

Risk Factors for Speech Delay in Early Childhood and

Intervention Strategies: A Literature Review

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ABSTRACT

Speech delay is a developmental communication concern in early childhood that may affect children's social interactions, participation in learning activities, and subsequent language development. This study aims to analyze factors associated with speech delay and identify relevant intervention strategies for parents and early childhood educators. A literature review approach was employed to examine scholarly publications addressing children's speech and language development, associated risk factors, and early intervention strategies. The literature was analyzed descriptively and thematically to identify patterns across research findings and their implications for early childhood education. The review indicates that speech delay is associated with multiple biological and developmental factors, including hearing impairments and developmental language difficulties, as well as environmental factors such as limited verbal interaction and insufficient language stimulation. Excessive screen exposure also warrants consideration because of its potential association with reduced opportunities for reciprocal communication.

Relevant intervention strategies include responsive language stimulation, shared book reading, communication-based play activities, developmental monitoring, and collaboration among parents, educators, and healthcare professionals. This review highlights the importance of a multidimensional approach to understanding speech delay and emphasizes the need for early identification and individualized developmental support to promote children's communication and language development.

Introduction

Early childhood represents a critical period for the development of communication and language skills, which contribute to children's cognitive development, social interactions, emotional expression, and learning readiness. During this period, children gradually acquire the ability to understand spoken language, produce meaningful words, construct sentences, and participate in reciprocal communication. These abilities provide an essential foundation for social participation and subsequent educational achievement. However, language development does not progress uniformly across children, and some experience difficulties in acquiring communication skills appropriate to their developmental stage. Norbury et al. (2016) reported that language disorders affect a substantial proportion of children entering formal education, with an estimated prevalence of 7.58% for language disorders of unknown origin in their population-based study in England. This finding highlights the importance of recognizing early

communication difficulties and providing appropriate developmental support.

Speech delay is commonly used to describe slower-than-expected development of spoken communication relative to age-related developmental expectations. Nevertheless, speech and language difficulties should be distinguished conceptually because speech primarily concerns the production of spoken sounds, whereas language involves understanding and using linguistic forms to communicate meaning. Bishop et al. (2017) emphasized the importance of consistent terminology when identifying children's language difficulties, particularly in distinguishing developmental language disorders from language problems associated with identifiable biomedical conditions. Accordingly, speech delay should not be regarded as a single diagnostic condition, as delayed spoken communication may reflect different developmental profiles and underlying difficulties. Understanding these distinctions is essential for parents, early childhood educators, and professionals involved in developmental monitoring.

The development of children's speech and language abilities is associated with multiple interacting factors. Biological and developmental conditions, including hearing impairments, neurodevelopmental difficulties, and limitations in language-processing abilities, may contribute to delayed communication development. Environmental experiences also play an important role in shaping children's opportunities to acquire and practice language.

Consequently, speech delay cannot be adequately explained through a single causal factor. Bishop et al. (2017) distinguished between biomedical conditions, associated risk factors, and co-occurring developmental conditions, emphasizing the complexity of childhood language difficulties. This perspective suggests that identifying possible risk factors requires consideration of children's developmental characteristics alongside the linguistic and social environments in which communication occurs.

The family environment represents an important context for early language development because children acquire communication skills through repeated exposure to meaningful interactions. Responsive communication, conversational exchanges, and opportunities to express needs and ideas contribute to the development of children's communicative competence. In contemporary family environments, however, digital screen exposure has become an additional consideration in understanding children's language experiences. Madigan et al. (2020), through a systematic review and meta-analysis of 42 studies, found that greater quantities of screen use were negatively associated with children's language skills, whereas certain aspects of higher-quality screen use, including educational content and caregiver co-viewing, showed positive associations. These findings suggest that the relationship between screen exposure and language development should be examined in relation to both the duration and context of media use rather than interpreted as a direct causal relationship.

More recent longitudinal evidence has strengthened discussions concerning the relationship between screen exposure and opportunities for verbal interaction. Brushe et al. (2024), in a prospective cohort study involving 220 families with children aged 12–36 months, identified negative associations between screen time and several indicators of parent–child communication, including adult words, child vocalizations, and conversational turns. Their findings suggest that increased screen exposure may coincide with fewer opportunities for reciprocal verbal interaction during early childhood. Nevertheless, these associations require careful interpretation because children's communication development is also influenced by broader familial, developmental, and contextual circumstances. Therefore, understanding speech delay requires attention not only to possible risk factors but also to the quality of everyday communication experiences.

Beyond identifying developmental concerns, appropriate intervention strategies are essential for supporting children who experience speech and language difficulties. Early intervention may involve structured language stimulation, responsive parent–child communication, shared book reading, developmentally appropriate play, and professional assessment when indicated. Roberts and Kaiser (2011), in a meta-analysis of 18 studies, demonstrated that parent-implemented language interventions had positive effects on children's receptive and expressive language skills. Similarly, Noble et al. (2019) found that shared book-reading interventions produced a statistically

significant, although relatively small, overall improvement in children's language development. These findings indicate that interventions should be understood in terms of their specific approaches and documented effectiveness rather than assuming that all language-stimulation activities produce equivalent developmental outcomes.

Despite the growing body of research on childhood language development, evidence concerning speech delay is frequently examined through distinct perspectives, including developmental conditions, family communication, digital media exposure, and language interventions. These perspectives provide valuable insights but also require careful integration to support an understanding of how different risk factors and intervention strategies relate to early childhood education. In the context of early childhood educational practice, teachers and parents need accessible, evidence-informed explanations that distinguish developmental warning signs from possible contributing factors and identify appropriate forms of support. A literature review integrating these dimensions may therefore contribute to a more comprehensive understanding of speech delay and its implications for children, families, and educational settings.

Based on these considerations, this study aims to analyze the biological, developmental, and environmental factors associated with speech delay in early childhood and to examine intervention strategies relevant to parents and early childhood educators. Through a structured narrative review of scholarly literature, the study seeks to synthesize

existing empirical evidence, identify relationships among reported risk factors, and discuss the implications of early identification, language stimulation, and collaborative developmental support. The findings are expected to provide an evidence-informed foundation for understanding speech delay and supporting children's communication development within early childhood educational environments.

Methods

This study employed a qualitative approach using a structured narrative literature review to examine risk factors associated with speech delay in early childhood and relevant intervention strategies. The review drew on 25 scholarly references, comprising empirical studies, review articles, and methodological publications. Of these, 17 studies were organized into a literature review matrix to summarize their research designs, principal findings, and relevance to the research objectives. The literature covered biological and developmental factors, environmental influences, family communication, and early language interventions. The review followed the general principles of narrative literature synthesis outlined by Snyder (2019), emphasizing the relevance and interpretation of existing research evidence.

The literature was analyzed using descriptive and thematic synthesis by comparing findings across the reviewed studies and identifying recurring patterns, similarities, and differences. The analysis was organized into four themes: (1) biological and developmental risk factors, (2) environmental influences and family communication, (3)

developmental and educational implications, and (4) early intervention strategies and parental involvement. These themes provided the analytical framework for discussing the findings and their implications for early childhood education. Consistent with the principles of narrative review quality described by Baethge et al. (2019), the synthesis emphasized evidence-based interpretation while acknowledging differences in research contexts and methodological approaches.

Result and Discussions

The reviewed literature provides evidence that speech delay and related language developmental difficulties in early childhood are associated with multiple biological, developmental, familial, and environmental factors. The studies also identify intervention strategies involving parent–child interaction, language stimulation, shared book reading, and professional developmental support. To facilitate comparison, Table 1 presents 17 additional journal articles in a non-thematic sequence, summarizing their research approaches, principal findings, and relevance to the objectives of this review.

Table 1. Summary of 17 studies related to speech delay, associated risk factors, and intervention strategies

No.	Authors (Year)	Research design	Main findings	Key focus
1	Wan et al. (2025)	Retrospective case-control study	Examined children's language	Screen exposure; parent–child

			developmental delay in relation to parental screen habits, children's screen exposure, and parent-child interaction. The findings support examining these environmental factors together rather than treating screen exposure as an isolated explanation.	interaction
2	Cheung et al. (2022)	Longitudinal study	Examined different word-learning mechanisms in late-talking children. Variation in word-learning processes offers an explanation for differences in	Word learning; developmental differences

			language-development trajectories.	
3	Zuccarini et al. (2020)	Exploratory intervention study	Parent-implemented dialogic book reading was associated with improvements in expressive vocabulary and sentence production among late-talking children, including children born at low-risk preterm gestations.	Parent-led language intervention
4	Hammer et al. (2017)	Population-based longitudinal study	Analysis of approximately 9,600 children identified demographic, birth-related, parenting, and socioeconomic	Risk factors; school readiness

			correlates of late talking. Early limited vocabulary also predicted later difficulties in school readiness.	
5	Karani et al. (2022)	Scoping review	Found that associations between screen use and language development vary with screen-use conditions, parental involvement, and the nature of children's digital experiences.	Screen exposure; parental mediation
6	Dicataldo et al. (2022)	Parent-focused intervention study	Investigated dialogic book reading as an approach to promoting preschool children's language and	Dialogic reading; literacy

			emergent literacy skills through parent involvement.	
7	Calder et al. (2022)	Longitudinal cohort analysis	Identified associations between developmental language disorder at age 10 and several early-life characteristics, including preterm birth and aspects of the home literacy environment.	Biological and family-related risks
8	Meldrum et al. (2025)	Small-scale parent-training feasibility study	Found that parents could be trained to implement a structured word-learning intervention for late-talking toddlers. The study primarily	Parent training; intervention feasibility

			evaluated implementation fidelity and acceptability, not definitive treatment effectiveness.	
9	Romeo et al. (2018)	Observational neuroimaging study	Children's conversational-turn exposure was associated with language-related brain activity and verbal abilities, highlighting the potential importance of reciprocal communication.	Conversational turns; language development
10	Massaroni et al. (2024)	Systematic review	Synthesized 18 studies and reported that prolonged screen exposure during the first years of life may be	Screen time; language acquisition

			negatively associated with children's vocabulary and language comprehension.	
11	Suttora et al. (2021)	Parent-implemented intervention study	An intervention involving dialogic reading and focused stimulation improved aspects of parental responsive language input, which contributed to gains in late talkers' expressive language.	Responsive communication; intervention
12	Armstrong et al. (2017)	Longitudinal cohort study	Identified different childhood language-development trajectories and associations with	Long-term language outcomes

			early family, socioeconomic, and developmental characteristics. Not all children with early language difficulties followed the same developmental pathway.	
13	Roberts (2019)	Randomized pilot trial	Examined parent-implemented communication treatment among infants and toddlers with hearing loss, providing evidence relevant to early communication support in children with an identifiable sensory	Hearing loss; early intervention

			condition.	
14	Ferjan Ramírez et al. (2020)	Randomized controlled trial	Parent coaching increased caregiver use of infant-directed speech and conversational turn-taking, accompanied by improvements in measures of infant language development.	Parent coaching; verbal interaction
15	Kruythoff- Broekman et al. (2019)	Quasi- experimental longitudinal study	Parent- implemented intervention improved expressive vocabulary growth at age three, but group differences were no longer apparent at age four. Continued developmental monitoring	Intervention outcomes; monitoring

			remained important.	
16	Sansavini et al. (2021)	Scoping review	Identified potential early indicators and risk factors for developmental language disorder, including limited vocabulary, weak comprehension, reduced word combinations, and developmental or familial characteristics.	Early identification; developmental risks
17	Nwachukwu et al. (2025)	Systematic review	Reported that frequent passive or unsupervised screen exposure was commonly associated with weaker language outcomes, while interactive and	Digital exposure; language development

			caregiver-supported use may reduce potential disadvantages. The review also noted limitations in evidence certainty.	
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Discussion

Biological and Developmental Risk Factors Associated with Speech Delay

Speech delay in early childhood is associated with various biological and developmental factors, including hearing impairments, premature birth, and differences in language acquisition. Calder et al. (2022) identified relationships between early developmental characteristics and subsequent language difficulties, while Sansavini et al. (2021) highlighted limited vocabulary, delayed word combinations, and difficulties in language comprehension as important developmental indicators. Similarly, Cheung et al. (2022) demonstrated variations in word-learning mechanisms among late-talking children. These findings suggest that speech delay should not be attributed to a single cause. As emphasized by Bishop et al. (2017), developmental language difficulties require careful differentiation based on their underlying characteristics. Therefore, early identification and

appropriate professional assessment are essential for determining children's developmental needs.

Environmental Influences and Family Communication

Environmental conditions, particularly the quality of parent–child communication, play an important role in early language development. Hammer et al. (2017) identified family-related and socioeconomic characteristics associated with late talking, while Romeo et al. (2018) demonstrated associations between conversational exchanges and children's verbal abilities. Digital media exposure is another relevant consideration. Madigan et al. (2020) and Massaroni et al. (2024) reported associations between prolonged screen exposure and poorer language outcomes, whereas Brushe et al. (2024) found that increased screen time was associated with fewer parent–child verbal interactions. However, these findings do not establish a direct causal relationship. Overall, the evidence emphasizes the importance of responsive communication and meaningful verbal interaction in children's everyday environments.

Developmental and Educational Implications

Speech and language difficulties may influence children's social participation, classroom communication, and readiness for formal education. Armstrong et al. (2017) identified variations in children's language-development trajectories, while Hammer et al. (2017) reported associations between early language difficulties and later school readiness. These findings indicate that developmental outcomes may differ across children and that speech delay does not necessarily lead to

persistent educational difficulties. Therefore, early childhood educators should monitor children's communication development, provide inclusive learning opportunities, and collaborate with parents to identify children who may require additional support.

Early Intervention Strategies and Parental Involvement

Early language intervention requires collaboration among parents, educators, and relevant professionals. Roberts and Kaiser (2011) demonstrated positive effects of parent-implemented interventions on children's language development, while Suttora et al. (2021) and Zuccarini et al. (2020) highlighted the benefits of responsive communication and dialogic book reading for late-talking children. Similarly, Ferjan Ramírez et al. (2020) found that parent coaching supported conversational interaction and early language development. Noble et al. (2019) also reported positive, although relatively modest, effects of shared book-reading interventions. These findings support the use of responsive communication, storytelling, and interactive play in home and educational settings. Nevertheless, intervention strategies should be adapted to children's developmental needs and complemented by professional assessment when necessary.

Conclusion

This study concludes that speech delay in early childhood is associated with multiple biological, developmental, and environmental factors, including hearing impairments, language acquisition difficulties, limited verbal interaction, and excessive screen exposure.

These factors may interact and influence children's communication development, highlighting the importance of early identification and appropriate developmental support. The reviewed literature also indicates that responsive parent-child communication, shared book reading, interactive play, and parent-implemented language interventions can support children's language development. Therefore, collaboration among parents, early childhood educators, and healthcare professionals is essential to provide appropriate and individualized support. As a narrative literature review, this study is limited by differences in the research designs and contexts of the reviewed studies. Future research should further examine the effectiveness of early language interventions in Indonesian early childhood educational settings.

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