



Journal name	International e-Journal of Educational Studies
Abbreviation	IEJES
e-ISSN	2602-4241
Founded	2017
Article link	http://doi.org/10.31458/iej.1655247
Article type	Research Article
Received date	10.03.2025
Accepted date	01.05.2025
Publication date	21.07.2025
Volume	9
Issue	20
pp-pp	186-204
Section Editor	Assoc.Prof. Dr. Deniz KAYA
Chief-in-Editor	Prof. Dr. Tamer KUTLUCA
Abstracting & Indexing	Education Source Ultimate Database Coverage List EBSCO Education Full Text Database Coverage List H.W. Wilson Index Copernicus DRJI Harvard Library ASCI SOBIAD
Article Name	Impact of Dyslalia in Early Childhood on Academic Success and Social Skills: A Systematic Review

Author Contribution Statement

¹ **Murat BALCI** 

Assist. Prof.Dr.,
Istanbul Aydin University
Istanbul, Türkiye

Conceptualization, literature review, editing

² **Ruşen MEYLANI** 

Assist. Prof.Dr.,
Dicle University
Diyarbakır, Türkiye

Methodology, data collection, data analysis, writing, editing

³ **Hadiye KÜÇÜKKARAGÖZ** 

Assoc. Prof.Dr.,
Istanbul Aydin University
Istanbul, Türkiye

Conceptualization, literature review, editing

Abstract

Dyslalia, a prevalent speech disorder in early childhood, significantly impacts children's academic success and social skills. This systematic review synthesizes contemporary research to explore these effects and evaluate various interventions. The condition impairs language comprehension, pronunciation, and communication, which are crucial for academic performance, leading to reading, writing, and overall learning challenges. Socially, it hinders peer relationships and emotional expression, contributing to isolation and low self-esteem. The review highlights the importance of early intervention, which mitigates these adverse outcomes by improving language abilities and academic achievement. Moreover, the severity of speech impairment and the timing of intervention are critical determinants of success, with early, intensive support leading to better outcomes. Socially, positive relationships with teachers, parents, and peers are essential, as these connections bolster emotional development. The review also examines various approaches—including speech therapy, music therapy, and technology-based tools—emphasizing the need for multidisciplinary strategies that integrate educational and psychological support. Despite these insights, gaps remain in longitudinal studies, understanding the influence of socioeconomic and cultural contexts, and evaluating the effectiveness of technology-enhanced methods. The findings underscore the necessity of embedding speech services into educational settings and fostering collaboration among educators, therapists, and families to support affected children effectively.

To cite this article:

Balcı, M., Meylani, R., & Küçükkaragöz, H. (2025). Impact of dyslalia in early childhood on academic success and social skills: A systematic review. *International e-Journal of Educational Studies*, 9 (20), 186-204. <https://doi.org/10.31458/iej.1655247>

Copyright © IEJES

IEJES's Publication Ethics and Publication Malpractice Statement are based, in large part, on the guidelines and standards developed by the Committee on Publication Ethics (COPE). This article is available under Creative Commons CC-BY 4.0 license (<https://creativecommons.org/licenses/by/4.0/>)

Review Article**Impact of Dyslalia in Early Childhood on Academic Success and Social Skills: A Systematic Review***Murat BALCI¹  Ruşen MEYLANI²  Hadiye KÜÇÜKKARAGÖZ³ **Abstract**

Dyslalia, a prevalent speech disorder in early childhood, significantly impacts children's academic success and social skills. This systematic review synthesizes contemporary research to explore these effects and evaluate various interventions. The condition impairs language comprehension, pronunciation, and communication, which are crucial for academic performance, leading to reading, writing, and overall learning challenges. Socially, it hinders peer relationships and emotional expression, contributing to isolation and low self-esteem. The review highlights the importance of early intervention, which mitigates these adverse outcomes by improving language abilities and academic achievement. Moreover, the severity of speech impairment and the timing of intervention are critical determinants of success, with early, intensive support leading to better outcomes. Socially, positive relationships with teachers, parents, and peers are essential, as these connections bolster emotional development. The review also examines various approaches—including speech therapy, music therapy, and technology-based tools—emphasizing the need for multidisciplinary strategies that integrate educational and psychological support. Despite these insights, gaps remain in longitudinal studies, understanding the influence of socioeconomic and cultural contexts, and evaluating the effectiveness of technology-enhanced methods. The findings underscore the necessity of embedding speech services into educational settings and fostering collaboration among educators, therapists, and families to support affected children effectively.

Keywords: Dyslalia, speech disorder, academic achievement, social skills, early childhood, speech therapy, language development, intervention strategies

1. INTRODUCTION**1.1. Background and Rationale**

Dyslalia, also known as developmental articulation disorder or articulatory dyspraxia, is characterized by difficulties articulating sounds and accurately forming words (Gómez Pérez et al., 2023). It is a common condition in early childhood, affecting a significant portion of the pediatric population (López-Hernández et al., 2021). Its occurrence is often linked to physiological factors such as temporomandibular disorders, atypical swallowing patterns, and prenatal complications, including neonatal jaundice (Marchesi et al., 2019; Mohorovic et al., 2017). Understanding this speech impairment is critical due to its profound implications for children's academic development and social-emotional functioning.

Received Date: 10/03/2025**Accepted Date:** 01/05/2025**Publication Date:** 21/07/2025

***To cite this article:** Balci, M., Meylani, R., & Küçükkaragöz, H. (2025). Impact of dyslalia in early childhood on academic success and social skills: A systematic review. *International e-Journal of Educational Studies*, 9 (20), 186-204. <https://doi.org/10.31458/iej.1655247>

¹ Assist. Prof.Dr., Istanbul Aydin University, muratbalci@aydin.edu.tr, İstanbul, Türkiye

² Assist. Prof.Dr., Dicle University, rusen.meylani@dicle.edu.tr, Diyarbakır, Türkiye

³ Assoc. Prof.Dr., Istanbul Aydin University, hadiyekucukkaragoz@aydin.edu.tr, İstanbul, Türkiye

Corresponding Author e-mail adress: rusen.meylani@dicle.edu.tr

Speech disorders, particularly those involving articulation challenges, significantly impede a child's communication ability, an essential foundation for social interaction, cognitive growth, and academic learning (Hildebrand et al., 2020). For example, children with such difficulties may struggle to acquire academic language skills, vital for literacy and numeracy in early education (Barnes et al., 2016). These impairments often correlate with limitations in memory, attention, and problem-solving, all of which are integral to cognitive development (Shriberg et al., 2019). Longitudinal studies have shown that early issues with speech sound production may lead to lasting difficulties in both school and social domains (Lewis et al., 2019). Emotional and psychological effects such as frustration, social withdrawal, and low self-worth further emphasize the need for timely and targeted intervention (Gómez Pérez et al., 2023).

Children experiencing articulation disorders often encounter additional challenges due to co-occurring conditions like central auditory processing deficits, further complicating learning and peer engagement (Shaaban, 2021). Some also present difficulties with motor competence, which research has linked to academic achievement and interpersonal skills (Batez et al., 2021). Moreover, social stigma surrounding speech impairments may lead to peer rejection and social exclusion, amplifying feelings of isolation (Kim, 2016).

Given that educational attainment and social integration are foundational to long-term success, it is crucial to investigate how articulation difficulties influence these domains. Academic performance shapes future opportunities and self-concept, while social abilities contribute to peer interactions and emotional resilience (Haapala et al., 2017; Shah et al., 2018). Socioeconomic background also exacerbates the challenges these children face, especially when access to speech services and parental support is limited (Jiang, 2021). These barriers highlight the need for tailored and holistic intervention strategies to address the unique needs of children struggling with early speech difficulties (Fu et al., 2016; Gómez Pérez et al., 2023).

1.2. Research Objectives

This study explores the literature concerning the relationship between early childhood speech disorders, specifically articulation difficulties, and academic performance. It seeks to examine how such speech impairments influence the development of social skills in young children and to identify the range of interventions documented in empirical research. By synthesizing findings from diverse sources, the study endeavors to illuminate effective strategies that support academic and social development in children affected by these communication challenges.

1.3. Research Questions

The following research questions guide this study:

- What is the relationship between early childhood articulation disorders and academic achievement?
- In what ways do speech sound difficulties influence the development of social skills in young children?
- What interventions have been investigated to support affected children's academic and social growth?

1.4. Significance of the Study

This review holds considerable relevance for educators, speech-language therapists, and policymakers. By offering a comprehensive understanding of how articulation disorders affect children's academic and social development, it provides critical insights for designing more effective support systems. For educators, recognizing how these communication challenges influence learning and peer interaction lead to the creation of more inclusive and responsive classroom environments (Wang et al., 2022). Speech-language professionals also benefit from a deeper awareness of practical

and evidence-based intervention strategies, enabling them to tailor therapy approaches to meet each child's specific needs (Hsu et al., 2024). Policymakers, in turn, are urged to integrate language support services and early screening programs into educational systems to ensure equitable access to care (Xie et al., 2022).

The implications extend broadly across early childhood education and intervention programs. A multidisciplinary model that combines speech therapy, academic scaffolding, and social-emotional learning helps establish supportive environments that nurture language development and promote cognitive and interpersonal competencies. Such a holistic framework enhances the overall well-being of children with speech impairments and fosters their long-term academic and social success (Khulusinniyah & Maflaha, 2023).

2. METHODOLOGY

2.1. Search Strategy

The systematic review utilized a comprehensive search strategy to identify relevant studies on the impact of dyslalia in early childhood on academic success and social skills. To gather peer-reviewed literature, the following databases were searched: PubMed, ERIC (Education Resources Information Center), PsycINFO, Web of Science, and Scopus. The search included articles published up to the present year.

The search used a combination of keywords and phrases related to the topic. These included, but were not limited to: "Dyslalia," "Speech disorder," "Articulation disorder," "Early childhood," "Academic achievement," "Social skills," "Peer relationships," and "Speech and language intervention." Boolean operators such as AND, OR, and NOT were used to combine search terms appropriately, ensuring that the search was both broad enough to capture relevant studies and specific enough to exclude irrelevant articles.

188

2.2. Inclusion and Exclusion Criteria

To ensure the relevance and quality of the studies included in this review, the following inclusion and exclusion criteria were applied:

2.2.1. Inclusion Criteria

- *Population:* Studies focusing on children aged 3 to 7 years diagnosed with dyslalia.
- *Outcomes:* Studies examining the impact of dyslalia on academic success (e.g., literacy, numeracy, cognitive development) and/or social skills (e.g., peer relationships, social interaction).
- *Study Design:* Empirical studies, including quantitative (e.g., randomized controlled trials, cohort studies) and qualitative research (e.g., case studies, ethnographic research).
- *Language:* Studies published in English and Turkish.
- *Publication Type:* Peer-reviewed journal articles, conference proceedings, and dissertations.

2.2.2. Exclusion Criteria

- *Population:* Studies focusing on speech disorders other than dyslalia or populations outside the specified age range.
- *Outcomes:* Studies not directly related to academic success or social skills.
- *Study Design:* Reviews, commentaries, theoretical papers, and grey literature.
- *Language:* Studies published in languages other than English or Turkish.
- *Publication Type:* Non-peer-reviewed sources, such as magazine articles and book chapters.

2.3. Data Extraction and Management

The data extraction involved using a standardized form to ensure consistency and comprehensiveness in capturing relevant information from each study. The data extraction form included the following fields:

- Study reference (authors, year, title)
- Study design and methodology
- Sample characteristics (age, gender, location)
- Definition and measurement of dyslalia
- Academic and social outcomes assessed
- Key findings and conclusions

The extracted data were managed using Mendeley's reference management software, and data analysis was conducted using MAXQDA for qualitative synthesis.

2.4. Quality Assessment

The Critical Appraisal Skills Programme (CASP) checklists were employed for qualitative and quantitative studies to assess the quality of the included studies. Each study was evaluated based on the following criteria:

- *Methodological rigor*: Appropriateness of study design, sampling methods, and data collection techniques.
- *Internal validity*: Control of confounding variables, reliability of outcome measures, and appropriateness of statistical analysis.
- *External validity*: Generalizability of the study findings to broader populations.
- *Ethical considerations*: Compliance with ethical standards in research, including informed consent and confidentiality.

Each study was rated as high, medium, or low quality based on these criteria. Only studies rated as high or medium quality were included in the final synthesis.

2.5. Data Synthesis

Data were synthesized using Thematic Analysis and Qualitative Synthesis. For studies that employed qualitative methods, a thematic analysis was conducted to identify common themes and patterns related to the impact of dyslalia on academic success and social skills. This analysis involved coding and categorizing qualitative data to generate overarching themes.

2.6. Handling of Heterogeneity

Given the potential variability in study designs, populations, and outcome measures, heterogeneity was carefully examined. Subgroup analyses were performed to explore differences based on age, gender, dyslalia severity, and intervention type. Sensitivity analyses were also conducted to assess the robustness of the review findings.

This methodology ensured a rigorous and comprehensive approach to synthesizing the existing literature on the impact of dyslalia in early childhood on academic success and social skills, providing valuable insights for educators, speech therapists, and policymakers.

3. FINDINGS AND RESULTS

The main themes and sub-themes emerging from the qualitative analysis and synthesis are depicted in Figure 1.

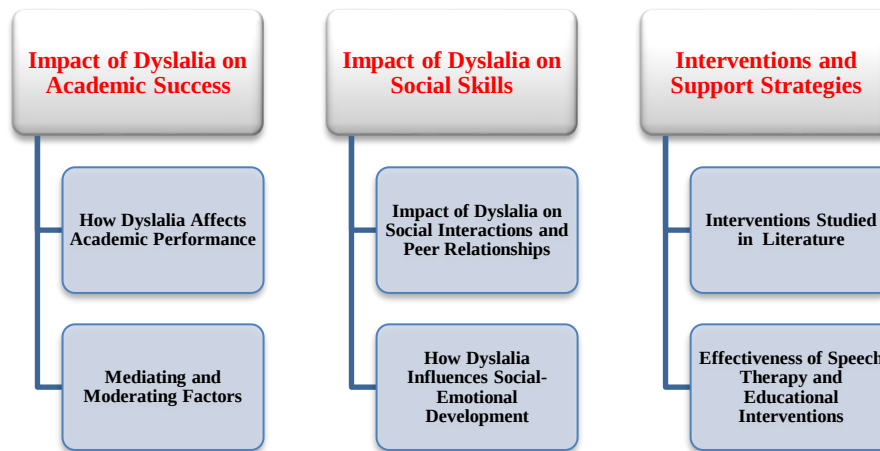


Figure 1. Main themes and sub-themes emerging from the qualitative analysis and synthesis.

On the other hand, Table 1 presents a detailed overview of this research on dyslalia, focusing on its impact on academic success, social skills, and the effectiveness of various interventions.

Table 1. Central themes, sub-themes, and supporting references.

Main Theme	Sub-Theme	Citations	n	%
Impact on Academic Success	How Speech Sound Disorders Affect Academic Performance	Nweze et al. (2021); Vuolo & Goffman (2018); Lewis et al. (2019); Gilbert et al. (2017); Zhao & Yang (2023)	5	13.89%
	Mediating and Moderating Factors	Singla et al. (2021); López-Hernández et al. (2021); Zhao & Yang (2023); Jiang (2021); Gobrial (2019)	5	13.89%
	Impact on Academic Success – Total		10	27.78%
Impact on Social Skills	Social Interactions and Peer Relationships	Zhang & Deng (2022); Estes et al. (2018); Lin et al. (2018); Fink & de Rosnay (2023); Sari et al. (2021)	5	13.89%
	Social-Emotional Development	Kirk & Jay (2018); Troop-Gordon (2015); Sadih et al. (2023); Liu et al. (2023); Šalaj & Masnjak (2022)	5	13.89%
	Impact on Social Skills – Total		10	27.78%
Interventions and Support Strategies	Interventions Studied in Literature	Samuel et al. (2015); Martínez-Vérez et al. (2024); Ekasari (2022); Gómez Pérez et al. (2023); Mora Espinoza et al. (2024); Plantak Vukovac et al. (2016); Elhady et al. (2017); Tenesaca-Tenezaca et al. (2021); Metea (2019)	9	25.00%
	Effectiveness of Speech Therapy and Educational Interventions	Ramírez-Esparza et al. (2017); Scott (2019); Obiweluzo et al. (2021); Burns & O'Connor (2023); Wang et al. (2022); Hsu et al. (2024); Xie et al. (2022)	7	19.44%
	Interventions and Support Strategies – Total		16	44.44%
Grand Total			36	100.00%

3.1. Summary and Interpretation of Table 1

The reviewed studies cluster around three primary themes: academic outcomes, social development, and intervention effectiveness. Each of these is further divided into two balanced sub-themes, reflecting an even distribution of research focus.

3.1.1. Impact on academic success (10 studies, 27.78%)

This theme encompasses how speech articulation challenges influence school performance and which factors may moderate or mediate this relationship.

Academic Performance (13.89%): Five studies, including those by [Nweze et al. \(2021\)](#) and Vuolo and Goffman (2018), explore the direct consequences of speech production difficulties on academic tasks such as reading and writing.

Mediating and Moderating Factors (13.89%): Another five studies, such as those by [Singla et al. \(2021\)](#) and [Jiang \(2021\)](#), investigate the role of variables like socioeconomic status, early intervention, and family support in shaping academic outcomes.

3.1.2. Impact on social skills (10 studies, 27.78%)

This section investigates how communication impairments affect peer interaction and emotional well-being.

Social Interactions and Peer Relationships (13.89%): Studies by [Zhang and Deng \(2022\)](#) and [Estes et al. \(2018\)](#) indicate that children with articulation difficulties often experience challenges forming peer bonds, potentially resulting in social withdrawal.

Social-Emotional Development (13.89%): Research by [Kirk and Jay \(2018\)](#) and [Troop-Gordon \(2015\)](#) suggests that verbal expression difficulties may hinder emotional regulation, self-esteem, and overall social competence.

3.1.3. Interventions and support strategies (16 studies, 44.44%)

This is the most extensively covered area in the literature, highlighting an increasing emphasis on identifying and evaluating treatment approaches.

Interventions Studied in Literature (25.00%): Nine studies, including those by [Samuel et al. \(2015\)](#) and [Mora Espinoza et al. \(2024\)](#), have documented a variety of approaches, from traditional therapy to play-based and technology-enhanced interventions.

Effectiveness of Interventions (19.44%): Seven additional studies evaluate how well these approaches address academic and social deficits (e.g., [Ramírez-Esparza et al., 2017](#); [Hsu et al., 2024](#)).

3.1.4. Overall insights

The highest concentration of studies (44.44%) falls under interventions, reflecting a research trend toward solution-focused inquiry. At the same time, the equally represented academic and social dimensions (27.78% each) point to the multifaceted nature of the condition's impact. These findings underscore the necessity for comprehensive support systems that address speech and affected children's educational and emotional needs.

3.2. Impact of Dyslalia on Academic Success

Speech articulation disorders in early childhood have far-reaching implications for academic development. The connection between verbal communication and school achievement is well-established, as language proficiency supports the acquisition of reading, writing, and general learning skills. Children with such impairments often face difficulties with phonological processing and language comprehension, which impede their ability to perform across multiple academic domains. Beyond these direct effects, indirect influences—such as limited working memory, reduced classroom participation, and emotional distress—compound the challenges these learners experience.

3.2.1. How speech sound disorders affect academic performance

Children with articulation difficulties frequently struggle with the foundational language skills required for academic success. Pronunciation and expressive communication challenges interfere with reading fluency, spelling, and written expression (Nweze et al., 2021). Studies have shown that accurately articulating sounds is closely tied to phonemic awareness, a critical skill for literacy development (Vuolo & Goffman, 2018). When left unaddressed, these issues lead to long-term academic underperformance.

In addition to deficits in language acquisition, such children often experience strain on cognitive resources. Working memory, essential for tasks involving information retention, instruction following, and problem-solving, may be compromised due to the cognitive demands associated with speech planning and execution (Lewis et al., 2019). This cognitive overload hinders performance in both verbal and non-verbal academic activities.

Emotional and psychological consequences also shape academic outcomes. Frustration from communication barriers may lead to disengagement, low motivation, and a reluctance to participate in classroom discussions (Gilbert et al., 2017). These emotional reactions, in turn, reinforce academic avoidance and further isolate the child. Family dynamics also play a role—parents may lack the resources or knowledge to provide adequate support, especially if they struggle to understand the nature and implications of the disorder (Zhao & Yang, 2023).

3.2.2. Mediating and moderating factors

The academic effects of articulation disorders are not uniform; they are influenced by several mediating and moderating variables. One of the most critical is the age at which intervention begins. Research consistently indicates that earlier support improves speech clarity and academic outcomes (Singla et al., 2021). Timely intervention enables children to build communication competence before formal schooling, enhancing their ability to engage with curriculum content.

The severity of speech impairment also acts as a key mediating variable. Children with more pronounced articulation issues may require more prolonged and intensive intervention, and they often encounter more significant obstacles in academic settings (López-Hernández et al., 2021). These children may fall further behind their peers if their challenges are not promptly and thoroughly addressed.

Moderating factors include family involvement, socioeconomic context, and co-occurring conditions. Parental support is crucial in reinforcing language development strategies at home. When families actively participate in the therapeutic process, outcomes improve significantly (Zhao & Yang, 2023). However, disparities in socioeconomic status often determine access to speech therapy and educational resources, creating inequities in outcomes (Jiang, 2021). Furthermore, comorbidities such as cognitive impairments or learning disabilities amplify the effects of speech difficulties. In such cases, children may require specialized interventions that simultaneously target multiple areas of need (Gobrial, 2019).

These mediating and moderating factors underscore the importance of individualized, context-sensitive approaches to intervention and support. The academic trajectories of children with speech articulation disorders are shaped by the condition itself and the support systems surrounding them.

3.3. Impact of Dyslalia on Social Skills

Articulation disorders significantly disrupt children's ability to engage meaningfully in social contexts. Verbal communication is foundational to expressing emotions, initiating and maintaining peer relationships, and participating in group activities. When speech intelligibility is compromised, children often cannot effectively share their thoughts and feelings, reducing social interaction, heightened emotional distress, and challenges in developing age-appropriate social competencies.

3.3.1. Impact on social interactions and peer relationships

Difficulties in sound production and verbal fluency hinder children's ability to initiate conversations and sustain reciprocal communication, placing them at a disadvantage in peer settings (Zhang & Deng, 2022). Effective social interaction depends heavily on clear and confident speech. When this ability is disrupted, children often struggle with misunderstandings, miscommunications, and a limited capacity to respond appropriately during social exchanges (Estes et al., 2018; Lin et al., 2018).

The impact on peer relationships is particularly pronounced. Children with speech challenges may find themselves excluded from group activities or misunderstood by their classmates, which reduces opportunities for friendship formation and collaborative learning (Fink & de Rosnay, 2023). The stigma sometimes associated with speech difficulties intensifies feelings of social rejection and heightens vulnerability to isolation. Over time, these patterns may contribute to diminished self-worth and a reluctance to engage in social environments (Sari et al., 2021).

3.3.2. How dyslalia influences social-emotional development

Verbal communication is also a key tool for emotional expression and self-regulation. Children who cannot articulate their needs and feelings clearly may internalize frustrations, leading to increased emotional dysregulation and social withdrawal (Kirk & Jay, 2018). These emotional difficulties become cyclical, as challenges in expressing emotions reduce the likelihood of receiving appropriate support from peers and adults.

Supportive relationships with teachers and caregivers promote resilience and foster a sense of belonging. Educators sensitive to these learners' communication needs provide scaffolding that builds confidence and encourages classroom participation (Troop-Gordon, 2015). Similarly, emotionally responsive parenting nurtures self-awareness and empathy, essential to social-emotional competence (Liu et al., 2023).

Environmental factors—such as the emotional climate of the classroom, family communication patterns, and the structure of social opportunities—also contribute to how children with speech challenges experience social-emotional development (Sadih et al., 2023). Creating environments emphasizing acceptance, empathy, and collaborative play helps buffer against the social risks associated with articulation disorders.

Additionally, emerging research points to a link between motor coordination and emotional adjustment. Children who experience co-occurring challenges in fine and gross motor skills often demonstrate lower levels of social-emotional functioning (Šalaj & Masnjak, 2022). These physical difficulties may compound the effects of verbal impairment, making it more difficult for children to participate confidently in group activities or demonstrate autonomy. Addressing motor development alongside language support enhances social engagement and emotional resilience.

3.4. Interventions and Support Strategies

Intervention strategies targeting speech sound disorders aim to enhance articulation, phonological awareness, and overall communication skills, supporting children's academic achievement and social development. A growing body of research emphasizes the importance of early, targeted, and often multidisciplinary approaches to mitigate the adverse outcomes of impaired speech.

3.4.1. Interventions studied in literature

Various intervention models have been explored to address articulation difficulties in young learners. Traditional approaches such as supervised and home-based speech therapy remain central. They aim to improve sound production and correct associated swallowing issues, often present alongside speech impairments (Samuel et al., 2015).

Beyond conventional therapy, music-based interventions have shown promise. These approaches enhance memory, attention, and language processing through rhythm and repetition, engaging multiple cognitive systems (Martínez-Vérez et al., 2024). Integral stimulation techniques, which involve modeling and repetition of phonemes, are also frequently employed to improve speech clarity (Ekasari, 2022).

Some programs adopt a holistic framework that targets verbal communication and psychological well-being. For example, interventions that combine articulation work with self-concept enhancement recognize the emotional impact of speech disorders and strive to build children's confidence alongside their linguistic capabilities (Gómez Pérez et al., 2023). Play-based phonological training has also gained traction, especially in early childhood education, for its ability to embed therapeutic practices in joyful, developmentally appropriate contexts (Mora Espinoza et al., 2024).

In recent years, a surge in technology-enhanced strategies has been witnessed. Tools such as educational video content and telerehabilitation platforms allow for remote access to therapy services, addressing barriers related to geography and service availability (Plantak Vukovac et al., 2016). AI-assisted diagnostic and correction tools have also emerged, utilizing machine learning to detect and target misarticulations (Elhady et al., 2017). Interactive applications, including those paired with robotic assistants, are designed to increase engagement while promoting speech development (Tenesaca-Tenezaca et al., 2021).

Furthermore, integrating speech support into broader language therapy programs, especially those emphasizing prevention and early intervention, reflects a growing commitment to embedding communication development within the broader context of childhood education and caregiving (Metea, 2019).

3.4.2. Effectiveness of speech therapy and educational interventions

Multiple studies affirm the effectiveness of clinical and educational interventions in improving academic and social outcomes for children with articulation challenges. For instance, research on parent speech highlights the role of caregiver language input in supporting vocabulary development and long-term communication gains (Ramírez-Esparza et al., 2017). Neurocognitive studies further validate that speech processing engages both language circuits and emotional and social areas of the brain, reinforcing the necessity of addressing speech disorders through holistic interventions (Scott, 2019).

Multimodal therapies—including cognitive-behavioral play therapy and collaborative music therapy—have also effectively reduced social anxiety and improved peer engagement, especially among children who experience communication-related frustration (Burns & O'Connor, 2023; Obiweluozo et al., 2021). These approaches integrate emotional regulation with speech practice, enhancing overall well-being and capacity for social participation.

The reviewed literature consistently emphasizes that early, well-targeted, collaborative interventions are key to positive outcomes. Educators foster inclusive learning environments by incorporating differentiated instruction and social-emotional learning strategies tailored to students with speech-related needs (Wang et al., 2022). Speech therapists benefit from understanding a range of therapeutic modalities, allowing them to personalize interventions that align with the child's linguistic profile and developmental level (Hsu et al., 2024).

Policymakers, in turn, are encouraged to support the integration of communication services within school systems, particularly through universal screening and the development of infrastructure that supports collaboration between educators, therapists, and families (Xie et al., 2022).

4. DISCUSSION

4.1. Discussion of Results

4.1.1. Impact on academic success

Articulation difficulties in early childhood exert a considerable influence on academic development. As language competence forms the foundation of literacy and numeracy skills, children who struggle to produce speech sounds accurately often encounter challenges in reading, writing, and general classroom engagement (Nweze et al., 2021). These issues are further compounded by reduced working memory and cognitive overload during tasks that demand linguistic precision (Vuolo & Goffman, 2018).

Beyond cognitive factors, emotional barriers also arise. Children facing persistent communication challenges may experience frustration, withdrawal, and diminished confidence, undermining motivation and classroom participation (Gilbert et al., 2017). These emotional responses form a secondary barrier to academic success, reinforcing cycles of disengagement. Parental involvement plays a crucial role in this context. However, parents often report difficulties understanding the condition or navigating therapeutic resources, which limit their ability to advocate effectively for their child's needs (Zhao & Yang, 2023).

Literature also underscores the importance of early intervention. Timely therapeutic support significantly improves outcomes in both language acquisition and academic performance (Singla et al., 2021). The severity of the condition further moderates these outcomes—children with more pronounced impairments often require longer-term and more intensive services to achieve educational parity (López-Hernández et al., 2021). Socioeconomic context and comorbid conditions such as learning disabilities serve as additional moderators, shaping access to resources and the complexity of support required (Jiang, 2021; Gobrial, 2019).

4.1.2. Impact on social skills

Speech sound impairments also have a marked effect on social functioning. Effective communication is integral to forming peer relationships, expressing emotions, and participating in collaborative activities. When speech intelligibility is compromised, children may be misunderstood, excluded, or hesitant to engage in social exchanges (Lin et al., 2018; Zhang & Deng, 2022).

Studies show that children with reduced verbal fluency often experience rejection or isolation, negatively affecting their sense of belonging and emotional resilience (Fink & de Rosnay, 2023). This social withdrawal hinders the development of essential interpersonal skills, limiting the child's ability to integrate into group settings or collaborative learning environments.

Social-emotional development is particularly vulnerable to these effects. When children cannot express their feelings or navigate peer dynamics due to communication barriers, they may develop anxiety, low self-esteem, or poor emotional regulation (Kirk & Jay, 2018). Protective factors—such as strong relationships with caregivers and emotionally responsive teachers—play a critical role in buffering against these outcomes (Liu et al., 2023; Troop-Gordon, 2015).

Motor skills also intersect with this domain. Children who present co-occurring difficulties with coordination often experience lower levels of social-emotional competence. These challenges may further restrict participation in physical or group-based activities, deepening feelings of inadequacy and social detachment (Šalaj & Masnjak, 2022).

4.1.3. Interventions and support strategies

The reviewed literature highlights a diverse range of interventions that address speech articulation challenges. Traditional therapy—delivered either in clinical settings or at home—remains a cornerstone, particularly when initiated during early developmental stages (Samuel et al., 2015).

Complementary approaches such as music therapy, phonological games, and integral stimulation techniques enrich these efforts by engaging children in multisensory, developmentally appropriate activities (Ekasari, 2022; Martínez-Vérez et al., 2024).

Technology-enhanced methods offer a promising frontier. AI-driven tools, educational video artifacts, and interactive applications provide scalable, engaging, and often remote access to speech therapy, expanding its reach to underserved populations (Elhady et al., 2017; Plantak Vukovac et al., 2016). These tools also introduce opportunities for individualized feedback, increased repetition, and gamified practice—all supporting learning persistence.

Multidisciplinary strategies that involve collaboration among therapists, educators, and families show the most significant potential. Studies affirm that outcomes improve when support systems extend beyond the therapy room and into classrooms and homes (Metea, 2019; Wang et al., 2022). Moreover, interventions that integrate emotional support, such as cognitive-behavioral play therapy or collaborative music sessions, yield benefits not only in speech development but also in reducing anxiety and enhancing peer engagement (Burns & O'Connor, 2023; Obiweluo et al., 2021).

Overall, research literature reinforces the importance of early, tailored, and context-sensitive interventions. Success is most likely when therapy is embedded within a broader framework, including family engagement, educational accommodations, and attention to the child's emotional and cognitive needs.

4.2. Research Gaps and Future Research Directions

While the current body of literature provides valuable insights into how articulation disorders affect children's academic and social trajectories, several critical gaps remain. Addressing these areas in future research will help develop more equitable, effective, and comprehensive intervention frameworks.

4.2.1. Longitudinal perspectives on long-term outcomes

Most studies have focused on short-term effects, assessing outcomes in preschool and early primary years. However, there is a notable absence of longitudinal research tracking how early speech sound disorders influence developmental outcomes into adolescence and adulthood. Future studies should investigate long-term academic attainment, social integration, emotional well-being, and employability. Understanding how early intervention—or the lack thereof—shapes these life trajectories is vital for informing policy and long-range planning in education and health sectors.

4.2.2. Comprehensive and comparative intervention research

Although a range of therapeutic methods has been explored, comparative studies evaluating their relative effectiveness across contexts are limited. There is a need for robust research comparing traditional approaches with newer, technology-assisted interventions, while also accounting for variables such as intervention intensity, duration, and delivery mode. Multicomponent approaches integrating speech therapy with educational support and psychosocial counseling also warrant systematic evaluation. Such studies would offer practical guidance for professionals selecting and customizing interventions for diverse populations.

4.2.3. Socioeconomic and cultural influences

Cultural context and socioeconomic status are often underrepresented in literature. These factors critically influence access to services, treatment adherence, and parent engagement. Future research should investigate how cultural beliefs about communication and disability affect diagnosis and help-seeking behaviors and how resource disparities shape therapeutic outcomes. By embedding cultural sensitivity into research design, scholars support the development of interventions that are effective but also accessible and acceptable across varied communities.

4.2.4. Technology-enhanced speech support

Digital innovations, including AI-powered tools, speech recognition platforms, and telerehabilitation systems, are gaining momentum but remain under-researched. While preliminary findings are promising, further empirical studies are required to assess these tools' usability, accuracy, engagement value, and long-term effectiveness. Moreover, accessibility issues must be addressed to ensure that digital interventions do not exacerbate existing inequities, particularly among children in under-resourced regions or with limited access to technology.

4.2.5. Comorbidities and intersectionality

Many children with speech production difficulties present with additional developmental challenges, such as auditory processing disorders, motor impairments, or learning disabilities. However, the interactive effects of these comorbidities on academic and social development are rarely explored in depth. Future studies should examine how these overlapping conditions influence the manifestation of speech impairments and the effectiveness of various interventions. Embracing an intersectional perspective will allow researchers to understand the multifaceted needs of affected children better.

4.2.6. Training for parents and educators

Although family and educator involvement has been recognized as critical to successful outcomes, few studies have systematically evaluated training programs designed to build their capacity. Future research should assess the design, delivery, and effectiveness of such programs, especially those that equip stakeholders with practical skills to support communication development at home and in school settings. Additionally, scalable and context-sensitive training models could enhance collaboration between professionals and caregivers, thereby improving continuity of support.

4.3. Recommendations for Policy and Practice

A set of targeted policies and practice recommendations is essential to ensure that children with speech articulation difficulties receive the support they need for successful academic and social development. These recommendations guide education systems, health services, and community organizations toward more inclusive and responsive support structures.

4.3.1. Recommendations for policy

Integrate Communication Support Services into Public Education: National education frameworks should mandate the inclusion of speech and language services within public school systems. This integration enables early identification and consistent intervention without requiring families to navigate fragmented healthcare systems. Dedicated funding must be allocated for hiring qualified speech-language professionals in schools and developing context-specific programs that reflect student populations' linguistic and cultural diversity.

Mandate Early Screening and Referral Mechanisms: Policy initiatives should promote universal screening for speech and language difficulties during early childhood. Educators and pediatric health professionals should receive training to recognize early signs and facilitate timely referrals to specialized services. Implementing screening as a standard practice in preschool and primary settings increases the likelihood of early intervention, yielding better outcomes.

Support Research and Innovation in Intervention Strategies: Government and institutional funding bodies should prioritize research that evaluates diverse intervention models, particularly those that compare traditional and technology-enhanced approaches. Funding should also support longitudinal research and studies examining the influence of cultural, environmental, and socioeconomic factors. Collaborations between academia, technology developers, and public health agencies foster innovative and scalable treatment options.

Address Socioeconomic Disparities in Access: Disparities in access to communication support services remain a persistent concern. Policymakers should work to eliminate financial and logistical barriers by offering subsidized therapy, transportation services, and mobile or remote-based interventions for families in underserved communities. Furthermore, policy frameworks must ensure that services are culturally responsive and linguistically accessible.

4.3.2. Recommendations for practice

Develop Comprehensive Training for Educators: Practitioners should advocate for professional development programs that equip teachers with knowledge and tools to support students with speech production challenges. Training should include strategies for classroom-based language enrichment, early identification of communication difficulties, and coordination with speech-language professionals. Teachers should also be involved in implementing individual support plans and evaluating student progress.

Implement Multidisciplinary, Child-Centered Approaches: Adequate support requires professional collaboration across disciplines. Speech therapists, classroom teachers, school counselors, and psychologists must work together to design and implement individualized, holistic intervention plans. These plans should address speech production and related cognitive, academic, and social-emotional needs. Regular team meetings and shared documentation systems enhance coordination and consistency of care.

Leverage Digital Tools to Expand Access and Engagement: Practitioners should explore using AI-based applications, gamified learning platforms, and teletherapy tools to enhance speech development. These technologies support remote service delivery, reinforce therapy targets at home, and increase motivation and participation. Training for professionals and families on using these tools effectively should accompany their implementation to ensure optimal results.

Encourage Active Family Involvement: Parental engagement strongly predicts intervention success. Therapists and educators should work closely with families to build awareness, share strategies for language support at home, and involve caregivers in goal setting and progress monitoring. Culturally appropriate family workshops and resource kits empower parents to contribute meaningfully to their child's development.

Prioritize Early and Sustained Intervention: Finally, all stakeholders must advocate for intervention that begins as early as possible and is sustained throughout critical developmental periods. If not addressed promptly, speech production issues may persist and interfere with multiple domains of functioning. Practitioners should tailor intervention intensity and content to the child's developmental stage and specific profile of strengths and needs.

5. CONCLUSION

5.1. Summary of Key Findings and Answers to Research Questions

This systematic review explored how early childhood speech articulation disorders influence academic achievement and social development, examining the effectiveness of existing interventions. The following key findings provide direct responses to the research questions:

5.1.1. What is the relationship between early articulation difficulties and academic achievement?

Children with speech disorders often experience significant challenges in academic domains, especially in reading, writing, and oral language tasks. These difficulties stem from reduced phonological awareness, impaired language comprehension, and increased cognitive load during classroom learning. Emotional stress and communication-related frustration may further limit

motivation and classroom participation. Early intervention and the severity of the condition are critical factors influencing academic trajectories. Timely and tailored support is associated with more favorable educational outcomes.

5.1.2. *How do speech production issues influence social skills development?*

Verbal expression is a core component of effective social interaction. Children with reduced speech intelligibility frequently encounter difficulties initiating and maintaining peer relationships, often leading to exclusion, isolation, or diminished self-confidence. The resulting social-emotional difficulties—such as anxiety, poor self-regulation, and low self-esteem—can interfere with the development of critical interpersonal skills. Supportive relationships with teachers, caregivers, and peers mitigate these risks, while co-occurring challenges in motor development may exacerbate social-emotional vulnerability.

5.1.3. *What interventions have been studied to support affected children in academic and social development?*

A broad spectrum of interventions has been explored, including traditional speech therapy, music-based programs, phonological games, and integrative approaches that address communication and psychological well-being. Recent developments in technology-enhanced therapy—such as AI-based tools and telerehabilitation—demonstrate promise in expanding access and engagement. Evidence underscores that the most effective strategies are those initiated early, personalized to the child's profile, and implemented collaboratively across home, school, and clinical contexts. Interventions that include family participation and are delivered through multidisciplinary teams tend to yield the most significant improvements in academic and social domains.

The findings reveal that while speech articulation difficulties pose substantial risks to children's learning and social integration, these risks will be mitigated through early, comprehensive, and contextually responsive support strategies. Addressing the condition's cognitive and emotional dimensions is essential to fostering long-term success.

5.2. **Unique Contributions of the Study**

This systematic review contributes meaningfully to the literature by offering a multi-dimensional synthesis of findings on early childhood speech sound disorders and their impact on academic and social development. The study advances theoretical, methodological, and practical understanding in several distinct ways:

5.2.1. *Theoretical contributions*

Integrating Academic and Social Perspectives: While prior research often treated learning outcomes and peer functioning as separate domains, this review presents an integrated framework highlighting how communication challenges simultaneously influence both. This holistic lens captures the interdependency between language development, emotional well-being, and cognitive performance, reinforcing the need for interventions that target the child as a whole learner.

Identifying Mediating and Moderating Variables: The review outlines various mediating factors (e.g., age at intervention, cognitive functions such as working memory, phonemic awareness) and moderating variables (e.g., parental involvement, socioeconomic status, co-occurring conditions) that shape developmental outcomes. These insights offer a nuanced understanding of how communication difficulties manifest differently across individuals and contexts.

Bridging Speech and Cognitive Development Research: By connecting findings from speech-language pathology with research on cognitive development and educational psychology, the study underscores the broader developmental implications of articulation disorders. It contributes to a

growing recognition that these disorders are not confined to speech alone but are embedded within a complex web of learning, behavior, and identity formation.

5.2.2. Methodological contributions

Comprehensive Thematic Synthesis: This study employs a rigorous systematic review methodology with thematic synthesis, allowing for organizing a large and diverse body of research into clear and actionable themes. Unlike isolated case studies or narrowly scoped meta-analyses, the approach enables broad generalization while preserving detail through sub-thematic analysis.

Comparative Insights on Intervention Models: Few recent reviews have evaluated traditional, behavioral, and technology-based interventions within the same analytical framework. This study offers one of the first comparative syntheses of conventional and digital treatment strategies, facilitating better-informed decision-making among researchers, practitioners, and policymakers.

Highlighting the Lack of Longitudinal and Intersectional Research: This review draws attention to the scarcity of long-term and intersectional research addressing the cumulative impact of communication disorders and their interplay with other developmental challenges. It establishes a foundation for future investigations to understand lifelong implications and the compounding effects of social and economic disparities.

5.2.3. Practical contributions

Emphasizing Early, Contextualized Intervention: The findings underscore the importance of initiating support services early in development and adapting them to the child's specific needs and sociocultural context. This reinforces the need for early screening programs, individualized education plans, and policies facilitating early access to services.

Promoting Multidisciplinary and Collaborative Practice: The study advocates a systemic approach that integrates expertise from educators, speech-language professionals, psychologists, and caregivers. It strengthens the case for cross-sector collaboration and highlights how cohesive, team-based intervention models produce more effective and sustainable outcomes.

Supporting the Integration of Technology in Therapy: This review aligns with ongoing educational technology shifts by analyzing the emerging role of AI, interactive applications, and teletherapy. It provides evidence-based encouragement for leveraging digital tools to extend reach, increase personalization, and enhance engagement, particularly for children in underserved regions.

Offering Actionable Policy and Practice Recommendations: This review's practical recommendations are grounded in empirical evidence and tailored to educators, therapists, and policy stakeholders. They emphasize the alignment of therapeutic services with educational settings and advocate for training programs, equitable access, and inclusive learning environments.

5.3. Limitations of the Study

Despite this systematic review's strengths in synthesizing diverse sources and generating multidimensional insights, several limitations should be acknowledged to contextualize its findings and guide future research efforts.

5.3.1. Limited scope of included studies

The review included a finite number of studies published in English and Turkish, which may have restricted the comprehensiveness of the evidence base. Relevant research published in other languages or less accessible databases may have been excluded, potentially limiting the generalizability of the conclusions. Moreover, the included studies varied in methodological rigor, with some relying on small sample sizes or self-reported measures, which may introduce biases into the synthesized results.

5.3.2. Variation in definitions and diagnostic criteria

Another limitation relates to inconsistencies in how articulation disorders are defined and diagnosed across studies. Terms such as *speech sound disorder*, *articulation impairment*, and *phonological delay* are often used interchangeably, despite reflecting potentially different clinical presentations. This terminological variability complicates cross-study comparisons and may influence how findings are interpreted.

5.3.3. Heterogeneity of intervention approaches

While this review aimed to evaluate a broad range of interventions, differences in treatment models, session durations, delivery formats, and outcome measures across studies pose challenges for direct comparison. Some interventions were embedded in educational contexts, while others were clinical in nature, making it difficult to draw universal conclusions about efficacy. Furthermore, very few studies offered long-term follow-up data, limiting insight into the sustainability of observed improvements.

5.3.4. Limited reporting on sociocultural and contextual variables

Although socioeconomic status, cultural background, and access to services are acknowledged as influential factors, many of the reviewed studies did not report these variables in detail. As a result, it is difficult to assess how contextual factors shape the experiences of children with speech production difficulties or influence the outcomes of interventions. The lack of intersectional analyses reduces the ability to identify at-risk subgroups or evaluate equity-related dimensions of support provision.

5.3.5. Underrepresentation of the child's voice

Few studies included in this review incorporated the perspectives of the children themselves. Most findings were based on reports from teachers, parents, or clinicians. While such perspectives are valuable, they may not fully capture the lived experiences, needs, and agency of the children receiving support. Future research that foregrounds young learners' voices would provide a richer, more authentic understanding of the social and emotional dimensions of communication challenges.

5.4. Final Remarks

This systematic review underscores the multifaceted nature of speech disorders in early childhood and their profound implications for academic and social development. Articulation difficulties, when unaddressed, hinder literacy, classroom participation, emotional well-being, and peer relationships. However, the evidence synthesized in this study also offers a message of hope: with early detection, individualized intervention, and collaborative support structures, affected children make substantial progress and thrive across developmental domains.

The findings highlight the urgent need to embed speech and language services within early childhood education systems and to promote policies that ensure equitable access for all children, regardless of background. They also call attention to the promise of emerging technologies, which, when thoughtfully implemented, enhance therapeutic reach and engagement.

Equally important is the recognition that no single intervention or stakeholder addresses these challenges in isolation. Success lies in coordinated, multidisciplinary efforts involving educators, clinicians, families, and communities working together to support each child's learning journey.

By framing speech production challenges not solely as clinical conditions but as educational and social concerns, this review advocates for an integrated approach to child development that values communication as both a foundational skill and a human right. Continued research, inclusive practice, and responsive policymaking will be key to realizing this vision and ensuring that all children have the opportunity to reach their full potential.

In addition to its theoretical contributions, this systematic review is directly informed by and relevant to the authors' ongoing professional practice in early childhood education and special needs support. The authors actively participate in teacher training and intervention design for children with speech and language difficulties in early education settings. The insights gained through this review guide their evidence-based implementation of inclusive classroom strategies, collaboration with speech-language pathologists, and development of parent engagement models. This alignment ensures that the synthesized findings are not only of academic interest but also directly applied in real-world educational contexts to improve academic and social outcomes for children with dyslalia.

Ethics Committee Decision

Due to the scope and method of the study, ethics committee permission was not required.

5. REFERENCES

- Barnes, E. M., Grifenhagen, J. F., & Dickinson, D. K. (2016). Academic language in early childhood classrooms. *The Reading Teacher*, 70(1), 39–48. <https://doi.org/10.1002/trtr.1463>
- Batez, M., Milošević, Ž., Mikulić, I., Sporiš, G., Mačak, D., & Trajković, N. (2021). Relationship between motor competence, physical fitness, and academic achievement in young school-aged children. *BioMed Research International*, 2021, Article 6631365.
- Burns, J., & O'Connor, R. S. (2023). Exploring clinicians' experiences of engaging in collaborative music therapy and speech and language therapy for children with an acquired brain injury. *Approaches*. <https://doi.org/10.56883/ajmt.2024.37>
- Ekasari, T. (2022). Penerapan metode integral stimulation terhadap pasien Dislalia. *Jurnal Teras Kesehatan*, 5(1), 31–38. <https://doi.org/10.38215/jtkes.v5i1.97>
- Elhady, R., Elmahdy, M., Hamed, I., & Abdennadher, S. (2017). A game with the purpose of automatic detection of children's speech disabilities using limited speech resources. In *Proceedings of the Workshop Natural Language Processing and Information Retrieval* (pp. 28–34). Incoma Ltd. Shoumen, Bulgaria. https://doi.org/10.26615/978-954-452-038-0_004
- Estes, A., Munson, J., John, T. S., Dager, S. R., Rodda, A., Botteron, K., Hazlett, H., Schultz, R. T., Zwaigenbaum, L., Piven, J., Guralnick, M. J., & IBIS network. (2018). Parent support of preschool peer relationships in younger siblings of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 48(4), 1122–1132.
- Fink, E., & de Rosnay, M. (2023). Examining links between affective empathy, cognitive empathy, and peer relationships during school transition. *Social Development*, 32(4), 1208–1226.
- Fu, R., Chen, X., Wang, L., & Yang, F. (2016). Developmental trajectories of academic achievement in Chinese children: Contributions of early social-behavioral functioning. *Journal of Educational Psychology*, 108(7), 1001–1012. <https://doi.org/10.1037/edu0000100>
- Gilbert, L. R., Spears Brown, C., & Mistry, R. S. (2017). Latino immigrant parents' financial stress, depression, and academic involvement predicting child academic success. *Psychology in the Schools*, 54(9), 1202–1215. <https://doi.org/10.1002/pits.22067>
- Gobrial, E. (2019). Comorbid mental health disorders in children and young people with intellectual disabilities and autism spectrum disorders. *Advances in Mental Health and Intellectual Disabilities*, 13(5), 173–181. <https://doi.org/10.1108/AMHID-05-2018-0026>
- Gómez Pérez, I. A., Gallardo-Montes, C. D. P., Ballesta-Claver, J., & Ayllón Blanco, M. F. (2023). Assessing self-concept in children (aged 5–7) with functional dyslalia. *Children*, 10(7), 1238.
- Haapala, E. A., Väistö, J., Lintu, N., Westgate, K., Ekelund, U., Poikkeus, A.-M., Brage, S., & Lakka, T. A. (2017). Physical activity and sedentary time in relation to academic achievement in children. *Journal of Science and Medicine in Sport*, 20(6), 583–589.
- Hildebrand, M. S., Jackson, V. E., Scerri, T. S., Van Reyk, O., Coleman, M., Braden, R. O., ..., & Morgan, A. T. (2020). Severe childhood speech disorder: Gene discovery highlights transcriptional dysregulation. *Neurology*, 94(20), Article e2148–e2167.
- Hsu, W.-C., Fuh, L.-J., & Liao, S.-C. (2024). Tickling the heart: Integrating social emotional learning into medical education to cultivate empathetic, resilient, and holistically developed physicians. *Frontiers in Medicine*, 11, Article 1368858. <https://doi.org/10.3389/fmed.2024.1368858>

- Jiang, Y. (2021). How socio-economic status affects academic performance. *Advances in Social Science, Education and Humanities Research*. <https://doi.org/10.2991/assehr.k.210519.255>
- Khulusinniyah, K., & Maflaha, M. (2023). Improving the social emotional aspect of children through outbound water transfer activities. *Buana Pendidikan Jurnal Fakultas Keguruan dan Ilmu Pendidikan*, 19(1), 61–68. <https://doi.org/10.36456/bp.vol19.no1.a6688>
- Kim, S. J. (2016). The role of peer relationships and interactions in preschool bilingual children's responses to picture books. *Journal of Early Childhood Literacy*, 16(3), 311–337.
- Kirk, G., & Jay, J. (2018). Supporting kindergarten children's social and emotional development: Examining the synergetic role of environments, play, and relationships. *Journal of Research in Childhood Education*, 32(4), 472–485. <https://doi.org/10.1080/02568543.2018.1495671>
- Lewis, B. A., Freebairn, L., Tag, J., Igo, R. P., Ciesla, A., Iyengar, S. K., Stein, C. M., & Taylor, H. G. (2019). Differential long-term outcomes for individuals with histories of preschool speech sound disorders. *American Journal of Speech-Language Pathology*, 28(4), 1582–1596.
- Li, S., Tang, Y., & Zheng, Y. (2023). How the home learning environment contributes to children's social-emotional competence: A moderated mediation model. *Frontiers in Psychology*, 14, Article 1065978. <https://doi.org/10.3389/fpsyg.2023.1065978>
- Lin, Q., Fu, H., Wan, Y., Zhou, N., & Xu, H. (2018). Chinese children's imaginary companions: Relations with peer relationships and social competence. *International Journal of Psychology*, 53(5), 388–396. <https://doi.org/10.1002/ijop.12392>
- Liu, L., Shi, R., Zhai, P., & Wang, M. (2023). Parental harsh discipline and children's anxiety in China: An examination of the moderating and mediating roles of teacher-student relationships and peer relationships. *Psychology of Violence*, 13(6), 497–506.
- López-Hernández, E., Acosta-Rodas, P., Cruz-Cárdenas, J., & Ramos-Galarza, C. (2021). Intervención musicoterapéutica para mejorar la memoria, atención y lenguaje in niños con dislalia. *Revista Ecuatoriana de Neurologia*, 30(2), 48–56. <https://doi.org/10.46997/revecuatneuro30200048>
- Marchesi, A., D'Apote, D., D'Apote, A., Ciancaglini, R., & Strohmenger, L. (2019). The correlation between temporomandibular disorders, atypical swallowing and dyslalia. *International Journal of Oral and Craniofacial Science*, 010–014.
- Martínez-Vérez, V., Gil-Ruiz, P., & Domínguez-Lloria, S. (2024). Interventions through art therapy and music therapy in autism spectrum disorder, ADHD, language disorders, and learning disabilities in pediatric-aged children: A systematic review. *Children*, 11(6), 706. <https://doi.org/10.3390/children11060706>
- Metea, K. (2019). Longitudinal study regarding the frequency of speech disorders at the level of the speech therapy Nicolae Iorga office from Baia Mare. *Revista Română de Terapia Tulburărilor de Limbaj și Comunicare*, 5(1), 50–57. <https://doi.org/10.26744/rrtlc.2019.5.1.08>
- Mohorovic, L., Lavezzi, A., Jonjić, N., Štifter, S., Perry, G., Malatestinić, D., ..., & Petrović, O. (2017). Methemoglobinemia as biomarker and precursor of brain capillary oxidative damage link to ferric iron accumulation and originator of neurodegenerative diseases. *Journal of Systems and Integrative Neuroscience*, 3(5). <https://doi.org/10.15761/JSIN.1000180>
- Mora Espinoza, L. M., Mora Espinoza, C. A., Quintero Espinoza, C. V., Villon Gonzabay, W. O., & Yagual Montoya, V. V. (2024). Playful phonological program to improve functional dyslalia in preschool children. *Universidad Ciencia y Tecnología*, 28(Special), 259–267.
- Nweze, T., Nwoke, M. B., Nwifo, J. I., Aniekwu, R. I., & Lange, F. (2021). Working for the future: Parentally deprived Nigerian children have enhanced working memory ability. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 62(3), 280–288.
- Obiweluozo, P. E., Ede, M. O., Onwurah, C. N., Uzodinma, U. E., Dike, I. C., & Ejiofor, J. N. (2021). Impact of cognitive behavioural play therapy on social anxiety among school children with stuttering deficit: A cluster randomised trial with three months follow-up. *Medicine*, 100(19), Article e24350. <https://doi.org/10.1097/MD.00000000000024350>
- Plantak Vukovac, D., Orehovački, T., & Novosel-Herceg, T. (2016). Inspecting the quality of educational video artefacts employed in speech-language pathology telerehabilitation: A pilot study. In M. Antona, C. Stephanidis (Eds.). *Universal Access in Human-Computer Interaction. Users and Context Diversity* (pp. 480–491). Springer International Publishing.

- Ramírez-Esparza, N., García-Sierra, A., & Kuhl, P. K. (2017). Look who's talking now! Parentese speech, social context, and language development across time. *Frontiers in Psychology*, 8, 1008. <https://doi.org/10.3389/fpsyg.2017.01008>
- Sadiah, T. L., Dewi, S. M., & Nur DS, Y. (2023). Teacher's efforts in improving the social-emotional development of elementary school-aged children. *Gema Wiralodra*, 14(2), 624–628.
- Šalaj, S., & Masnjak, M. (2022). Correlation of motor competence and social-emotional wellbeing in preschool children. *Frontiers in Psychology*, 13, Article 846520.
- Samuel, S. R., Veluswamy, S. K., Maiya, A. G., Fernandes, D. J., & McNeely, M. L. (2015). Exercise-based interventions for cancer survivors in India: A systematic review. *SpringerPlus*, 4(1), 655. <https://doi.org/10.1186/s40064-015-1456-y>
- Sari, N. P., Luijk, M. P. C. M., van Prinzie, P., van IJzendoorn, M. H., & Jansen, P. W. (2021). Children's autistic traits and peer relationships: Do non-verbal IQ and externalizing problems play a role? *Child and Adolescent Psychiatry and Mental Health*, 15(1), 67.
- Scott, S. K. (2019). From speech and talkers to the social world: The neural processing of human spoken language. *Science*, 366(6461), 58–62. <https://doi.org/10.1126/science.aax0288>
- Shaaban, T. S. K. (2021). Impact of central auditory processing disorder (CAPD) on the academic performance of children of early childhood stage: A systematic review and meta-analysis. 21(236), 49-67. <https://doi.org/10.21608/mrk.2021.175446>
- Shah, P. E., Weeks, H. M., Richards, B., & Kaciroti, N. (2018). Early childhood curiosity and kindergarten reading and math academic achievement. *Pediatric Research*, 84(3), 380–386.
- Shriberg, L. D., Strand, E. A., Jakielski, K. J., & Mabie, H. L. (2019). Estimates of the prevalence of speech and motor speech disorders in persons with complex neurodevelopmental disorders. *Clinical Linguistics and Phonetics*, 33(8), 707–736.
- Singla, D. R., MacKinnon, D. P., Fuhr, D. C., Sikander, S., Rahman, A., & Patel, V. (2021). Multiple mediation analysis of the peer-delivered thinking healthy programme for perinatal depression: Findings from two parallel, randomised controlled trials. *The British Journal of Psychiatry*, 218(3), 143–150. <https://doi.org/10.1192/bjp.2019.184>
- Tenesaca-Tenezaca, Ó., León-Pesántez, A., Velásquez-Angamarca, V., & Robles-Bykbaev, V. (2021). FonAPP: An interactive application for the therapeutic intervention of children with dyslalia from embedded devices and robotic assistants. In: Shin, C.S., Di Bucchianico, G., Fukuda, S., Ghim, YG., Montagna, G., Carvalho, C. (eds) *Advances in industrial design*. AHFE 2021. Lecture Notes in Networks and Systems, vol 260. Springer, Cham.
- Troop-Gordon, W. (2015). The role of the classroom teacher in the lives of children victimized by peers. *Child Development Perspectives*, 9(1), 55–60. <https://doi.org/10.1111/cdep.12106>
- Vuolo, J., & Goffman, L. (2018). Language skill mediates the relationship between language load and articulatory variability in children with language and speech sound disorders. *Journal of Speech, Language, and Hearing Research*, 61(12), 3010–3022.
- Wang, W., Xiao, J., Li, W., & Yao, J. (2022). How school climate affects the development of the social and emotional skills of underprivileged-background students-An empirical study based on the sses2019 data. *Children*, 9(12), 1812. <https://doi.org/10.3390/children9121812>
- Xie, S., Wu, D., & Li, H. (2022). The relationship between Chinese teachers' emotional labor, teaching efficacy, and young children's social-emotional development and learning. *Sustainability*, 14(4), 2205. <https://doi.org/10.3390/su14042205>
- Zhang, H., & Deng, C. (2022). The impact of parent-child attachment on school adjustment in left-behind children due to transnational parenting: The mediating role of peer relationships. *International Journal of Environmental Research and Public Health*, 19(12), 6989.
- Zhao, X., & Yang, X. (2023). She succeeded despite lack of ability or resources: Children's consideration of constraint in beliefs and reasoning about academic achievement. *Developmental Psychology*, 59(3), 594–608. <https://doi.org/10.1037/dev0001465>