

Prevalence of Speech and Language Delay in Early School-Aged Children

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Purpose: Elementary school is a crucial time for children's language development as they acquire skills essential for learning. This study investigates the prevalence of speech and language development delays among early elementary school children in South Korea, providing insight into the speech and language development challenges faced by young students in the country.

Methods: Ten speech-language pathologists conducted a screening test for speech and language disorders on a sample of 381 elementary school children aged 7 to 9 (boys 200, girls 181) from the Busan and Gwangju areas in Korea. They used the Receptive and Expressive Vocabulary Test (REVT) and the Urimal Test of Articulation and Phonology Test (UTAP).

Results: Among the 381 children who underwent the test, 170 were identified as being at risk for having speech or language delay or disorders. This suggests that approximately 44.6% of the general population may exhibit speech or language problems. The prevalence of language delays was 35.6% for receptive vocabulary, 27.6% for expressive vocabulary, and 6.04% for speech delays. For boys, language delays were expected to range from 12.9% to 19.7%, while for girls, it was expected to be between 14.6% and 16.0%. In contrast, for articulation issues, 3.9% of boys and 2.1% of girls were found to have speech problems. Most of these children had not only language issues but also some speech disorders. Approximately 4.2% of the identified children had both speech and language problems, 38.6% had only language problems, and 1.8% had only speech problems.

Conclusions: The high prevalence of language development delays among early elementary school children underscores the critical need for proactive language screening and intervention in the school environment.

Keywords: Screening, Diagnostic classification, Prevalence, Speech and language delay, School-based SLP



Received: December 8, 2024

Revision: December 31, 2024

Accepted: December 31, 2024

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INTRODUCTION

Language and speech development are fundamental components of a child's overall growth and development, but language and speech production difficulties are common issues during the developmental process [1]. Speech delay is a situation where a child's spoken language samples are less consistent or exhibit age-inappropriate speech sound error patterns compared to developmental expectations [2]. Developmental language disorder (DLD) is a communication disorder that hinders language learning, understanding, and use. These language difficulties cannot be explained by other conditions, such as hearing loss or autism, nor by insufficient exposure to lan-

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guage [3]. Children with language delay/disorder can also have long-term difficulties that persist to adolescence and beyond, with some 30-60% experiencing continuing problems in reading and spelling [4].

However, many children enter school with deficiencies in their speech and language skills [5]. Numerous children experience difficulties in areas such as articulation, vocabulary, and grammar, which can significantly hinder their learning process. The elementary school period, in particular, is a critical time for rapid language development, which is essential for learning. During this period, language and speech development disorders can negatively affect future academic achievement and social interactions. These disorders typically manifest as articulation and phonological difficulties, vocabulary deficits, grammatical errors, and challenges in social interactions, which can impede a child's ability to communicate effectively both inside and outside the classroom, ultimately hindering their learning outcomes [6].

According to prevalence studies, 7-16% of children are reported to have poor language development that cannot be explained by other developmental disorders, with scores falling more than 1.5 standard deviations below the mean of standard reference tests [7]. Additionally, 2.3% of children experience language issues as part of another neurodevelopmental disorder [8]. Data on the prevalence of language disorders in elementary school children indicate that boys are more significantly affected than girls [1,9].

Language difficulties often remain unresolved at the time of school entry, with vocabulary development during the preschool years continuing to influence language skills thereafter [10,11]. DLD affects approximately 7% of children at the time of school entry [8]. Evidence suggests that untreated language delays may persist in 40-60% of affected children, with these children being at higher risk for social, emotional, behavioral, and cognitive difficulties [12,13]. Furthermore, longitudinal studies indicate that children and adolescents with DLD not only face significant communication challenges but are also at higher risk for lifelong impacts in areas such as education, employment [14], quality of life [15], mental health [16], and overall well-being [17], as well as enduring challenges in life satisfaction [18].

In another study, the prevalence of speech and language delays among children aged 1 to 12 in India was 2.53% [19]. In Australia, 6.4% of 10-year-old elementary school children were found to have DLD, with 33.7% ($n=35$) exhibiting expressive language deficits, 20.2% ($n=21$) showing receptive

language deficits, and 46.2% ($n=48$) experiencing both receptive and expressive language deficits. No significant gender differences were observed in this population [20].

Estimates of the prevalence of DLD in English-speaking countries suggest that approximately 7% of children aged 4-5 years meet diagnostic criteria for the disorder, with a higher prevalence in males (57-59%) [8,21]. A potential decline in prevalence has been observed among children aged 7 to 9 years [11].

According to international literature on the prevalence of communication disorders, 2-8% of preschool and school-aged children are affected by such disorders [22,23]. In Canada, parents of children aged 4 to 6 commonly express concerns regarding their child's development, particularly about expressive and receptive language, which are major areas of concern for many parents at the time of school entry [24].

Despite the importance of identifying young children at risk for poor developmental outcomes, little research identifies speech and language delays in children in the early years of elementary school in Korea. Therefore, there is an urgent need for a specialized approach to address these issues. In particular, speech therapy and speech development support in school settings are crucial in helping children adapt smoothly to school life. School-based speech-language pathologists (SLPs) are essential professionals in early diagnosing speech and language disorders, providing individualized therapy and support tailored to each child's developmental level [25]. Moreover, SLPs in schools collaborate with teachers and parents to ensure children successfully adapt to academic and social activities. This study aims to identify the speech and language problems among the early years of school-age children, estimate the prevalence of speech and language delay or disorders among this population, and particularly emphasize the importance of early screening and intervention in schools.

METHODS

Participants

This study was conducted in 2023-2024 across four elementary schools in the Busan area of the Gyeongsang region and Gwangju area of the Jeolla region in South Korea, with a total of 381 children, including 200 boys (52.5%) and 181 girls (47.5%), aged 7-9 years (grades 1-3). Written consent was obtained from the children's guardians before registration, and children whose guardians did not consent to participate were

excluded from the study. The information on the children who participated in the study is shown in Table 1.

Study procedures

For children who agreed to undergo the speech and language screening, 10 SLPs administered two standardized speech and language assessment tools: the Receptive and Expressive Vocabulary Test (REVT) [26] and the Urimal Test of Articulation and Phonology Test (UTAP) [27]. These tools were used to assess overall vocabulary and articulation development. Data collection for the REVT-E was completed for 309 out of the 381 children, while the REVT-R and UTAP were conducted with all 381 children.

Children at risk for language delay were categorized based on the standard score results from the REVT. All raw scores across primary variables were converted to z-scores for analysis. A standard score of -1 SD or above was considered normal, -1 SD to -2 SD was classified as mildly delayed, and -2 SD or below was diagnosed as delayed. Similarly, based on the standard score results from UTAP, a score of -1 SD or above was considered normal, -1 SD to -2 SD was classified as mildly delayed, and -2 SD or below was diagnosed as delayed.

Statistical analyses

Data was entered using Microsoft Excel 2017 and analyzed with the Statistical Package for Social Sciences (SPSS), version 24.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were reported as means, standard deviations, and frequencies. Chi-square analysis assessed the prevalence of speech and language delays by grade and gender. To examine differences in vowel accuracy and consonant accuracy by gender and grade, a two-way analysis of variance (ANOVA) was performed, with a significance level set at 0.05.

RESULTS

During the study period, 381 children aged 7 to 9 participated

Table 1. Demographic information of participants (N=381)

	1st grade (N = 121)	2nd grade (N = 137)	3rd grade (N = 123)
Age	7.3±2.9	8.6±3.1	9.6±3.0
Gender (%)			
Boys	81 (66.9)	58 (42.3)	62 (50.4)
Girls	40 (33.1)	79 (57.7)	61 (49.6)

in the language screening test, and 170 children (44.6%) experienced speech and language delays. One of these children had autistic traits. The prevalence of language development delay was 35.6% for receptive vocabulary, 27.6% for expressive vocabulary, and 6.04% for articulation delay, with language delays being more prominent than articulation delays.

Prevalence of language delay by gender and grade

Tables 2 and 3 present the cross-tabulations of receptive language delay based on diagnostic classifications by gender and grade.

The results showed no significant difference based on gender and frequency of receptive language delay ($\chi^2(2) = 1.959$, $p = 0.375$), grade and frequency of receptive language delay ($\chi^2(4) = 4.988$, $p = 0.289$).

In addition, Tables 4 and 5 display the cross-tabulations of expressive language delay based on diagnostic classifications by gender and grade.

The chi-square test results showed no significant difference based on gender and frequency of expressive language delay ($\chi^2(2) = 0.553$, $p = 0.758$) or grade and frequency of expressive language delay ($\chi^2(4) = 4.301$, $p = 0.367$).

Table 2. Prevalence of receptive language delay by gender in early years of school children

		Boys (N = 200)	Girls (N = 181)	Total (N = 381)
WNL	Frequency (%)	125 (51.0)	120 (49.0)	245 (100)
Mildly delayed	Frequency (%)	33 (50.0)	33 (50.0)	66 (100)
Delayed	Frequency (%)	42 (60.0)	28 (40.0)	70 (100)
Total	Frequency (%)	200 (52.5)	181 (47.5)	381 (100)

WNL: Within normal limit (-1SD < M < +1SD).

Mildly delayed: Risk group of language delay (-1SD ~ -2SD).

Delayed: LD (language delay) (< -2SD).

Table 3. Prevalence of receptive language delay by grade in early years of school children

		1st grade	2nd grade	3rd grade	Total
WNL	Frequency (%)	69 (28.2)	92 (37.6)	84 (34.3)	245 (100)
Mildly delayed	Frequency (%)	23 (34.8)	22 (33.3)	21 (31.8)	66 (100)
Delayed	Frequency (%)	29 (41.4)	23 (32.9)	18 (25.7)	70 (100)
Total	Frequency (%)	121 (31.8)	137 (36.0)	123 (32.3)	381 (100)

WNL: Within normal limit (-1SD < M < +1SD).

Mildly delayed: Risk group of language delay (-1SD ~ -2SD).

Delayed: LD (language delay) (< -2SD).

Table 4. Prevalence of expressive language delay by gender in early years of school children

		Boys	Girls	Total
WNL	Frequency (%)	116 (51.8)	108 (48.2)	224 (100)
Mildly delayed	Frequency (%)	22 (46.8)	25 (53.2)	47 (100)
Delayed	Frequency (%)	18 (47.4)	20 (52.6)	38 (100)
Total	Frequency (%)	156 (50.5)	153 (49.5)	309 (100)

WNL: Within normal limit ($-1SD < M < +1SD$).Mildly delayed: Risk group of language delay ($-1SD \sim 2SD$).Delayed: LD (language delay) ($< -2SD$).**Table 5.** Prevalence of expressive language delay by grade in early years of school children

		1st grade	2nd grade	3rd grade	Total
WNL	Frequency (%)	60 (26.8)	94 (42.0)	70 (31.3)	224 (100)
Mildly delayed	Frequency (%)	18 (38.3)	13 (27.7)	16 (34.0)	47 (100)
Delayed	Frequency (%)	12 (31.6)	13 (34.2)	13 (34.2)	38 (100)
Total	Frequency (%)	90 (29.1)	120 (38.8)	99 (32.0)	309 (100)

WNL: Within normal limit ($-1SD < M < +1SD$).Mildly delayed: Risk group of language delay ($-1SD \sim 2SD$).Delayed: LD (language delay) ($< -2SD$).**Prevalence of speech delay or disorder by gender and grade**

Tables 6 and 7 are cross-tabulation tables showing the frequency distribution of speech disorder diagnoses by gender and grade. The chi-square test results showed no significant difference in the frequency of speech delay diagnoses by gender ($\chi^2(2) = 2.143, p = 0.343$). At the same time, there was a significant difference in speech delay diagnoses by grade level ($\chi^2(4) = 9.788, p = 0.044$).

Comparison of vowel and consonant accuracies based on gender and grade

Table 8 shows the descriptive statistics for the percentage of correct vowels (PCV) and percentage of correct consonants (PCC) by gender and grade level.

For vowel accuracy, the results of a two-way analysis of variance showed that the interaction between gender and grade level was not statistically significant ($F(2, 371) = 0.000, p = 1.000$). There was no main effect of grade level on vowel accuracy ($F(3, 371) = 0.541, p = 0.655$), and there was also no main effect of gender on vowel accuracy ($F(1, 371) = 0.000, p = 0.997$).

In addition, a two-way analysis of variance was conducted to examine the differences in consonant accuracy based on gender and grade level.

As a result of two-way ANOVA, the main effect of gender on

Table 6. Prevalence of speech delay by gender in early years of school children

		Boys	Girls	Total
WNL	Frequency (%)	185 (51.7)	173 (48.3)	358 (100)
Mildly delayed	Frequency (%)	5 (55.6)	4 (44.4)	9 (100)
Delayed	Frequency (%)	10 (71.4)	4 (28.6)	14 (100)
Total	Frequency (%)	200 (52.5)	181 (47.5)	381 (100)

WNL: Within normal limit ($-1SD < M < +1SD$).Mildly delayed: Risk group of speech delay ($-1SD \sim 2SD$).Delayed: SD (speech delay) ($< -2SD$).**Table 7.** Prevalence of speech delay by grade in early years of school children

		1st grade	2nd grade	3rd grade	total
WNL	Frequency (%)	108 (30.2)	129 (36.0)	121 (33.8)	358 (100)
Mildly delayed	Frequency (%)	6 (66.7)	3 (33.3)	0 (0.0)	9 (100)
Delayed	Frequency (%)	7 (50.0)	5 (35.7)	2 (14.3)	14 (100)
Total	Frequency (%)	121 (31.8)	137 (36.0)	123 (32.3)	381 (100)

WNL: Within normal limit ($-1SD < M < +1SD$).Mildly delayed: Risk group of speech delay ($-1SD \sim 2SD$).Delayed: SD (speech delay) ($< -2SD$).**Table 8.** Descriptive statistics of percentage of correct vowels (PCV) & percentage of correct consonants (PCC) based on the gender and grade

Grade	Gender	PCV		PCC	
		Mean (%)	SD (%)	Mean (%)	SD (%)
1st	Boys (N=81)	97.41	5.87	98.82	3.88
	Girls (N=40)	96.25	6.67	99.07	2.57
2nd	Boys (N=58)	98.77	3.81	98.89	3.36
	Girls (N=79)	99.49	2.21	99.71	1.08
3rd	Boys (N=62)	98.69	4.65	99.08	6.56
	Girls (N=61)	99.34	2.50	99.87	0.59
Total	Boys (N=200)	98.19	5.00	98.92	4.72
	Girls (N=181)	98.72	3.96	99.62	1.47
	Total (N=381)	98.44	4.54	99.25	3.58

consonant accuracy was not statistically significant ($F(1, 373) = 2.662, p = 0.104$). The main effect of grade level on consonant accuracy was also not statistically significant ($F(2, 373) = .641, p = 0.527$). Furthermore, the interaction between gender and grade level was not statistically significant ($F(2, 373) = 0.228, p = 0.796$).

DISCUSSION

This study estimates the prevalence of speech and language delay in the early years of elementary school children in South Korea. This topic has yet to be extensively explored in the country.

The current epidemiological cross-sectional study found that 170 children (44.6%) had speech and language delays. This prevalence is considerably higher compared to the rates observed in kindergarten or early years of elementary school children in other countries. Recent estimates of the prevalence of DLD in English-speaking countries indicate that approximately 7% of children aged 4 to 5 years meet the diagnostic criteria, with a higher proportion of males (57-59%) [6,21]. This prevalence will likely decrease in middle childhood (ages 7-9) [11]. The estimates are further classified into receptive language delay (54% and 37% at ages 7 and 9, respectively), expressive language delay (32% and 44% at ages 7 and 9, respectively), and receptive-expressive language deficits (66% and 62% at ages 7 and 9, respectively) [11]. Prevalence estimates for DLD have been reported only in the United States and the United Kingdom, with each study using different diagnostic criteria [8,21]. In the U.S., researchers applied a -1.25 standard deviation cutoff on standardized language tests and a -1.00 standard deviation cutoff on non-verbal intelligence tests (NVIQ), identifying 7.4% ($n=2,009$) of 5-year-old children as meeting the diagnostic criteria. A subsequent U.K.-based study applied a -1.50 standard deviation cutoff on standardized language tests and a -2.00 standard deviation cutoff on NVIQ measurements, identifying 7.6% of 529 children (ages 4-5) as meeting the DLD criteria.

In Brazil, a study conducted between 2002 and 2011 analyzed medical records of preschool and school-age children under 11, investigating the prevalence of language disorders in 524 children [28]. The results showed that male children (68.3%) and those aged 3 to 5 (48.7%) were more prevalent. The most common disorders were phonological disorders (22.9%), orofacial motor system disorders (16.2%), and language disorders (15.1%). Additionally, a higher proportion of male children were diagnosed with language disorders, and an association was found between gender and language diagnosis hypothesis.

Another prevalence study assessed language and/or speech disorders in a representative sample of 5-year-old kindergarten children. The results showed that out of 1,655 children tested, 180 were identified as having a language or speech dis-

order. It is estimated that between 16.2% and 21.8% of the population may experience some form of the disorder, with a prevalence of 15.5% to 20.7% for boys and 19.1% to 25.1% for girls. Additionally, approximately 36% of the identified boys and 30% of the girls only had language issues, while the rest exhibited either speech or language problems [29].

In Saudi Arabia, a prevalence study conducted on 617 children under the age of 7 revealed that children aged 3 to 5 years had a significantly higher prevalence of language delay (112 children, 53.1%). Additionally, there was a significant difference in language delay prevalence between male (170 children, 50.6%) and female (111 children, 39.5%, $p=0.006$) children. A family history of developmental communication disorders was significantly associated with language delay [30]. In a study conducted in India, the prevalence of speech and language delay among children aged 1 to 12 years was 2.53%, which is lower than other previous studies. Medical risk factors included birth asphyxia, seizure disorders, and oro-pharyngeal malformations, while familial factors included low parental education, attachment issues, a positive family history, multilingual environments, and inadequate stimulation [19].

This study yielded different results from international epidemiological studies as the prevalence of articulation disorders was relatively low and no gender differences were found. As the NVIQ requirement was removed due to changes in the DSM-5 criteria for language disorder, the prevalence of language delay was estimated with language standard scores in the current study, regardless of the NVIQ score. Nevertheless, this may be because most epidemiological studies on speech and language disorders include preschool children, while this study focused on school-aged children. Additionally, differences in diagnostic cut-off criteria may have played a role. Even considering these reasons, this study revealed a relatively high prevalence of language delays among early elementary school children in South Korea, with many children exhibiting issues related to receptive and expressive vocabulary development delays. The discrepancy between the prevalence results of this study and other previous studies may be due to different academic year across the countries or the school-based support systems for children with language delay. Follow-up studies involving a larger number of children through cohort studies are needed. These findings highlight the importance of screening at the school level and emphasize the need for early intervention. Additionally, they suggest the need for policies that focus on exerting greater efforts to

identify and intervene with children at risk of language delay. According to a previous study, more than 40% of children who had errors at age 4 continued to show persistent errors at age 7 [13]. This suggests that children with speech delays at age 4 are more likely to resolve the issue, which may justify a “wait-and-see” approach. On the other hand, children with speech disorders at age 4 appear to be at a higher risk for ongoing difficulties, and treatment should be prioritized to mitigate the long-term effects. Therefore, a system should be established within schools to prioritize and provide appropriate assistance at the right time based on the level and severity of speech and language delays.

In addition, elementary school classrooms in South Korea are becoming increasingly diverse, with the growing number of children from multicultural families and an increase in integrated classes where students from special education schools are placed in regular schools. Therefore, schools now include a variety of high-risk children, including general students, who may be at risk for speech and language delays. Schools must employ SLPs to conduct regular speech-language screening tests, identify high-risk children with speech and language delays, and provide timely interventions.

In conclusion, this study is an investigative research on the prevalence of speech and language delay among young elementary school children in South Korea, reporting that numerous children experience clinically meaningful speech and language deficits during the early elementary years. Although the children who participated in this study were from the Busan and Gwangju areas, many participants met the criteria for language and speech delay. The fact that several children with potential speech and language delays in schools highlights the importance of early screening and identifying children who need language intervention. Thus, it is important to identify these children early by including children from various regions. These findings highlight the importance of raising awareness about speech and language delay issues and establishing a foundation for exploring effective intervention and service delivery models for at-risk children. As a result, the placement and training of school-based SLPs should be prioritized in education and health policies.

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