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REVIEW ARTICLES

A scoping review of risk factor analysis influencing speech and language delay in toddler's development

Ayu Kartika Putri, Sri Achadi Nugraheni, Sri Winarni

Author information
Department of Public Health, Universitas Diponegoro, Indonesia

karthika.ayu@gmail.com

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Abstract
Speech and language development in toddlers is a crucial aspect of their overall growth and communication skills. During the early years, children go through significant language development milestones. However, many children in early childhood experience troubles in speech and language. The condition occurs if the children cannot articulate words properly, marked by errors in speech patterns that do not correspond to their age. Risk factors should be explained briefly to help the mother understand and prevent the delay to maximize the intervention. This research analyzes the risk factors influencing speech and language delay in toddlers. This scoping review begins by searching relevant articles with keywords using PRISMA flow as a guideline. Science Direct, Scopus, and PubMed were used for online database searches. The research indicates that risk factors influencing speech and language delay in toddlers include media exposure, male gender, having more than two siblings, lack of interaction in the home environment, housing status, and low parental socioeconomic status. Future research may suggest analyzing the long-term effects of speech and language delay in children.

Keywords: Paediatric care; scoping review; PRISMA; children care; speech and language delay

Introduction

Early childhood is a crucial phase of a child's development as it determines and influences subsequent growth (Safitri, 2017). Furthermore, the first 1000 days from conception to 24 months are particularly important for a child's development because the brain develops rapidly to enhance cognitive, language, and motor skills (Sania et al., 2019). Theoretically, the development consists of gross, fine, socio-emotional, mental, and language skills. Language development is the child's ability to respond to sound and articulation stimulated by biological, cognitive, and environmental factors (Sansavini et al., 2021). Speech is the articulation of verbal expression and language used for communication. Language involves understanding speech, encompassing words and symbols to deliver messages to others. Language consists of receptive language, reflecting the ability to understand words in communication and expressive language, presenting the skill of conveying language verbally and nonverbally to others (Zengin-Akkuş et al., 2018). Speech and language delay was defined as a delay in a child's speaking ability, marked by errors in speech sound patterns that are inappropriate for their age (Sunderajan, 2019). The delay occurs when a child communicates less effectively compared to peers of the same age due to limitations in their language and comprehension skills (Kumar et al., 2022). In 2016, the prevalence of speech and language delay among Canadian toddlers was 12.6% (Collisson et al., 2016). In Thailand, 40.9% of toddlers are suspected to experience speech and language delays (Rithipukdee & Kusol, 2022). In addition, many children in Indonesia aged 2 to 6 years have speech and language delays (Kumar et al., 2022). The prevalence of speech and language delay in Indonesian toddlers ranges from 5% to 10%, with an incidence rate of 2.3% to 24% (Safitri, 2017). The phenomenon is caused by parental social status and engagement in communicating with their children (Feldman, 2019). Also, household is another environmental factor affecting communication, which delays the number of siblings in a family (Guralnick, 2013; Henrichs et al., 2011).

Several studies have reported issues of speech and language delay in various designs. A study highlighted that factors affecting speech and language delay are interacting with television for more than two hours daily and the mother's education level (Weerakul, 2019). Previous research has focused only on speech and language delay risk factors in 5-year-old children (Wallace et al., 2015). When left untreated, delays in language development can affect

personal social life and cause difficulties in children's learning, which later interferes with the development process (Lyons R. (2021). The children's acquisition of speech and language is a sign of children's overall development and intellect (Sunderajan, 2019).

The improvement of children's ability to distinguish sounds starts at six months, from 1.5 years to 3 years, followed by the development of word interconnection and concerning lexical resources (Roberts et al., 2019). Some children's speech and language development may be slower than others, indicating speech and language delay (Tan, 2019). Parents should pay attention to their children's speech and language development by knowing early identification as the intervention of communication delays to minimize the effect of the delay on educational and social outcomes (J van der Linde et al., 2016). Identifying factors impacting speech and language delay before children enter school is essential so as not to interfere with formal education because communication ability is fundamental to human interaction and learning (Rudolph, 2017). However, the risk factors for toddler speech and language delay are unclear and unexplored in the literature. The nurse's role is to raise awareness among the parents about the importance of language development. Nurses can assist parents in detecting speech and language delays in toddlers by showing normal language development and explaining signs of speech and language delay in children. Therefore, nurses need to learn about the risk factors for speech and language delay in children early to educate, supervise, and encourage parents to help their children repair and improve their speech and language development. The study provides an overview of the risk factors influencing speech and language delay in toddlers' development in a specific country and worldwide, specifically in toddlers aged 24 months to 48 months. Subsequently, this research can serve as a reference for future research and nurses addressing language development issues in children.

Method

The study used a scoping review design to examine the risk factors influencing speech and language delay among toddlers. This design is a powerful tool for researchers, practitioners, and policymakers to understand the current state of knowledge on a topic, identify gaps and inconsistencies in the literature, and guide future research and decision-making processes. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram was used as a guideline to collect relevant articles and select sources that indicate the evidence. The flow diagram provides a transparent and comprehensive overview of the study selection process in systematic reviews and meta-analyses. This flow diagram enhances the clarity and reproducibility of the evaluation by visually depicting each stage of the study selection process, from initial database searches to the final inclusion of studies. By clearly documenting the number of records identified, screened, deemed eligible, and ultimately included in the review, the PRISMA flow diagram helps readers understand how many studies were excluded at each stage and for what reasons. Science Direct, Scopus, and PubMed were used for online database searches. The keywords used were ("risk factor" AND "speech delay" OR "late-talking" OR "late talker" AND "language delay" AND "toddler" AND "development"). All literature was limited to open-access articles and English studies published from 2013 to 2023, and it discussed speech and language delays. Meanwhile, the exclusion criteria were articles that did not discuss speech and language delay among toddlers.

Results

During the search process, the authors gained 1894 articles in databases. These articles were screened by searching for duplicates automatically using the Mendeley Desktop, discovering 32 duplicate articles. Of these publications, 1799 pieces were excluded after initially screening titles and abstracts. The relevant articles were assessed for their eligibility about 63 articles. Unfortunately, 51 articles were excluded due to articles that didn't meet the inclusion criteria, comprising nine publications other than research articles, 23 articles that were not open access, and 19 articles discussing risk factors influencing speech and language delay in children beyond toddler age **(Figure 1)**. Finally, twelve articles were included in the study's final analysis **(Table 1)**.

Discussion

This review highlighted that speech and language delay in toddlers was caused by media exposure (Tan et al., 2019; Rithipukdee & Kusol, 2022; Lin et al., 2015; Zengin-Akkuş et al., 2018; Byeon & Hong, 2015). Media exposure to gadgets and television for more than 2 hours per day is a risk factor for delayed speech and language development in toddlers (Tan et al., 2019; Rithipukdee & Kusol, 2022). The risk of language delay in children increased proportionately to the increase in television watching time (Zimmerman et al., 2007). Children who watch television overmuch can reduce their time in physical activity. Children became less likely to hone their motor skills by the time they spent time watching television excessively. A toddler who is exposed to media such as gadgets and television can worsen their

process of language acquisition and reduce the quantity and quality of time in the interaction between toddlers and parents (Muppalla, Vuppalapati, Reddy Pulliahgaru, & Sreenivasulu, 2023). Gadgets can reduce concentration in children, making it difficult for them to learn. Besides, radiation on gadgets can damage nerves and brain tissue, reducing children's active power, so children's growth and development are hampered (Aurelia et al., 2022).

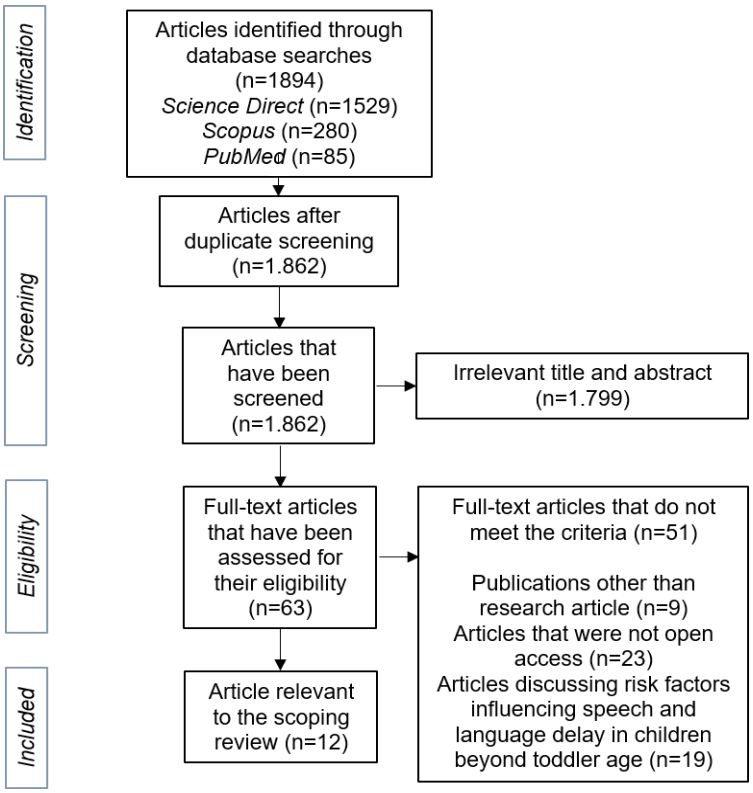

Figure 1. Study selection process.

The three included research articles indicate that the male gender affected speech and language delay in toddlers (Zaib et al., 2022; Collisson et al., 2016; Hammer et al., 2017). Gender is one of the factors that bring over language development. Speech delay generally ensues three times more in boys than girls (Campbell et al., 2003). The biological factor that could predict poor language comprehension in 36-month-old children is the male gender (Korpilahti et al., 2016). The condition of speech delays occurring more in boys than girls is related to the maturation of women in the brain part of the left hemisphere. Verbal function is better than in men, and the development of the right hemisphere is better for abstract tasks and requires skills. Risk factors for speech and language delay in toddlers are significantly affected by the number of siblings (J van der Linde et al., 2016; Jeannie van der Linde et al., 2015; (Hammer et al., 2017). Children who have two or more siblings are at risk for communication delays (Zubrick et al., 2007). Large families with many members imply that parents' interaction and attention can be divided among children. Parents with more than two children in their home cause a lack of attention to the children compared to parents who only have one or two children (Georgan, Archibald, & Hogan, 2023). The number of children in a family causes parents to pay less attention to providing training and examples of good language to children, so children's language development tends to experience stagnation or abnormalities such as not being clear in expressing words, fear of expressing opinions and stuttering in speaking.

Low communication and interaction between parents and toddlers increase the risk of speech and language delay (Tan et al., 2019; Hammer et al., 2017; Zengin-Akkuş et al., 2018). Children with delayed speech development have poorer social interactions than children with everyday speech and language development (Rice, Sell, & Hadley, 1991). All toddlers who have normal speech development show that they have good social interactions with their surroundings. Parenting could affect language development, with low stimulation and parental attention increasing the risk of speech delay in children (Hammer et al., 2017; Zimmerman et al., 2007).

Table 1. Study finding.

Authors	Metode	Findings
Tan et al., 2019, Byeon & Hong, 2015; Lin et al., 2015; Zengin-Akkuş et al., 2018	Case-control study	Watching TV (> 2 hours a day) and poor social interaction.
J van der Linde et al., 2016; Jeannie van der Linde et al., 2015	Cross-sectional study	The number of siblings and housing status.
Rithipukdee & Kusol, 2022	Cross-sectional study	Social media use (>2 hours a day).
Zaib et al., 2022	Cross-sectional study	Gender.
Korpilahti et al., 2016	Cohort study	Gender and father's status.
Collisson et al., 2016; Tseng et al., 2023	Cohort study	Male.
Hammer et al., 2017	Cohort study	Socioeconomic parents' status, siblings, and lack of attention.

Nurses can stimulate children's language development by providing methods such as playing together, playing hand puppets, and telling stories to improve communication skills in children. Two included articles imply that toddlers who only lived with their parents are more at risk of speech and language delay than toddlers who lived with others (Jeannie van der Linde et al., 2015; J van der Linde et al., 2016). Toddlers who lived and socialized around their neighbourhood showed a lower prevalence of language delay at 10% compared to toddlers who only lived with their parents or caregivers in their home at 21%. A complex and diverse environment will indirectly create social learning within interaction toward toddler's development (Howard et al., 2014). Toddlers who live close to their neighbourhoods can help with the social and communication development of children (Samuels et al., 2012). Family socioeconomic status is one of the leading indicators of children's language development. Low lexical ability in 36-month-old toddlers comes from the father's low social class. The child had a more extensive vocabulary during the early developmental years if the father was out of work than if the father was working outside the home all day. The mother's low social status affects children's low language comprehension skills (Korpilahti et al., 2016). Education involves a person's social status. Generally, parents with higher education are better at receiving knowledge and information, so they know better to educate children about their thinking patterns. Low parental socioeconomic status increases the risk of speech delay in 24-month-old children (Hammer et al., 2017). The poor working conditions of the parents involved in a low economic situation will harm child development (Hackman & Farah, 2009).

Conclusion

This review of twelve articles shows that media exposure, gender, number of siblings, interaction in a home environment, housing status, and parental social status are the risk factors for speech and language delay in a toddler's development. This information may be used to identify those who need early intervention for communication delays, and the nurses can educate, supervise, and encourage parents to improve their children's speech and language abilities. Nurses can act as educators, especially the problem of gadget addiction in toddlers, by assisting families in organizing schedules for gadget use and providing knowledge about the adverse effects of excessive gadget use on children. Future studies are still needed to analyze the long-term impact of speech and language delay in toddler on their language development toward adulthood.

Author's declaration

The authors made substantial contributions to the conception and design of the study and are responsible for data analysis, interpretation, and discussion of results. For manuscript preparation, all authors read and approved the final version of this article.

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Availability of data and materials
All data are available from the authors.

Competing interests
The authors declare no competing interest.

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