

Impact of Screen Time on Language and Social Communication Development in Early Childhood: A Systematic Review

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Abstract: Excessive screen time in early childhood has raised concerns regarding its potential impact on language and social communication development. This systematic review aimed to evaluate the association between screen exposure and language and social communication outcomes in children aged 0–60 months. Following PRISMA guidelines, PubMed, ScienceDirect, and Cochrane Library were searched for observational studies published between 2021 and 2025. Studies evaluating screen exposure and language or social communication outcomes in children under 5 years of age were included. Due to substantial heterogeneity among studies, findings were synthesized narratively. Seven cohort and cross-sectional studies from several countries met the inclusion criteria. Overall, greater screen exposure was associated with poorer receptive and expressive language development, reduced communication skills, and impaired social interaction. Higher screen exposure was also associated with fewer caregiver–child conversational interactions and less exposure to language-rich environments. Prolonged screen use, poor-quality content, solitary viewing, and limited parental supervision were additionally associated with poorer developmental outcomes. The findings highlight the importance of limiting screen exposure, promoting age-appropriate and high-quality content, and encouraging responsive caregiver–child interactions to support healthy language development and social communication.

Keywords: Screen time, language development, early childhood, social communication

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Introduction

The rapid growth of digital technology has significantly changed the daily lives of children worldwide. Smartphones, tablets, televisions, and other digital media devices have become increasingly accessible, resulting in greater screen exposure even during early childhood (Varadarajan et al., 2021; Utami and Muthmainnah, 2026). While digital media may provide educational and entertainment benefits, depending on the type, duration, and content, excessive screen time among children has raised concerns about its potential impact on child development, particularly language development (Karani et al., 2021; Zhang et al., 2022). Early childhood is a critical developmental period

during which children acquire receptive and expressive language, communication skills, and social interaction skills through responsive interactions with caregivers and the surrounding environment (Nwachukwu et al. 2025; Utami and Muthmainnah, 2026).

Language development is a fundamental aspect of early childhood growth because it supports cognitive, emotional, academic, and social functioning. Children primarily learn language through direct verbal interaction, shared attention, imitation, and conversational exchange with parents and caregivers. Excessive screen exposure may reduce opportunities for these language-rich interactions by replacing face-to-face communication with passive media consumption

(Brushe et al., 2024; Tripathi et al., 2025). Several studies have suggested that prolonged screen time is associated with speech delay, poorer vocabulary acquisition, reduced conversational interaction, and impaired communication skills in young children (Nwachukwu et al., 2025).

Although numerous studies have investigated the relationship between screen time and child development, findings on language outcomes remain heterogeneous due to differences in study designs, screen exposure measures, and language assessment methods. Furthermore, previous studies have evaluated various aspects of language development, including receptive and expressive language, communication skills, and speech delay, across diverse cultural and socioeconomic settings. Therefore, a comprehensive synthesis of recent evidence is needed to better understand the impact of screen time on language and social communication development during early childhood.

This systematic review aims to evaluate the impact of screen time on language and social communication development in children aged 0–60 months by reviewing observational studies published between 2021 and 2025. The review specifically examines the association between digital media exposure and language-related outcomes, including receptive language, expressive language, speech delay, and communication skills in early childhood.

Materials and Methods

This systematic review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. A comprehensive literature search was performed across three electronic databases: PubMed, ScienceDirect, and the Cochrane Library. Search strategies were tailored to each database using relevant MeSH terms and keywords related to three major domains: exposure to screen-based media (e.g., television, smartphones, and tablets), language and social communication development, and early childhood populations (0–60 months).

The study selection process began by consolidating search results, followed by manually removing duplicate records. We excluded non-English publications, review articles, study protocols, and studies without accessible translations. Eligible articles were subsequently retrieved in full text for final evaluation and qualitative synthesis. The inclusion criteria were as follows: (1) studies reporting outcomes related to the effects of screen time on language development and social communication in early childhood, and (2) articles published between 2021 and

2025. Studies involving children older than 60 months were excluded, and studies whose full texts were inaccessible or unavailable for comprehensive review were excluded.

Due to heterogeneity in study design, screen exposure measurements, and language assessment methods, the findings were synthesized narratively.

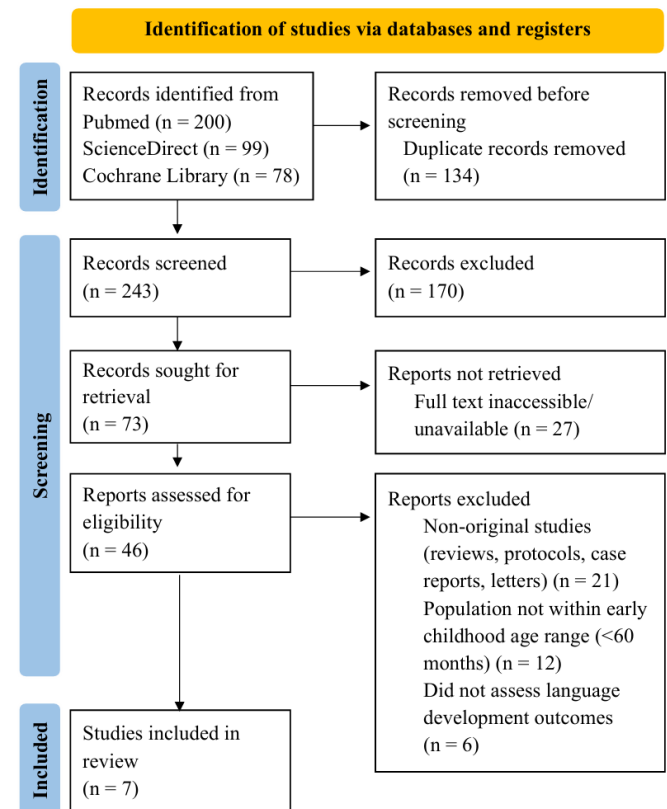


Figure 1. PRISMA search strategy flowchart

Result

The literature search identified 377 articles, of which 7 studies fulfilled the eligibility criteria and were included in the final review. The included studies predominantly used cohort and cross-sectional designs to evaluate the association between screen time exposure and language outcomes in children under 5 years of age.

Methodological quality assessment of the seven included studies was conducted using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist, with instruments selected according to each study's design. The JBI Checklist for Analytical Cross-Sectional Studies was applied to the studies by Dy et al. (2023), Rayce et al. (2024), Tripathi et al. (2025), and Varadarajan et al. (2021), while the JBI Checklist for Cohort Studies was applied to the studies by Brushe et al. (2024), Putnick et al. (2022), and Yamamoto et al. (2023). The assessment

results showed variation in methodological quality among the included studies. Three studies—Varadarajan et al. (2021), Putnick et al. (2022), and Yamamoto et al. (2023)—demonstrated the lowest risk of bias, supported by objective or prospective exposure measurement, comprehensive confounding adjustment strategies, and systematic handling of missing data. Three other studies—Dy et al. (2023), Rayce et al. (2024), and Brushe et al. (2024)—were having moderate risk of bias, primarily due to limitations in the validity of self-reported exposure measures. Meanwhile, the study by Tripathi et al. (2025) was judged to have a higher risk of bias, as it did not report a strategy for handling confounding variables and relied solely on bivariate statistical analysis without multivariate modeling. Nevertheless, the direction of association reported by Tripathi et al. (2025) remained consistent with the findings of the other studies, so this variation in methodological quality serves as an important consideration in interpreting the overall strength of evidence, without altering the general conclusions of this review

Table 1. Studies included in the final review

Study	Design & Participants	Screen Exposure	Main finding
Rayce et al. (2024)	Cross-sectional; 31,125 Danish children aged 2–3 years	Mobile devices, from none to >2 h/day	Screen time ≥ 1 h/day was associated with poorer receptive and expressive language and greater odds of language difficulties.
Brushe et al. (2024)	Prospective cohort; 220 Australian families, children 12–36 months	TV, smartphone, tablet, and other screens	Greater screen exposure was associated with fewer vocalizations, conversational turns, and language-rich interactions.
Yamamoto et al. (2023)	Longitudinal cohort; 57,980 Japanese children aged 0–3 years	TV/DVD viewing	Higher screen time was associated with poorer communication development, with a bidirectional relationship
Putnick et al. (2023)	Prospective longitudinal cohort; 3,894 U.S.	TV, movies, and video games	Greater screen exposure was indirectly associated with

	children, 12–36 months		poorer communication through reduced peer play.
Dy et al. (2023)	Cross-sectional; 419 Filipino children aged 24–36 months	TV, smartphone, tablets, computers	>2 h/day was associated with poorer receptive/expressive language; prolonged and solitary viewing worsened developmental outcomes.
Varadarajan et al. (2021)	Population-based cross-sectional; 718 Indian children <5 years	Smartphones, TV, and digital devices	Excessive screen time was associated with delays in receptive/expressive language, communication, and social interaction.
Tripathi et al. (2025)	Cross-sectional observational; 2,000 Indian children aged 6 months–5 years	Mobile phones, tablets, TV, computers	Excessive exposure, poor-quality content, and lack of supervision were associated with speech delay and poorer language abilities.

A total of seven observational studies published between 2021 and 2025 were included in this systematic review. The studies consisted of cross-sectional and cohort designs conducted across several countries, including Denmark, Australia, Japan, the United States, the Philippines, and India. Overall, the included studies consistently demonstrated that excessive screen time in early childhood was associated with poorer language development outcomes, particularly in receptive language, expressive language, communication skills, and social interaction.

The largest study included in this review was conducted by Yamamoto et al. (2023), involving 57,980 Japanese children aged 0–3 years. Using the ASQ-3 communication domain, the study found that higher television and DVD screen exposure was associated with poorer communication outcomes. Interestingly, the authors also identified a bidirectional relationship, suggesting that children with poorer communication abilities might also be exposed to more screen time. Similarly, Rayce et al. (2024) analyzed 31,125 Danish children aged 2–3 years and reported that mobile device screen time of ≥ 1 hour/day was significantly associated with poorer receptive and expressive language

development, as well as increased odds of language difficulties.

Several studies emphasized the negative impact of screen exposure on expressive language and communication interactions. Brushe et al. (2024), using LENA recordings in Australian children aged 12–36 months, demonstrated that increased exposure to television, smartphones, tablets, and other devices was associated with fewer child vocalizations, reduced conversational turns, and a poorer home language environment. Likewise, Putnick et al. (2023) found that greater screen exposure indirectly impaired communication development through reduced peer play opportunities among U.S. children followed from 12 to 36 months.

The detrimental effects of prolonged screen exposure were also highlighted in studies of Asian populations. Dy et al. (2023) reported that screen time exceeding two hours per day was associated with poorer receptive and expressive language scores in Filipino toddlers aged 24–36 months. Longer durations of exposure (4–5 hours/day) were additionally linked to poorer adaptive and social functioning, while solitary viewing practices produced worse developmental outcomes compared with co-viewing. In India, Varadarajan et al. (2021) demonstrated that excessive screen exposure significantly increased the risk of developmental delay, particularly in receptive language, expressive language, communication, and social interaction domains.

The most recent study included in this review, conducted by Tripathi et al. (2025), provided a more comprehensive evaluation of screen exposure patterns, including duration, content quality, supervision, and contextual usage during meals or bedtime. Among 2,000 Indian children aged 6 months to 5 years, excessive screen exposure, poor-quality content, and lack of parental supervision were all significantly associated with speech delay across age groups. Toddlers aged 1–3 years demonstrated the highest prevalence of speech delay (70%). The study further showed that prolonged exposure was associated not only with poorer receptive and expressive language abilities but also with reduced social interaction, inappropriate language use, and behavioral problems.

Overall, the findings of this systematic review consistently suggest that excessive screen time negatively affects multiple domains of language development during early childhood. The most commonly affected domains were expressive language, receptive language, communication skills, conversational interaction, and broader social communication abilities. Several studies also highlighted that factors beyond duration alone –

including content quality, lack of parental supervision, and solitary viewing practices – may further exacerbate the negative impact of screen exposure on language development. Collectively, the evidence supports current pediatric recommendations advocating limited and supervised screen exposure in children younger than five years old.

Discussion

This systematic review demonstrated a consistent association between excessive screen time and poorer language development outcomes in children under five years of age. Across multiple countries and study designs, higher exposure to digital media was associated with impairments in receptive language, expressive language, communication skills, conversational interaction, and broader social communication abilities, including reduced parent-child interaction.

Brushe et al. (2024) demonstrated that increased screen exposure was associated with fewer conversational turns, reduced child vocalizations, and a less language-rich home environment. Similarly, Putnick et al. (2023) suggested that screen exposure indirectly affected communication development through reduced peer play opportunities. Munamala et al. (2024) also find that excessive screen time can reduce children's social interactions. These findings indicate that screen time may influence language development not only directly through passive media exposure but also indirectly by replacing social interactions essential for language learning. It is recommended to limit screen time and encourage direct social activities such as playing and interacting with peers.

Early childhood represents a period of heightened neuroplasticity and sensitive developmental windows, during which environmental input—particularly social interaction—plays a critical role in shaping cognitive and language development (Fandakoya and Hartley, 2020). Language acquisition occurs primarily through responsive social interaction, including eye contact, shared attention, imitation, emotional attunement, and reciprocal communication with caregivers. Excessive screen exposure may interfere with these developmental processes by replacing human interaction with passive or non-reciprocal digital stimulation. This mechanism was reflected in the findings of Brushe et al. (2024), who reported reduced conversational turns and fewer child vocalizations among children with greater screen exposure. Reduced parent-child interaction may negatively affect not only language acquisition but also emotional bonding, social learning, and the development of self-regulation (Brushe et al., 2024; Dubisettey et al., 2025). Furthermore,

language development is deeply interconnected with social and emotional competence. Proficient language skills enable children to interpret others' intentions, negotiate social relationships, and express their emotions effectively. Consequently, disruptions in early language development may extend beyond communication difficulties, potentially affecting broader aspects of socio-emotional functioning and adaptive behavior (Sari and Arifiyanti, 2025).

Another important finding in this review is the role of environmental and parental factors. Tripathi et al. (2025) demonstrated that poor-quality content, lack of parental supervision, and prolonged exposure were strongly associated with speech delay and behavioral problems. Similarly, Dy et al. (2023) found that solitary viewing produced worse developmental outcomes compared with co-viewing practices. These findings suggest that the impact of screen media is not determined solely by duration but also by the quality of interaction surrounding media use. Parental responsiveness and caregiver engagement are considered protective factors that support healthy emotional and language development. Co-viewing and interactive communication during media exposure may partially mitigate the negative effects of screen use by preserving opportunities for language stimulation and emotional interaction.

The bidirectional relationship identified by Yamamoto et al. (2023) also deserves particular attention. Children with pre-existing communication difficulties may be more likely to receive increased screen exposure because caregivers often use digital devices to calm, entertain, or manage children with developmental challenges. This may create a potentially reinforcing cycle in which communication difficulties increase screen exposure, while excessive screen exposure further limits opportunities for social and language development. From a psychiatric perspective, this highlights the importance of evaluating screen use patterns during developmental and behavioral assessments rather than viewing screen exposure merely as a lifestyle habit.

Early identification of problematic screen use may help clinicians differentiate environmental communication deprivation from primary neurodevelopmental conditions and facilitate timely intervention. Clinicians should evaluate not only the duration of screen use but also the type of content, supervision patterns, co-viewing practices, timing of exposure, and its impact on sleep, behavior, social interaction, and communication development. Early psychoeducation for parents regarding healthy media habits may serve as an important preventive intervention to support optimal neurodevelopment and

reduce the risk of language and social communication difficulties.

This review has several limitations. First, most included studies were observational, limiting causal interpretation. Second, considerable heterogeneity existed regarding screen exposure measurement, language assessment tools, and study populations. Third, many studies relied on parent-reported screen time, which may introduce recall bias. Finally, cultural and socioeconomic differences across countries may influence parenting practices, media exposure patterns, and developmental outcomes. Despite these limitations, the consistency of findings across diverse populations strengthens the evidence that excessive screen exposure is associated with adverse language and communication outcomes during early childhood.

Overall, this systematic review highlights excessive screen time as an important modifiable environmental factor associated with language and social communication development in young children. From a child psychiatry perspective, the findings emphasize the importance of balanced media exposure, responsive caregiving, and early intervention strategies to support healthy neurodevelopment during the critical early years of life.

Conclusion

Excessive screen time in children under five years old is consistently associated with poorer receptive and expressive language development, communication difficulties, and increased risk of speech delay. Factors such as prolonged exposure, poor-quality content, lack of parental supervision, and solitary viewing may worsen these outcomes. From a child psychiatry perspective, excessive screen exposure may interfere with critical early social and language experiences necessary for healthy neurodevelopment. Therefore, limiting screen time, encouraging responsive caregiver-child interaction, and promoting supervised, high-quality media use are important to support optimal language and social development in early childhood.

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