problems in children (29). It includes five subscales: lethargy/social withdrawal, irritability, stereotypic behavior, inappropriate speech, and hyperactivity. Items are rated on a scale from 0 ("not a problem at all") to 3 ("a severe problem"), reflecting symptom severity. A reliability and validity study of the Turkish version of the ABC was conducted in a preschool population, demonstrating acceptable psychometric properties (30).

The Parenting Stress Index-Short Form (PSI-SF), originally developed by Abidin (12), is designed to measure the intensity of stress experienced by parents in their caregiving roles. The short form comprises 36 items and includes three subscales: parental distress, parent-child dysfunctional interaction, and difficult child. Items are rated on a 5-point Likert scale, with total scores ranging from 36 to 180. Although there is no established cut-off value, higher scores indicate greater levels of parenting stress. The reliability and validity study of the Turkish version was established by Mert et al. in 2008 (31).

The Child-Parent Relationship Scale (C-PRS), originally developed by Pianta (32), is a parent-reported instrument used to assess the quality of dyadic interactions between parent and child. The original C-PRS comprises 30 items and includes three subscales: conflict, dependence, and positive aspects of relationships (closeness). Items are rated on a 5-point Likert scale ranging from 1 (definitely does not apply) to 5 (definitely applies), and the scale includes reverse-coded items. Although there is no established cut-off value, higher scores indicate greater difficulties in the parent–child relationship. The reliability and validity study of the Turkish version was conducted by Akgün and Yeşilyaprak. The dependence subscale, which showed low internal consistency in the original version, was not included in the Turkish version (33).

Statistical Analysis

Power analysis was conducted using the G*Power 3.1.9.4 program. Based on a study published in 2016 that compared the PSI scores of mothers of children with neurodevelopmental disorders and typically developing children (TD), the mean Cohen's d across all PSI subscales for mothers in the LD and TD groups was calculated as 1.87 (13). Assuming a statistical power of $\beta = 0.95$ and a significance level of $\alpha = 0.05$, the required sample size for comparing the LD and TD groups was estimated to be approximately seven participants per group.

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version [26.0]. Descriptive statistics were calculated for demographic and clinical characteristics. Categorical variables were presented as frequencies and percentages, and continuous variables were expressed as medians with interquartile ranges (IQR) and means with standard deviations.

Categorical variables were compared using the Chi-square test or Fisher's exact test, where appropriate. Normality tests (e.g., Kolmogorov–Smirnov test) indicated that continuous variables deviated from a normal distribution; therefore, nonparametric methods

(Mann-Whitney U and Spearman Correlation) were used. In addition, to control for potential confounding effects of parental education, analysis of covariance (ANCOVA) was performed for the ABC, CPRS, and PSI scores, with maternal and paternal education levels entered as covariates. The effect sizes of continuous variables with statistically significant differences between groups were calculated using Cohen's d values, which were computed using means and standard deviations to quantify the magnitude of differences, with thresholds for small ($d < 0.2$), medium ($d < 0.5$), and large effects ($d \geq 0.8$). For ANCOVA analyses, effect sizes were also reported as partial η^2, with values of 0.01, 0.06, and 0.14 interpreted as small, medium, and large, respectively. These complementary effect size measures provided a more comprehensive understanding of the differences observed between groups.

In the LD group, Spearman's rank-order correlation analyses were conducted to examine associations among the subscales of the ABC, C-PRS, and PSI-SF. Correlation coefficients (rs) and corresponding p-values were computed, with effect sizes interpreted as small ($rs < 0.30$), medium ($rs = 0.30–0.50$), or large ($rs \geq 0.50$). Additionally, within the LT group, a stepwise linear regression analysis was performed to identify predictors of PSI-SF Total from the ABC subscales. The initial model included ABC-Irritability, ABC-Hyperactivity, ABC-Speech, ABC-Lethargy, and ABC-Stereotypic Behavior; however, only ABC-Irritability remained in the final model. For this regression, unstandardized coefficients (B), standard errors (SE), standardized coefficients (β), t statistics, and 95% confidence intervals were calculated. The model fit was evaluated using R^2 and adjusted R^2, with overall significance assessed via the F statistic ($p < 0.05$). Results were considered statistically significant at a p-value < 0.05.

RESULTS

Sociodemographic characteristics of the LD group and the HC group were compared (see Table 1). The groups did not significantly differ in terms of age, gender, parental age, number of siblings, family structure, or sibling characteristics ($p > 0.05$ for all comparisons). However, mothers in the HC group had significantly more years of education than those in the LD group ($M = 14.7$, $SD = 2.7$ vs. $M = 11.0$, $SD = 3.8$), $U = 847.0$, $z = -5.467$, $p < 0.001$. Similarly, fathers of children in the HC group had significantly higher educational attainment than those in the LT group ($M = 14.6$, $SD = 2.6$ vs. $M = 12.8$, $SD = 3.7$), $U = 1283.5$, $z = -2.946$, $p = 0.003$. A significant difference also emerged in the presence of a family history of late talking, which was more prevalent among children in the LD group (60.0%) than the HC group (11.7%), $\chi^2(1) = 30.480$, $p < 0.001$. No other sociodemographic or familial variables, including socioeconomic status, bilingualism, parental medical or psychiatric conditions, or sibling education levels, were found to significantly differ between the two groups.

A comparison of developmental milestones between the LD and HC revealed several statistically significant differences (see Table 2). Children in the LD group exhibited delayed onset of independent walking compared to HC counterparts ($M = 13.4$, $SD = 2.8$ vs. $M = 12.0$, $SD = 1.5$), $U = 1233.5$, $z = -2.801$, $p = 0.005$. Moreover, the LD group exhibited significantly delayed onset of both first words ($M = 15.7$, $SD = 4.5$ vs. $M = 10.6$, $SD = 3.3$), $U = 530.0$, $z = -6.491$, $p < 0.001$, and first sentences ($M = 27.1$, $SD = 6.8$ vs. $M = 19.2$, $SD = 4.5$), $U = 33.5$, $z = -5.319$, $p < 0.001$. Additionally, toilet training occurred later among LD children compared to HC peers ($M = 32.0$, $SD = 7.0$ vs. $M = 28.6$, $SD = 4.9$), $U = 539.5$, $z = -2.498$, $p = 0.012$. In contrast, no significant differences were observed between groups in terms of age at head control ($p = 0.447$) or independent sitting ($p = 0.367$).

Significant group differences emerged across multiple dimensions of the ABC, CPRS, and PSI-SF after controlling for parental education levels (see Table 3). Children in the LD group exhibited significantly higher total ABC scores than HC ($M = 28.6$, $SD = 25.1$ vs. $M = 11.8$, $SD = 11.2$), $F(1,116) = 11.79$, $p = 0.001$, partial $\eta^2 = 0.092$, indicating more behavioral problems. Specifically, the LD group scored significantly higher on the Irritability ($p = 0.002$), Stereotyped Behavior ($p = 0.024$), and Hyperactivity ($p < 0.001$) subscales, whereas group differences on the Lethargy ($p = 0.116$) and Speech ($p = 0.236$) subscales were not significant. Similarly, C-PRS total scores were significantly higher among LD children ($M = 61.2$, $SD = 14.5$) compared to HC children ($M = 48.5$, $SD = 9.0$), $F(1,116) = 16.98$, $p < 0.001$, partial $\eta^2 = .128$. The LD group also showed significantly greater parent–child conflict ($p = 0.001$) and lower positive relationship quality ($p = 0.001$). Regarding parenting stress, LD children's parents reported significantly higher total PSI scores ($M = 86.5$, $SD = 30.0$) than HC parents ($M = 68.3$, $SD = 14.9$),

Table 1. Comparison of Sociodemographic Characteristics Between Groups

		Late Talkers (N = 60)			Healthy Controls (N = 60)			Statistics	
		n (%)	Mean (SD)	Mdn (IQR)	n (%)	Mean (SD)	Mdn (IQR)	U/Z or χ^2	*p*
Age *(months)*			40.7 (10.8)	39.0 (15.0)		42.1 (13.9)	39.5 (31.0)	1710.5 / -.471	.638
Gender	Girl	26 (43.3%)			35 (58.3%)			2.701	.100
	Boy	34 (56.7%)			25 (41.7%)				
Medical Condition		4 (6.7%)			-			-	.119
Medication Use		4 (6.7%)			-			-	.119
Family Structure	Nuclear	56 (93.3%)			58 (96.7%)			2.035	.361
	Extended	2 (3.3%)			2 (3.3%)				
	Parents Separated	2 (3.3%)			-				
Mother's Age *(years)*			32.3 (5.0)	33.0 (9.0)		34.0 (5.3)	33.5 (6.0)	1522.5 / -1.460	.144
Mother's Education *(years)*			11.0 (3.8)	12.0 (8.0)		14.7 (2.7)	16.0 (11.0)	847.0 / -5.467	< .001
Mother With Medical Condition		6 (10.0%)			9 (15.0%)			.686	.408
Mother with Psychiatric Condition		3 (5.0%)			5 (8.3%)			-	.717
Father's Age *(years)*			35.4 (4.9)	35.0 (8.0)		36.2 (5.2)	35.5 (6.0)	1666.0 / -.806	.480
Father's Education *(years)*			12.8 (3.7)	12.0 (4.0)		14.6 (2.6)	16.0 (4.0)	1283.5 / -2.946	.003
Father With Medical Condition		7 (11.7%)			4 (6.7%)			.901	.343
Father with Psychiatric Condition		3 (5.0%)			4 (6.7%)			-	1.000
Number of Siblings			1.0 (.9)	1.0 (2.0)		1.0 (.9)	1.0 (2.0)	1748.0 / -.289	.772
First Siblings		41 (68.3%)			39 (65.0%)			.150	.699
First Sibling's Age *(years)*			9.2 (4.1)	9.0 (6.0)		9.1 (6.0)	9.0 (11.0)	785.0 / -.140	.889
First Sibling's Gender	Girl	17 (28.3%)				17 (28.3%)		.037	.0848
	Boy	24 (40.0%)				22 (36.7%)			
First Sibling's Education *(years)*			5.1 (3.9)	5.0 (8.0)		5.8 (4.8)	5.0 (8.0)	733.0 / -.665	.506

Table 1. Comparison of Sociodemographic Characteristics Between Groups

		Late Talkers (N = 60)			Healthy Controls (N = 60)			Statistics	
		n (%)	Mean (SD)	Mdn (IQR)	n (%)	Mean (SD)	Mdn (IQR)	U/Z or χ^2	*p*
First Sibling with Medical Condition		2 (3.3%)			1 (1.7%)			-	1.000
First Sibling with Psychiatric Condition		1 (1.7%)			1 (1.7%)			-	1.000
Second Siblings		16 (26.7%)			15 (25.0%)			.043	.835
Second Sibling's Age *(years)*			8.8 (3.8)	8.0 (6.5)		10.4 (4.2)	10.0 (6.0)	95.5 / -.980	.327
Second Sibling's Gender	Girl	4 (6.7%)			6 (10.0%)			-	.458
	Boy	12 (20.0%)			9 (15.0%)				
Second Sibling's Education (years)			5.1 (3.3)	5.0 (6.8)		7.5 (3.8)	8.0 (3.0)	82.5 / -1.572	.116
Second Sibling with Medical Condition		-			-			-	-
Second Sibling with Psychiatric Condition		2 (3.3%)			1 (1.7%)			-	1.000
Third Sibling		4 (6.7%)			3 (5.0%)			.152	.697
Third Sibling's Age (years)			7.5 (1.3)	7.5 (2.5)		5.7 (3.1)	5.0 (.0)	3.5 / -.892	.372
Third Sibling's Gender	Girl	3 (5.0%)			3 (5.0%)			-	1.000
	Boy	1 (1.7%)			-				
Third Sibling's Education *(years)*			3.8 (2.5)	5.0 (3.8)		1.7 (2.9)	.0 (.0)	3.5 / -1.021	.307
Third Sibling with Medical Condition		-			-			-	-
Third Sibling with Psychiatric Condition		-			-			-	-
Socioeconomic status			2.7 (.7)	3.0 (1.0)		2.3 (.5)	2.0 (.0)		
Bilingualism		1 (1.7%)			1 (1.7%)			-	1.000
Family History of Late Talking		36 (60.0%)			7 (11.7%)			30.480	< .001

* There was a statistically significant difference in the number of unnoticed dental problems among the groups (Kruskal-Wallis H = 28.89, p < 0.001).

Table 2. Comparison of Developmental Milestones Between Groups

		Late Talkers (N = 60)		Healthy Controls (N = 60)		Statistics		Cohen d
		Mean (SD)	Mdn (IQR)	Mean (SD)	Mdn (IQR)	U/Z	p	
Developmental Milestones (months)	Head Control	2.0 (.7)	2.0 (.0)	2.2 (1.2)	2.0 (1.0)	1586.0 / -.760	.447	-
	Independent Sitting	6.4 (1.0)	6.0 (1.0)	6.3 (1.3)	6.0 (2.0)	1579.0/-.902	.367	-
	Walking	13.4 (2.8)	12.0 (2.0)	12.0 (1.5)	12.0 (2.0)	1233.5/-2.801	.005	.62
	First Word	15.7 (4.5)	15.0 (6.0)	10.6 (3.3)	10.0 (4.0)	530.0/-6.491	< .001	1.29
	First Sentence	27.1 (6.8)	29.0 (6.0)	19.2 (4.5)	18.5 (7.0)	33.5 / -5.319	< .001	1.37
	Toilet Training	32.0 (7.0)	30.0 (6.0)	28.6 (4.9)	29.5 (8.0)	539.5 / -2.498	.012	.56

Note. SD = standard deviation, Mdn = median, IQR = Interquartile range. *Continuous variables were analyzed using the Mann-Whitney U test.

$F(1,116) = 14.20$, $p < 0.001$, partial $\eta^2 = .109$. While the Parental Stress subscale did not differ significantly between groups ($p = 0.092$), the LD group scored higher on both the Parent–Child Dysfunctional Interaction ($p < 0.001$) and Difficult Child ($p = 0.001$) subscales.

Within the LD group, a substantial proportion of children exhibited psychiatric comorbidities. As shown in Figure 1, psychiatric comorbidities were common in the LD group (N = 60), with ADHD being the most frequently reported diagnosis (38.3%, n = 23). Speech Sound Disorder was also prevalent, observed in 18.3% of the group (n = 11), followed by Social (Pragmatic) Communication Disorder (10.0%, n = 6), and Childhood-Onset Fluency Disorder (3.3%, n = 2). Less frequently reported were Parasomnia (3.3%, n = 2) and Separation Anxiety Disorder (1.7%, n = 1).

Table 4 presents the Spearman's rank-order correlation coefficients (rs) and corresponding p-values for the subscales of the ABC, C-PRS, and PSI-SF. Within the ABC, the subscales were strongly intercorrelated, with coefficients ranging from .610 to .931 (all $p < 0.001$); for example, the ABC Total score was highly correlated with the Irritability ($rs = 0.927$, $p < .001$) and Hyperactivity ($rs = 0.931$, $p < 0.001$) subscales. Similarly, the CPRS subscales demonstrated robust associations, as the C-PRS Total score correlated significantly with both the Conflict ($rs = 0.552$, $p < 0.001$) and Positive Relationship ($rs = 0.939$, $p < 0.001$) subscales. For the PSI-SF, significant positive correlations were observed among the Total score and its subscales—Parenting Stress, Parent–Child Dysfunctional Interaction, and Difficult Child—with rs values ranging from 0.589 to 0.802 (all $p < 0.001$). Moreover, several significant cross-measure correlations emerged; for instance, the ABC Total score was moderately correlated with the CPRS Total ($rs = 0.569$, $p < 0.001$) and PSI Total ($rs = 0.515$, $p < 0.001$) scores. Correlations among behavioral problems, parent–child relationship, and parenting stress measures ranged from $rs = 0.265$ ($p = 0.040$) to $rs = 0.923$ ($p < 0.001$).

Table 5 presents the results of a stepwise linear regression analysis predicting PSI-SF Total from subscales of the ABC. The initial model included ABC-Irritability, ABC-Hyperactivity, ABC-Speech, ABC-Lethargy, and ABC-Stereotypic Behavior; however, only ABC-Irritability remained in the final model. The constant was 66.842 (SE = 4.993, $t = 13.388$, $p < 0.001$, 95.0% CI [56.848, 76.835]), indicating the expected PSI-SF Total score when ABC-Irritability is zero. ABC-Irritability significantly predicted PSI-SF Total ($B = 2.223$, $SE = 0.430$, $\beta = 0.562$, $t = 5.172$, $p < 0.001$, 95% CI [1.363, 3.084]); that is, each one-unit increase in ABC-Irritability was associated with a 2.223-unit increase in PSI-SF Total. Overall, the model accounted for 31.6% of the variance in PSI-Total ($R^2 = 0.316$, adjusted $R^2 = 0.304$), and the regression

Table 3. Comparison of the ABC, CPRS, and PSI Scores Between Groups

		Late Talkers (N = 60)		Healthy Controls (N = 60)		Statistics			Observed power
		Mean (SD)	Mdn (IQR)	Mean (SD)	Mdn (IQR)	F (1,116)	p	Partial η²	
ABC	TOTAL	28.6 (25.1)	22.0 (32.0)	11.8 (11.2)	9.0 (12.0)	11.79	.001	.092	.926
	Irritability	8.9 (7.6)	7.0 (12.0)	4.6 (5.2)	3.0 (5.0)	10.05	.002	.080	.882
	Lethargy	4.1 (5.3)	2.0 (4.0)	1.8 (3.0)	1.0 (2.0)	2.51	.116	.021	.348
	Stereotyped Behavior	1.8 (3.1)	1.0 (3.0)	.3 (.8)	.0 (.0)	5.22	.024	.043	.620
	Hyperactivity	11.9 (10.5)	9.5 (12.0)	4.1 (3.7)	3.0 (5.0)	16.58	<.001	.125	.981
	Speech	2.0 (2.4)	1.0 (3.0)	1.1 (1.3)	1.0 (2.0)	1.42	.236	.012	.219
CPRS	TOTAL	61.2 (14.5)	61.0 (21.0)	48.5 (9.0)	47.5 (13.0)	16.98	<.001	.128	.983
	Conflict	36.9 (11.0)	37.0 (17.0)	28.6 (7.2)	27.5 (10.0)	11.67	.001	.091	.923
	Positive Relationship	24.3 (6.1)	24.0 (7.0)	20.2 (3.8)	20.0 (5.0)	10.99	.001	.087	.908
PSI	TOTAL	86.5 (30.0)	80.0 (40.0)	68.3 (14.9)	66.5 (25.0)	14.20	<.001	.109	.962
	Parenting Stress	32.3 (11.6)	31.0 (18.0)	29.2 (7.6)	28.5 (11.0)	2.89	.092	.024	.392
	Parent-Child Dysfunctional Interaction	24.1 (9.5)	23.0 (11.0)	16.3 (4.6)	15.0 (7.0)	26.48	<.001	.186	.999
	Difficult Child	30.2 (12.3)	29.0 (20.0)	22.8 (7.6)	22.0 (10.0)	11.44	.001	.090	.918

Note. SD = standard deviation. Mdn = median. IQR = Interquartile range. ABC = Aberrant Behavior Checklist. CPRS = child-parent relationship scale. PSI = parent stress index. * Continuous variables were analyzed using analysis of covariance (ANCOVA), controlling for parental education levels as covariates.

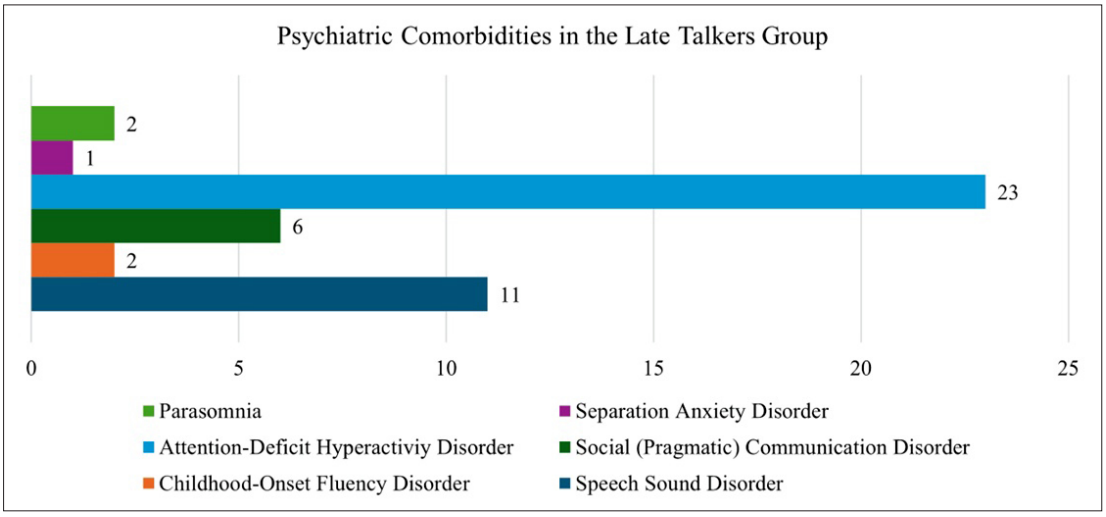

Figure 1: Psychiatric Comorbidities in the Late Talkers Group.

Table 4. Correlation Analysis Among ABC, CPRS, and PSI Subscales

		ABC												CPRS						CPRS							
		T		I		L		SB		H		S		T		C		PR		T		PS		PCDI		DC	
		r^s	p	r^s	p	r^s	p	r^s	p	r^s	p	r^s	p	r^s	p	r^s	p	r^s	p	rs	p	rs	p	rs	p	rs	p
ABC	T	1.000	.																								
	I	.927	< .001	1.000	.																						
	L	.728	< .001	.563	< .001	1.000	.																				
	SB	.792	< .001	.662	< .001	.649	< .001	1.000	.																		
	H	.931	< .001	.819	< .001	.583	< .001	.707	< .001	1.000	.																
	S	.610	< .001	.549	< .001	.421	.001	.580	< .001	.520	< .001	1.000	.														
CPRS	T	.569	< .001	.472	< .001	.526	< .001	.492	< .001	.553	< .001	.515	< .001	1.000	.												
	C	.552	< .001	.493	< .001	.564	< .001	.433	.001	.489	< .001	.536	< .001	.939	< .001	1.000	.										
	PR	.265	.040	.137	.297	.133	.310	.318	.013	.362	.004	.115	.382	.579	< .001	.298	.021	1.000	.								
PSI	T	.572	< .001	.535	< .001	.426	.001	.393	.002	.520	< .001	.589	< .001	.753	< .001	.755	< .001	.330	.010	1.000	.						
	PS	.440	< .001	.420	.001	.263	.042	.241	.064	.409	.001	.423	.001	.581	< .001	.606	< .001	.229	.079	.889	< .001	1.000	.				
	PCDI	.523	< .001	.428	.001	.457	< .001	.438	< .001	.490	< .001	.537	< .001	.634	< .001	.634	< .001	.285	.027	.804	< .001	.612	< .001	1.000	.		
	DC	.590	< .001	.560	< .001	.482	< .001	.417	.001	.521	< .001	.595	< .001	.802	< .001	.783	< .001	.393	.002	.923	< .001	.719	< .001	.703	< .001	1.000	.

Note. ABC = Aberrant Behavior Checklist, CPRS = child-parent relationship scale, PSI = Parenting Stress Index, T = Total Score, I = Irritability, L = Lethargy, SB = Stereotyped Behavior. H = Hyperactivity, S = Speech, C = Conflict, PR = positive relationship, PS = Parental Stress, PCDI = Parent–Child Dysfunctional Interaction, DC = Difficult Child. *Spearman's rank-order correlation coefficients (rs) and their associated p-values are presented for the subscales of the ABC (T, I, L, SB, H, S), CPRS (T, C, PR), and PSI (T, PS, PCDI, DC) measures.

Table 5. Stepwise Lineer Regression Analyses

		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Standard Error	Beta	t	Significance	Lower Bound	Upper Bound
1	(constant)	66.842	4.993		13.388	< .001	56.848	76.835
	ABC - Irritability	2.223	.430	.562	5.172	< .001	1.363	3.084

Note. ABC = Aberrant Behaviour Checklist. A stepwise linear regression analysis was conducted with PSI-Total as the dependent variable. The initial model included ABC-Irritability, ABC-Hyperactivity, ABC-Speech, ABC-Lethargy, and ABC-Stereotypic Behavior as independent variables. Ultimately, ABC-Hyperactivity, ABC-Lethargy, ABC-Stereotypic Behavior, and ABC-Speech were excluded from the final model. Model Summary, R2 = .316, Adj. R2 = .304, F = 26.745, p < .001

model was statistically significant, $F = 26.745$, $p < 0.001$.

An examination of familial psychiatric and medical comorbidities revealed diverse conditions across both groups, though no consistent pattern of group-specific clustering was observed (see Table 6). Among mothers, conditions such as goiter (5.0%) and major depressive disorder (3.3%) were reported only in the LD group, while papillary thyroid cancer (3.3%), panic disorder (3.3%), and adult-diagnosed ADHD (3.3%) were observed exclusively in the HC group. Celiac disease was present in both groups (LD: 1.7%; HC: 3.3%). Among fathers, hypertension was the most common condition, reported in 8.3% of LD cases and 3.3% of HC cases. Epilepsy and asthma were reported only in LD fathers (1.7% each), while hyperlipidemia and various psychiatric diagnoses (e.g., obsessive-compulsive disorder, generalized anxiety disorder, ADHD) appeared solely in HC fathers, each with a frequency of 1.7%. Notably, an unspecified psychiatric disorder was more frequently reported in LD fathers (5.0%) compared to HC fathers (1.7%). Regarding siblings, ADHD was identified in both groups (1.7% in each), while other conditions such as asthma and heart failure appeared in isolated cases. The second siblings of LD children had higher rates of ADHD (3.3%), whereas second siblings in the HC group showed one case of obsessive-compulsive disorder (1.7%).

DISCUSSION

This study aimed to compare children with LD and their TD peers in terms of behavioral problems, parenting stress, and the quality of the parent–child relationship, and to identify psychiatric comorbidities in children with LD. Consistent with one of our hypotheses, children with LD exhibited significantly more behavioral problems and higher levels of parenting stress, as well as a lower quality of the parent-child relationship compared to TD peers. As expected, psychiatric comorbidities were common in the LD group, with ADHD emerging as the most prevalent diagnosis, identified in 38.0% of the participants. Finally, irritability was found to be an important predictor of parenting stress in children with LD.

A review of the literature has revealed that poorer language competence is closely associated with externalizing problems (8-10). Expressive language plays a particularly important role in children's emotion regulation and social problem-solving, and several studies have highlighted its self-regulatory function (34, 35). Language enables children to label, reflect on, and manage their internal emotional states. In addition to supporting self-expression, it also facilitates the recognition and interpretation of others' emotions. When language development is limited, children may struggle to understand emotional cues, which can hinder their ability to navigate social interactions effectively (36). Furthermore, difficulties in verbally expressing emotions and needs can lead to frustration or anger, which may contribute to the development of externalizing behaviors (10). Poorer language competence is also associated with a greater risk of peer rejection—an established risk factor for externalizing problems (37). These findings highlight the need for systematic evaluation and management of externalizing symptoms in children with LD, given their

Table 6. Comparison of the Psychiatric and Medical Comorbidities of the Family			
		Late Talkers (N = 60)	**Healthy Controls (N = 60)**
Mother	Psoriasis	-	1 (1.7%)
	Papillary Thyroid Cancer	-	2 (3.3%)
	Lumbar Disc Herniation	-	1 (1.7%)
	Insulin Resistant	1 (1.7%)	-
	Hypothyroid	-	1 (1.7%)
	Goiter	3 (5.0%)	-
	Familial Mediterranean Fever	-	1 (1.7%)
	Celiac Disease	1 (1.7%)	2 (3.3%)
	Amputation	-	1 (1.7%)
	Panic Disorder	-	2 (3.3%)
	Major Depressive Disorder	2 (3.3%)	-
	Attention-Deficit Hyperactivity Disorder	-	2 (3.3%)
	Other Anxiety Disorder	1 (1.7%)	1 (1.7%)
Father	Ulcerative Colitis	-	1 (1.7%)
	Immune Thrombocytopenic Purpura	-	1 (1.7%)
	Hypertension	5 (8.3%)	2 (3.3%)
	Hyperlipidemia	-	1 (1.7%)
	Epilepsy	1 (1.7%)	-
	Asthma	1 (1.7%)	-
	Generalized Anxiety Disorder	-	1 (1.7%)
	Obsessive Compulsive Disorder	-	1 (1.7%)
	Attention-Deficit Hyperactivity Disorder	-	1 (1.7%)
	Unknown Psychiatric Disorder	3 (5.0%)	1 (1.7%)
First Sibling	Heart Failure	1 (1.7%)	-
	Asthma	1 (1.7%)	1 (1.7%)
	Attention-Deficit Hyperactivity Disorder	1 (1.7%)	1 (1.7%)
Second Sibling	Obsessive Compulsive Disorder	-	1 (1.7%)
	Attention-Deficit Hyperactivity Disorder	2 (3.3%)	-

tendency to emerge earlier and their potentially more disruptive impact on the child and family.

Although prior research has identified a relationship between parenting stress and the child's language ability, this area remains relatively underexplored compared to other neurodevelopmental disorders, highlighting a notable gap in the literature. Language and speech difficulties are not only a concern for the affected child but also have important implications for overall family dynamics. Indeed, delayed speech is one of the most common reasons for referral among children with developmental difficulties (15). Parents of children with LD may experience heightened stress due to feelings of inadequacy related to difficulties in communicating with their child, concerns about potential social exclusion, and uncertainties about the prognosis of LD (38). Concerns about limited access to appropriate speech and language interventions, as well as the associated financial burden, may also contribute to elevated levels of parenting stress. Furthermore, reduced opportunities for leisure, negative reactions from others, and increased social isolation are additional factors that may further heighten the emotional burden experienced by parents (39). On the other hand, parenting stress is influenced by various factors, such as socioeconomic status, parental psychopathology, and marital satisfaction (39). Therefore, to more accurately assess parenting stress in this sample, future studies should account for potential confounding variables and consider differences across specific subtypes of LD.

Some studies suggest that increased parenting stress in children with LD may be more influenced by the child's externalizing symptoms than by the language difficulties (40). In our study, irritability emerged as a strong predictor of parenting stress in parents of children with LD, highlighting its particularly prominent role among these externalizing symptoms. This finding is consistent with previous research identifying irritability as a transdiagnostic risk factor implicated in various psychiatric disorders (41), and strongly associated with family dysfunction and elevated levels of parenting stress (42). Difficulties in language development, as well as temper outbursts and frustration intolerance, may be associated with parental feelings of anger, inadequacy, and exhaustion, all of which are associated with increased levels of parenting stress. The need for constant vigilance in anticipation of potential outbursts, the unpredictability of when crises might arise, and the likelihood of receiving negative judgments from others due to the child's challenging behaviors may further contribute to increased social isolation. This social isolation, in turn, may represent another factor linked to increased parenting stress. Furthermore, attempts to cope with a child's irritability may be associated with an increased likelihood of negative parenting practices, such as yelling or harsh disciplinary responses. This pattern may reinforce the child's irritability, potentially creating a vicious cycle. These dynamics may negatively affect the parent–child relationship and overall family functioning (42). For all these reasons, conducting a detailed assessment of externalizing symptoms, particularly irritability, in every child presenting with language problems is vital both for understanding the child's developmental needs and for guiding appropriate therapeutic interventions for the family.

There are multiple factors that may contribute to the reduced quality of parent–child relationships in children diagnosed with LD. A longitudinal study of children's language development revealed that beyond the quantity of linguistic input, a child's active engagement in communication and the parent's responsiveness to the child's interests play a critical role in fostering language acquisition (43). This interaction-based process supports language development through mechanisms such as joint attention and communicative exchanges. However, this reciprocal structure may be impaired in children with LD. Difficulties in verbal expression may reduce a child's participation in language-rich social contexts, such as pretend play, storytelling, conversational exchanges during daily routines, singing songs, and reciting nursery rhymes. This may in turn diminish the frequency and quality of parent–child interactions. On the other hand, studies have also shown that parents of children with LD tend to speak less and respond less frequently to their child's attempts at communication (44). However, it remains unclear whether these patterns reflect a parental reaction to the child's limited language abilities or constitute a contributing factor to reduced quality of interaction. Our findings revealed a consistent pattern of significant correlations among behavioral problems, parent–child relationship dynamics, and parenting stress. This suggests that language development difficulties should not be viewed solely as individual challenges, but rather as components of a broader network of interacting factors that influence parenting stress, relationship quality, and overall developmental trajectories.

These findings highlight the high prevalence of neurodevelopmental and behavioral comorbidities in children with LD, particularly ADHD. This frequent co-occurrence of ADHD is largely due to overlapping neurodevelopmental mechanisms, including attention, impulse control and language development. Children with both LD and ADHD often experience more pronounced reading and learning difficulties, which may have an additional negative impact on their academic success (23). Recognizing this common comorbidity is crucial for the early identification and targeted intervention, both of which are critical to improving developmental trajectories in this population.

Although our analyses did not show a significant effect of parental education level on the results, previous research consistently demonstrates a positive relationship between parental education and the quality of the parent–child relationship. One possible explanation is that the financial difficulties, often associated with lower household income, may reduce parents' use of warm and responsive parenting practices. Lower income has also been associated with limited access to materials that foster children's cognitive and socio-emotional development, along with reduced participation in recreational activities. In addition, parents with higher levels of education are more likely to have access to knowledge about child development and education. This may facilitate the adoption of more informed and supportive parenting practices across multiple domains, including language development (45-47). Furthermore, previous studies have shown that parental education level is negatively associated with parenting stress. This association may be attributable to the limited access to social support networks, limited parenting knowledge, skills, and resources, and lower self-efficacy often observed among parents with lower levels of education (48). Therefore, parental education should still be considered a potentially important determinant in different contexts.

Strengths and Limitations

This study has several important strengths. It provides a comprehensive evaluation of children with LD, with a particular focus on behavioral problems, parenting stress, and the quality of the parent–child relationship. The inclusion of a healthy control group matched for age, gender, and a range of sociodemographic variables enhances methodological rigor and supports the validity of the findings. In addition to detailed sociodemographic, personal, and family history data, as well as developmental trajectories, the systematic assessment of psychiatric comorbidities further contributes to the robustness of the study design.

However, several limitations should be noted. The cross-sectional design precludes any inference of causality between the variables examined. The recruitment of participants from only two clinical centers may restrict the generalizability of the findings. Additionally, The use of standardized scales rather than direct observational methods to assess parameters such as the parent–child relationship and parenting stress constitutes a notable limitation of the study. Although comprehensive clinical interviews were conducted to diagnose LD, the absence of objective language assessment tools (e.g., TEDIL) represents a limitation. In addition, while ANCOVA results showed that parental education level did not significantly affect the main findings, it may still be considered a potential confounding factor, given its influence on children's language development and broader parenting practices. Furthermore, since the LD group was selected through clinical applications, children with more severe symptoms are likely to be overrepresented, which may limit the generalizability of the findings to the population. Finally, the study did not include a detailed evaluation of potential confounding factors such as socioeconomic status, marital satisfaction, and parental psychopathology, all of which are known to influence parenting stress and the parent–child relationship.

This study highlights that children with LD show significantly more behavioral problems, increased parenting stress, and poorer quality in parent–child relationships compared to their TD peers. Notably, irritability emerged as a strong predictor of parenting stress. In addition, the high prevalence of psychiatric comorbidities, particularly ADHD, further emphasizes the multifaceted nature of LD as a neurodevelopmental disorder. These findings suggest that LD should be conceptualized as part of a broader developmental profile with significant behavioral and parental implications, rather than solely as a language impairment. Early, multidimensional interventions targeting child externalizing problems—particularly irritability—as well as parenting stress and the parent–child relationship are important. Future longitudinal research is needed to clarify causal pathways and guide individualized therapeutic interventions.

REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington VA: American Psychiatric Publishing; 2013.
2. Sansavini A, Favilla ME, Guasti MT, Marini A, Millepiedi S, Di Martino MV, et al. Developmental language disorder: early predictors, age for the diagnosis, and diagnostic tools. A scoping review. Brain Sci. 2021;11(5):654.
3. Norbury CF, Gooch D, Wray C, Baird G, Charman T, Simonoff E, et al. The impact of nonverbal ability on prevalence and clinical presentation of language disorder: evidence from a population study. J Child Psychol Psychiatry. 2016;57(11):1247-1257.
4. Tomblin JB, Records NL, Buckwalter P, Zhang X, Smith E, O'Brien M. Prevalence of specific language impairment in kindergarten children. J Speech Lang Hear Res. 1997;40(6):1245-1260.
5. Clegg J, Hollis C, Mawhood L, Rutter M. Developmental language disorders--a follow-up in later adult life. Cognitive, language and psychosocial outcomes. J Child Psychol Psychiatry. 2005;46(2):128-149.
6. Curtis PR, Frey JR, Watson CD, Hampton LH, Roberts MY. Language disorders and problem behaviors: a meta-analysis. Pediatrics. 2018;142(2):e20173551.
7. Beitchman JH, Wilson B, Brownlie EB, Walters H, Inglis A, Lancee W. Long-term consistency in speech/language profiles: II. Behavioral, emotional, and social outcomes. J Am Acad Child Adolesc Psychiatry. 1996;35(6):815-825.
8. Donolato E, Cardillo R, Mammarella IC, Melby-Lervåg M. Research Review: Language and specific learning disorders in children and their co-occurrence with internalizing and externalizing problems: A systematic review and meta-analysis. J Child Psychol Psychiatry. 2022;63(5):507-518.
9. Wang MV, Aarø LE, Ystrom E. Language delay and externalizing problems in preschool age: a prospective cohort study. J Abnorm Child Psychol. 2018;46:923–933.
10. Petersen IT, LeBeau B. Language ability in the development of externalizing behavior problems in childhood. J Educ Psychol. 2021;113(1):68.
11. Liles BD, Newman E, Lagasse LL, Derauf C, Shah R, Smith LM, et al. Perceived child behavior problems, parenting stress, and maternal depressive symptoms among prenatal methamphetamine users. Child Psychiatry Hum Dev. 2012;43(6):943-957.
12. Abidin RR. The Parenting Stress Index. Charlottesville (VA): Pediatric Psychology Press; 1983.
13. Craig F, Operto FF, De Giacomo A, Margari L, Frolli A, Conson M, et al. Parenting stress among parents of children with neurodevelopmental disorders. Psychiatry Res. 2016;30:121-129.
14. Martin CA, Papadopoulos N, Chellew T, Rinehart NJ, Sciberras E. Associations between parenting stress, parent mental health and child sleep problems for children with ADHD and ASD: Systematic review. Res Dev Disabil. 2019;93:103-463.
15. Tervo RC. Parent's reports predict their child's developmental problems. Clin Pediatr (Phila). 2005;44(7):601-611.
16. Perkins SC, Finegood ED, Swain JE. Poverty and language development: roles of parenting and stress. Innov Clin Neurosci. 2013;10(4):10-19.
17. Theule J, Wiener J, Tannock R, Jenkins JM. Parenting stress in families of children with ADHD: a meta-analysis. J Emot Behav Disord. 2010;21(1):3-17.
18. Roberts MY, Kaiser AP. The effectiveness of parent-implemented language interventions: a meta-analysis. Am J Speech Lang Pathol. 2011;20(3):180-199.
19. Temelturk RD, Yurumez E, Cıkılı Uytun M, Oztop DB. Parent-child interaction, parental attachment styles and parental alexithymia levels of children with ASD. Res Dev Disabil. 2021;112:103-922.
20. Schodorf JK, Edwards HT. Comparative analysis of parent-child interactions with language-disordered and linguistically normal children. J Commun Disord. 1983;16(2):71-83.
21. Lasky EZ, Klopp K. Parent-child interactions in normal and language-disordered children. J Speech Hear Disord. 1982;47(1):7-18.
22. Blackwell AK, Harding S, Babayiğit S, Roulstone, S. Characteristics of parent–child interactions: a systematic review of studies comparing children with primary language impairment and their typically developing peers. Commun Disord Q. 2015;36(2):67-78.
23. Méndez-Freije I, Areces D, Rodríguez C. Language skills in children with attention deficit hyperactivity disorder and developmental language disorder: a systematic review. Children (Basel). 2023;11(1):14.
24. Nitin R, Shaw DM, Rocha DB, Walters CE Jr, Chabris CF, Camarata SM, et al. Association of developmental language disorder with comorbid developmental conditions using algorithmic phenotyping. JAMA Netw Open. 2022;5(12):e2248060.
25. Hawkins E, Gathercole S, Astle D, The Calm Team, Holmes J. Language problems and ADHD symptoms: how specific are the links? Brain Sci. 2016;6(4):50.
26. Dittman CK. The impact of early classroom inattention on phonological processing and word-reading development. J Atten Disord. 2016;20(8):653-664.
27. Claessen M, Leitão S, Kane R, Williams C. Phonological processing skills in specific language impairment. Int J Speech Lang Pathol. 2013;15(5):471-483.
28. Beitchman JH, Wilson B, Johnson CJ, Atkinson L, Young A, Adlaf E, et al. Fourteen-year follow-up of speech/language-impaired and control children: psychiatric outcome. J Am Acad Child Adolesc Psychiatry. 2001;40(1):75-82.
29. Aman MG, Singh NN, Stewart AW, Field CJ. The aberrant behavior checklist: a behavior rating scale for the assessment of treatment effects. Am J Ment Defic. 1985;89(5):485–491.
30. Karabekiroğlu K, Aman MG. Validity of the aberrant behavior checklist in a clinical sample of toddlers. Child Psychiatry Hum Dev. 2009;40(1):99–110.
31. Mert E, Hallıoğlu O, Camdeviren HA. Turkish version of the parenting stress index short form: a psychometric study. Turkiye Klinikleri J Med Sci. 2008;28(3): 291-296.
32. Pianta RC. Child-Parent Relationship Scale. Unpublished measure. University of Virginia; 1992.
33. Akgün E, Yeşilyaprak B. Çocuk anababa ilişki ölçeği türkçe formunun geçerlik ve güvenirlik çalışması. BAUNSOBED. 2010;13(24):44-53.

34. Montroy JJ, Bowles RP, Skibbe LE, McClelland MM, Morrison FJ. The development of self-regulation across early childhood. Dev Psychol. 2016;52(11):1744-1762.

35. Skibbe LE, Montroy JJ, Bowles RP, Morrison FJ. Self-regulation and the development of literacy and language achievement from preschool through second grade. Early Child Res Q. 2019;46:240-251.

36. Salmon K, O'Kearney R, Reese E, Fortune CA. The role of language skill in child psychopathology: implications for intervention in the early years. Clin Child Fam Psychol Rev. 2016;19(4):352-367.

37. 3Menting B, van Lier PA, Koot HM. Language skills, peer rejection, and the development of externalizing behavior from kindergarten to fourth grade. J Child Psychol Psychiatry. 2011;52(1):72-79.

38. Poyraz A, Gul F. Gelişimsel dil bozukluğu olan ve olmayan okul öncesi çocuklarda iletişim becerileri, ebeveyn tutumları ve ebeveynin stres düzeyinin değerlendirilmesi. IGUSABDER. 2022;174–189.

39. Lisa R, Pola R, Franz P, Jessica M. Developmental language disorder: maternal stress level and behavioural difficulties of children with expressive and mixed receptive-expressive DLD. J Commun Disord. 2019;80:1-10.

40. Vermeij BAM, Wiefferink CH, Knoors H, Scholte R. Association of language, behavior, and parental stress in young children with a language disorder. Res Dev Disabil. 2019;85:143-153.

41. Leibenluft E, Allen LE, Althoff RR, Brotman MA, Burke JD, Carlson GA, et al. Irritability in youths: a critical integrative review. Am J Psychiatry. 2024;181(4):275-290.

42. Zendarski N, Galligan R, Coghill D, Payne JM, De Luca CR, Mulraney M. The associations between child irritability, parental distress, parental irritability and family functioning in children accessing mental health services. J Child Fam Stud. 2023;32:288–300.

43. Zimmerman FJ, Gilkerson J, Richards JA, Christakis DA, Xu D, Gray S, et al. Teaching by listening: the importance of adult-child conversations to language development. Pediatrics. 2009;124(1):342-349.

44. van Witteloostuijn M, Haggiyannes A, de Bree E, Blom E. Parental input and its relationship with language outcomes in children with (suspected) developmental language disorder: a systematic review. JSLHR. 2025;68(4):1982-2005.

45. Davis-Kean PE. The influence of parent education and family income on child achievement: the indirect role of parental expectations and the home environment. J Fam Psychol. 2005;19(2):294-304.

46. Zhang X. The effects of parental education and family income on mother–child relationships, father–child relationships, and family environments in the People's Republic of China. Fam Process. 2012;51(4):483-97.

47. Bradley RH, Corwyn RF, McAdoo HP, Coll CG. The home environment of children in the United States. Part I: variations by age, ethnicity, and poverty status. Child Dev. 2001;72(6):1844-1867.

48. Fang Y, Luo J, Boele M, Windhorst D, van Grieken A, Raat H. Parent, child, and situational factors associated with parenting stress: a systematic review. Eur Child Adolesc Psychiatry. 2024;33(6):1687-1705.

Abbreviations List

LD: Language Disorder
TD: Typically Developing
ADHD: Attention Deficit Hyperactivity Disorder
HC: Healthy Control
ABC: Aberrant Behavior Checklist
PSI-SF: Parenting Stress Index-Short Form
C-PRS: Child-Parent Relationship Scale
IQR: Interquartile Ranges
SPSS: Statistical Package for the Social Sciences

Ethics Approval and Consent to Participate

The study was approved by Uşak University Medical Ethics Committee for Clinical Studies (November 7, 2024/ No: 469-469-16), and the protocols followed the Declaration of Helsinki. Written and verbal informed consent was obtained from all of the participants.

Consent for Publication

Consent for publication was obtained from all authors.

Availability of Data and Materials

Data available from the corresponding author on request due to privacy/ethical restrictions.

Competing Interests

None to declare.

Funding

No funding was received for the study.

Authors Contributions

Idea/Concept: HGO. Design: HGO, MEÖ. Control/Supervısıon: RDT. Data Collectıon And/Or Processıng: HGO, MEÖ. Analysıs And/Or Interpretatıon: MEÖ. Lıterature Revıew: HGO. Wrıtıng The Artıcle: HGO, MEÖ. Crıtıcal Revıew: RDT. References And Fundıngs: HGO. Materıals: HGO. Other: HGO, MEÖ, RDT.

Acknowledgements

None to declare.