

Lexical development and stuttering in children: a scope review

Desenvolvimento lexical e gagueira na criança: revisão de escopo

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ABSTRACT

Purpose: to search and analyze publications that address the relationship between lexical ability and stuttering in children aged 2 to 9 years old. **Research strategy:** search in Cochrane Library, MEDLINE via PubMed, Scopus, Web of Science, EMBASE databases. **Selection criteria:** comparative, longitudinal or case-control clinical studies that included analysis of the expressive and receptive vocabulary of children with stuttering aged between 2 and 9 years. **Results:** most of the analyzed studies report a relationship between lexical development or performance and stuttering in children, however there is no consensus about the relationship between greater or lesser lexical development. **Conclusion:** there is not enough evidence to relate stuttering and lexical development. More studies are needed in order to understand the relationship between lexical performance and stuttering in children.

Keywords: Stuttering; Childhood-onset fluency disorder; Language development; Child language; Vocabulary; Semantics; Child

RESUMO

Objetivo: mapear as publicações que abordam a relação entre habilidade lexical e gagueira em crianças na faixa etária dos 2 anos aos 9 anos. **Estratégia de pesquisa:** busca nas bases de dados Cochrane Library, MEDLINE, via PubMed, Scopus, Web of Science, Embase. **Crerios de seleço:** estudos clínicos comparativos, longitudinais ou caso-controle, que incluíam análise do vocabulário expressivo e receptivo de crianças com gagueira na faixa etária de 2 a 9 anos. **Análise dos dados:** após a busca inicial com 426 artigos, 42 foram selecionados para leitura na íntegra, dos quais, 16 atenderam aos critérios de elegibilidade. **Resultados:** a maior parte dos registros analisados referiu haver relação entre desenvolvimento ou desempenho lexical e gagueira em crianças. No entanto não houve consenso sobre a relação entre maior ou menor desenvolvimento lexical. **Conclusão:** o mapeamento dos estudos incluídos indicou que não há evidências suficientes que relacionem gagueira e desenvolvimento lexical.

Palavras-chave: Gagueira; Transtorno da fluência com início na infância; Desenvolvimento da linguagem; Linguagem infantil; Vocabulário; Semântica; Criança

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INTRODUCTION

Developmental stuttering is a universal chronic disorder that begins in childhood, more frequently around 2 years and 6 months old, in the phase of greater language development when vocabulary increases and they begin to form their first sentences and accompanies the person throughout their lives⁽¹⁻⁴⁾.

The incidence of stuttering in childhood is estimated at 5% of the population, of whom approximately 80% recover. The typical age of symptom onset is between 30 and 48 months old, with a mean of 33 months⁽⁴⁻⁶⁾. It is estimated that 5% to 8% of preschoolers undergo a phase of stuttering, with a proportion of 1.5:1 boys to girls⁽⁴⁻⁶⁾. About 80% of children recover, and the prevalence of stuttering in adulthood is approximately 1% of the world population, with a proportion of 4:1 men to women^(5,6).

The language and its aspects are heterogeneous factors in their relationship with stuttering. A stuttering child may have adequate language development and a less developed speech-motor system, while another one may have linguistic and articulatory inabilities that interact with a motor system that is not mature for speech. Moreover, both will have speech disfluencies that may or may not have different characteristics and frequencies⁽⁷⁾.

Some authors^(7,8) believe that stuttering children are less proficient in certain language parameters than their non-stuttering peers. Others ponder that there is not enough evidence to state that stuttering children's linguistic skills fall short of those of other children⁽⁹⁾.

This study conducted a scoping review to map how lexical skills are considered as facilitators to maintain or recover from stuttering symptoms in preschool and school-age children up to 9 years old.

Developmental stuttering, which begins in early childhood and continues throughout the person's lifetime, is associated with a high spontaneous recovery index in preschoolers. Approximately 80% of children who begin stuttering recover spontaneously 6 to 8 months after its onset – which is known as recovered stuttering⁽¹⁰⁻¹²⁾. However, psychosocial, emotional, and occupational consequences may be quite significant in individuals whose disfluency persists⁽¹¹⁻¹²⁾.

In a prospective cohort study, the stuttering recovery rate at 7 years old was 65%. Girls who by 2 years old had high linguistic performance skills had a higher recovery rate, unlike the boys. Moreover, children who recovered from stuttering had more developed linguistic skills than those with persistent stuttering. Thus, the authors considered linguistic skills at 2 years old as predictive factors for recovered stuttering analyzed at 7 years old – girls with higher test scores had a higher recovery rate, whereas boys with higher expressive vocabulary indices at 2 years old had lower recovery rates. Language skills at 7 years old were normal in both girls and boys, although the children who recovered had more developed language skills than those in whom stuttering persisted. However, the study did not report which skills are considered predictive of persistence or recovery⁽¹³⁾.

OBJECTIVE

This study aimed to map publications that approach the relationship between lexical skills and stuttering in children aged 2 to 9 years.

RESEARCH STRATEGIES

This scoping review was developed according to the methodology proposed by the Joanna Briggs Institute (JBI)⁽¹⁴⁾. Scoping reviews have a rigorous and transparent methodology and have been widely used in the field of health. Firstly, the research question was defined as follows: “What are the characteristics of lexical development in 2-to-9-year-old children diagnosed with stuttering?”

The search included studies that addressed children diagnosed with stuttering with or without comparison groups and used or cited linguistic performance assessments that included receptive and expressive vocabulary tests.

SELECTION CRITERIA

The PCC mnemonic (Population, Concept, and Context)⁽¹⁴⁾ guided the search for relevant studies, defined as follows: a) Population: children aged 2 to 9 years, diagnosed with stuttering; b) Concept: lexical development; c) Context: any assessment setting, such as clinics, schools, offices, and homes. Thus, the search included studies whose populations were 2 to 9 years old, diagnosed with stuttering, with no complaints related to intellectual disability, neuromotor dysfunction, attention deficit/hyperactivity disorder, autism spectrum disorder, Down syndrome, or other cognitive changes. The concepts approached in the studies should include lexical development, lexical skill, receptive and/or expressive vocabulary, lexical access, and lexical-semantic development. Regarding the concept, studies that approached phonological deviation, apraxia, specific language changes, and written language changes were excluded. The search also involved studies that considered assessments, therapy, or monitoring. The review excluded those that addressed clinical cases, review articles, health prevention and promotion, studies that did not assess lexical skills, and clinical considerations. Moreover, the inclusion criteria considered articles published in full text in Portuguese, English, and Spanish.

Scientific articles were searched to find content on lexical development or skills related to stuttering in children in the said age range. Hence, the review included quantitative and qualitative studies, with no restriction on time. The Rayyan software⁽¹⁵⁾ was used to select, include, and exclude articles for this study retrieved from the following databases: Cochrane Library, Scopus, Web of Science, EMBASE (via CAPES portal), and MEDLINE (via PubMed). The initial search for articles began in April 2022 and finished in July 2022. The search strategies are shown in Chart 1.

Two authors initially selected articles independently, using Rayyan, and removing duplicates. Two authors selected potentially relevant publications based on the titles and abstracts identified in the database search, according to the inclusion and exclusion criteria. Another two authors performed a new selection, solving

Chart 1. Database search strategies

| DATABASE | STRATEGY |
|---|--|
| VHL (Virtual Health Library) | (Gagueira OR stuttering OR tartamudeo OR bégaiement OR “Transtorno da Fluência com Início na Infância” OR “Childhood-Onset Fluency Disorder” OR “Trastorno de Fluidez de Início en la Infancia” OR “Trouble de la fluence verbale débutant dans l'enfance” OR “Distúrbio da Fluência com Início na Infância” OR stammering) AND (“Desenvolvimento da Linguagem” OR “Language Development” OR “Desarrollo del Lenguaje” OR “Développement du langage oral” OR “Aquisição da Linguagem” OR “Linguagem Infantil” OR “Child Language” OR “Lenguaje Infantil” OR “Langage de l'enfant” OR “Linguagem da Criança” OR vocabulário OR vocabulary OR vocabulario OR vocabulaire OR semântica OR semantics OR semántica OR sémantique OR “Desenvolvimento Lexical” OR “Lexical Development” OR “Language Acquisition”) AND (criança OR child OR niño OR enfant OR crianças OR pré-escolar OR “Child, Preschool” OR preescolar OR “Enfant d'âge préscolaire” OR “Criança Pré-Escolar” OR “Crianças Pré-Escolares” OR “Pré-Escolares” OR children OR “Preschool Child” OR “Preschool Children”) AND (db:(“LILACS” OR “IBECs” OR “INDEXPSI” OR “BBO” OR “BINACIS” OR “CUMED” OR “SOF” OR “campusvirtualsp_brasil”)) |
| MEDLINE (via PubMed) | (Stuttering OR “Childhood-Onset Fluency Disorder” OR Stammering) AND (“Language Development” OR “Child Language” OR Vocabulary OR Semantics OR “Lexical Development” OR “Language Acquisition”) AND (Child OR “Child, Preschool” OR Children OR “Preschool Child” OR “Preschool Children”) |
| Cochrane (via CAPES Portal) | (Stuttering OR “Childhood-Onset Fluency Disorder” OR Stammering) AND (“Language Development” OR “Child Language” OR Vocabulary OR Semantics OR “Lexical Development” OR “Language Acquisition”) AND (Child OR “Child, Preschool” OR Children OR “Preschool Child” OR “Preschool Children”) |
| Scopus (via CAPES Portal) | (Stuttering OR “Childhood-Onset Fluency Disorder” OR Stammering) AND (“Language Development” OR “Child Language” OR Vocabulary OR Semantics OR “Lexical Development” OR “Language Acquisition”) AND (Child OR “Child, Preschool” OR Children OR “Preschool Child” OR “Preschool Children”) |
| Web of Science (via CAPES Portal) | (Stuttering OR “Childhood-Onset Fluency Disorder” OR Stammering) AND (“Language Development” OR “Child Language” OR Vocabulary OR Semantics OR “Lexical Development” OR “Language Acquisition”) AND (Child OR “Child, Preschool” OR Children OR “Preschool Child” OR “Preschool Children”) |
| EMBASE (via CAPES Portal) | (Stuttering or ‘fluency disorder’) AND (‘language development’ or vocabulary or semantics or ‘lexical development’) AND (‘preschool child’ or child) |

divergences by consensus. Data extracted from the selected studies included their objectives/research questions, methods, results, participants, and suggestions regarding the study object.

DATA ANALYSIS

The results were organized in the following categories to summarize the findings: authors and year of publication, total n ($n = 2,515$), n included in the research (604 children diagnosed with stuttering and 1,786 children without stuttering in the control groups), characterization of research groups, and main lexical development findings (Table 1). This review was reported following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) – Extension for Scoping Reviews⁽¹⁶⁾.

The initial search included 426 articles, of which 385 were excluded for being duplicates (331 articles) or by their titles and abstracts (53 articles). Hence, 42 remained. The authors had diverged about 15 of these articles; after discussing them, they were included for full-text reading. Thus, 42 articles were read in full text, of which 16 were selected as they met the inclusion criteria. The process of selecting studies for this scoping review is shown in Figure 1.

RESULTS

The review included 16 studies that reported the language assessment of 2,515 children aged 2 to 9 years, all of them from English-speaking countries such as Australia and the United States. The 16 selected studies were articles published in scientific journals. Table 1 presents the studies included in the review, the study type, the year of publication, and the main results.

Two of the records, which were review articles^(17,18), were not included in the total sample, one of them due to meta-analysis⁽¹⁸⁾. The selected studies included four longitudinal ones⁽¹⁹⁻²²⁾, of which two^(21,22) were cohort studies. All of them included groups of stuttering children aged 2 to 9 years. Twelve out of the 16 records compared data with a group of children not diagnosed with stuttering, matched for age. The total sample in the studies included 604 children diagnosed with stuttering and comparison groups with 1,786 children not diagnosed with stuttering.

Most of the studies selected for this review were observational, published between 1974 and 2020. They mostly indicated an existing relationship between stuttering and inefficient vocabulary. Only one⁽¹⁹⁾ of the studies indicated that stuttering children had better expressive vocabulary results than non-stuttering children. This study had a group of nine stuttering children, whose results were not compared with a control group. Another study⁽²⁰⁾ reported a direct relationship between stuttering symptoms onset around 3 years old and greater expressive and receptive vocabulary efficiency. Three studies reported a relationship between receptive and expressive vocabulary scores below the expected and stuttering children⁽²¹⁻²³⁾, while another four⁽²⁴⁻²⁶⁾ had results in which only the expressive vocabulary was not as expected for age. On the other hand, an American study⁽²⁰⁾ reported that both expressive vocabulary and receptive vocabulary were more developed in children with persistent stuttering, while another four studies⁽²⁷⁻³⁰⁾ reported that there was no relationship between lexical performance and stuttering in the study age range. Only one study concluded that the relationship between stuttering and lexical development in the study children was related only to underdeveloped receptive vocabulary⁽³¹⁾.

Two^(20,21) out of the 16 selected studies – one longitudinal cohort study⁽²¹⁾ and the other with two groups of 16 children each

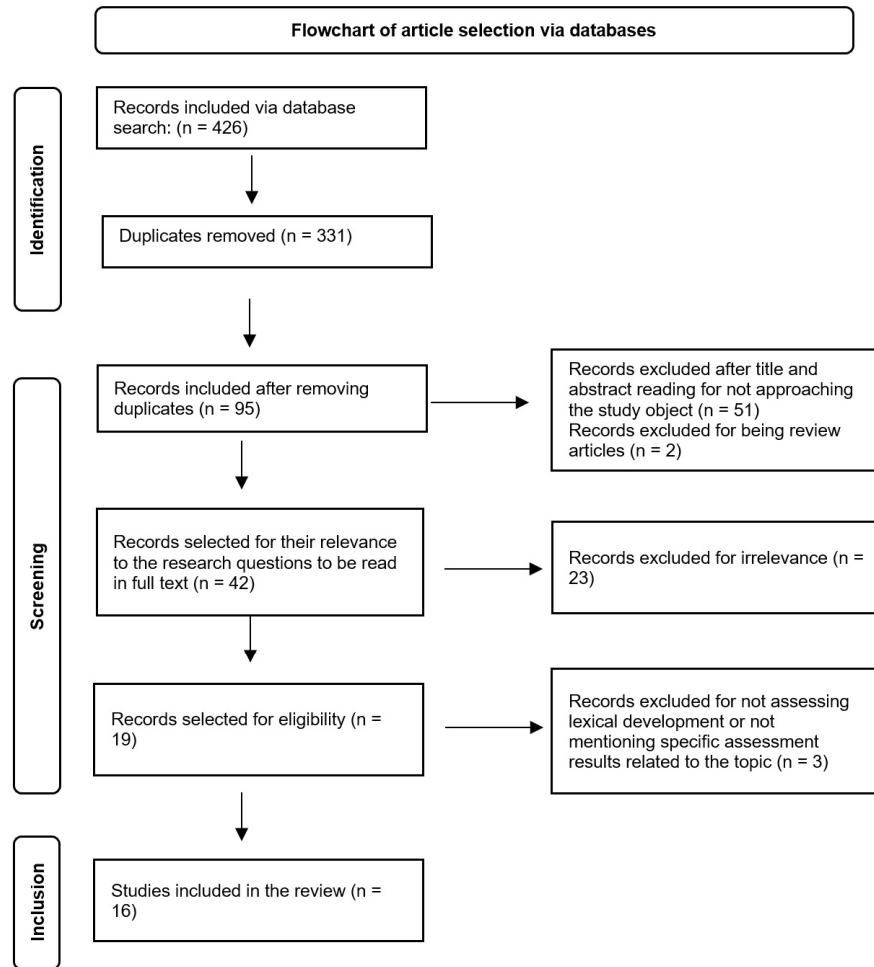


Figure 1. Flowchart of article selection via databases

Table 1. Lexical performance of children with and without a diagnosis of stuttering

| Authors/ year of publication | Study design | Country/ Period | Total <i>n</i> | Diagnosis of stuttering | Lexical analysis instruments | Partial <i>n</i> | Age range at assessment | Characteristics of assessed group | Main findings |
|---|--------------|--------------------|----------------|-----------------------------------|---|--|--|---|-----------------------------------|
| Luckman, Wagovich, Weber, Brown, Chang, Hall & Ratner, 2020 ⁽²⁴⁾ | Case-control | USA | <i>n</i> = 198 | Yes MTSO = 20,16 months | PPVT-R; EOWPVT-R; PPVT-4; PPVT-3; EVT; EVT-2, TOLD-P3; ROWPVT | partial <i>n</i> = 152 SC: 76 CG: 76 22 pairs of girls and 54 pairs of boys | SC: 25 to 100 months CG: 28 to 100 months Mean age: 25 to 79 months | Groups assessed by different authors; no previous ST; NS | EV and RV SC < CG |
| Kreidler, Wray, Usler & Weber, 2017 ⁽³²⁾ | Case-control | USA | <i>n</i> = 56 | Yes | EEG during semantic stimulation | CG: 24 (15 boys, 9 girls) RS: 19 (14 girls, 5 boys) PS: 13 (9 boys, 4 girls) | 5 years | No previous ST; NS | Semantical maturity RS > PS |

Subtittle: SC = Group of stuttering children; CG = Control group; CD = Group of children with disfluency not characterized as stuttering; Sc = Scores; EV = Expressive vocabulary; RV = Receptive vocabulary; RS = Children with recovered stuttering; LRS = Late recovered stuttering; PS = Children with persistent stuttering; NR = No relationship; LD = Lexical development; LA = Lexical access; ST = Speech-language-hearing treatment; AS = Auditory screening; MTSO = Mean time of stuttering symptom onset; PPVT-III = Peabody Picture Vocabulary Test - III; TELD-2 = Test of Early Language Development 2; GFTA (Goldman-Fristoe Test of articulation) = "Sound in words" of GFTA 2; SNTB = Selected Neuromotor Task Battery; NS = Native speakers; EVT = Expressive Vocabulary Test; EOWPVT = Expressive One-Word Picture Vocabulary Test; GAP = GAP Verb List; TTCT = Torrance Test of Creative Thinking; SALT = Systematic Analysis of Language Transcripts; MLU = Mean Length of Utterance; NDW = Number of Different Words; NTW = Number of Total Words; WSVMC-CDI = Words and Sentences Version of the MacArthur-Bates Communicative Development Inventory (CDI); CDI-3 = MacArthur-Bates Communicative Development Inventory-3; CELF-P2 = Clinical Evaluation of Language Fundamentals-Preschool (2nd edition); CELF-4 = Clinical Evaluation of Language Fundamentals-Preschool (4th edition); ROWPVT = Receptive One-Word Picture Vocabulary Test; PROLEC = Readers Process Assessment Test; EEG = Electroencephalography; TACL-3 = Test of Auditory Comprehension of Language-3rd edition; SPILT-3 = Structured Photographic Expressive Language Test-3rd edition; VOCD = Vocabulary Diversity Using; IPSyn = Productive Syntax Use; EPCS = E-Prime Experimental Control Software; PLS-4 = Preschool Language Scale-4th edition; CDI = Communicative Development Inventories

Table 1. Continued...

| Authors/ year of publication | Study design | Country/ Period | Total <i>n</i> | Diagnosis of stuttering | Lexical analysis instruments | Partial <i>n</i> | Age range at assessment | Characteristics of assessed group | Main findings |
|--|---------------------|------------------------------|-----------------|-------------------------------------|--|---|---|---|-----------------------------|
| Wagovich & Hall, 2017 ⁽¹⁹⁾ | Longitudinal | USA Period: 2 years | <i>n</i> = 9 | Yes | PLS-4, PPVT, EOWPVT, VOCD, IPSyn | SC: 9 (6 boys, 3 girls) CG: none | 2 years and 1 month to 4 years and 11 months | No previous ST; NS | EV > SC |
| Leech, Ratner, Brown & Weber, 2017 ⁽²⁰⁾ | Longitudinal | USA Period: 3 years | <i>n</i> = 74 | Yes MTSO: 37,2 months | TACL-3, SPELT-3, VOCD, IPSyn | SC: 50 RS: 22 (18 boys, 4 girls) PS: 28 (15 boys, 23 girls) CG: 24 | | No previous ST; NS | NR with lexical development |
| Watts, Eadie, Block, Mensah & Reilly, 2015 ⁽²¹⁾ | Longitudinal cohort | Australia, from 2002 to 2005 | <i>n</i> = 1619 | Yes | 2 years: WSVMB-CDI; CELF-4; 3 years: CDI-3; 100-word EV; 4 years: CELF-P2; 5 years: CELF-4 | SC: 181 CG: 1,438 | SC: 106 boys, 75 girls Age: 2 to 5 years | No previous ST; NS | EV SC < CG |
| Sakhai et al., 2014 ⁽²⁹⁾ | Case-control | Iran | <i>n</i> = 100 | Yes | Expressive and receptive vocabulary tests | SC: 50 CG: 50 | All males. 10 children of each preschool age group in each research group. | | NR |
| Coulter, Anderson & Conture, 2009 ⁽³⁰⁾ | Case-control | USA | <i>n</i> = 170 | Yes | | SC1: 40 CG1: 40 SC2: 45 CG2: 45 | 3 years to 5 years and 11 months (studies 1 and 2) SC1 and CG1: 25 boys and 15 girls | No previous ST; NS | NR |
| Reilly et al., 2009 ⁽²²⁾ | Longitudinal | Australia | <i>N</i> + 1619 | No | CDI | SC: 137 | 8 months to 6 years | No previous ST; NS | EV and RV SC > CG |
| Anderson, 2008 ⁽³¹⁾ | Case-control | USA | <i>n</i> = 44 | Yes | PPVT-III A, TELD-3, EVT | SC: 22 CG: 22 | 3 years and 1 month to 5 years and 7 months | No previous ST; NS | NR |
| Wagovich & Ratner, 2007 ⁽²⁶⁾ | Case-control | USA | <i>n</i> = 30 | Yes | PPVT-R; EOWPVT; SNTB; GAP | SC: 15 CG: 15 | | No previous ST; NS | EV SC < CG |
| Hartfield & Conture, 2006 ⁽¹¹⁾ | Case-control | USA | <i>n</i> = 26 | Yes | PPVT-III, EVT, SLS of TELD-3, GFTA-2 | SC: 10 boys, 3 girls CG: 10 boys, 3 girls | 3 years to 5 years and 7 months | No previous ST; NS | LA SC < CG |

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Table 1. Continued...

| Authors/ year of publication | Study design | Country/ Period | Total <i>n</i> | Diagnosis of stuttering | Lexical analysis instruments | Partial <i>n</i> | Age range at assessment | Characteristics of assessed group | Main findings |
|---|---------------|--------------------|----------------|--------------------------------|--|--|---|--|----------------------|
| Pellowski & Conture, 2005 ⁽³³⁾ | Case-control | USA | <i>n</i> = 57 | Yes | PPVT-III, EVT, TELD-3, GFTA-2, | SC: 23 CG: 23 | 3 years to 5 years and 11 months. SC: 21 boys, 2 girls. Mean age: 54 months. CG: 18 boys and 5 girls. Mean age: 54 months | No previous ST; NS | EV SC < CG |
| Silverman & Ratner, 2002 ⁽²⁷⁾ | Case-control | USA | <i>n</i> = 30 | Yes MTSO: 2,3 months | PPVT-R; EOWPVT-R; Two CELF-P subtests | SC: 15 CG: 15 | SC: 27 to 47 months CG: 27 to 47 months 12 boys, 3 girls in each group | No previous ST; AS; NS | EV SC < CG |
| Anderson & Conture, 2000 ⁽²⁵⁾ | Case-control | USA | <i>n</i> = 40 | Yes | PPVT-III, TELD-2, GFTA, SNTB | SC: 16 boys, 4 girls CG: 16 boys, 4 girls | 3 years to 5 years and 3 months | No previous ST; AS; NS | EV and RV SC < CG |
| Watkins & Yairi, 1997 ⁽²³⁾ | Observational | USA | <i>n</i> = 32 | Yes | SALT; MLU, NTW, NDW | PS: 9 boys, 3 girls RS: 7 boys, 3 girls RS: 6 boys, 4 girls | | PS: MTSO: 36 months LRS: MTSO: 18 to 36 months RS: MTSO: up to 18 months PS had previous ST | EV and RV SC > CG |
| Westby, 1979 ⁽²⁸⁾ | Case-control | USA | <i>n</i> = 30 | Yes | PPVT-A; TTCT | SC: 10 CG: 10 CD: 10 | Preschoolers and schoolchildren | No previous ST; NS | EV SC < CG |

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(a control and a group of stuttering children) – concluded that stuttering children had more developed receptive and expressive vocabulary than those in the control group. Another study⁽³²⁾, conducted in 2017 in 56 children distributed in the control group (24 children), recovered stuttering group (19 children), and persistent stuttering group (13 children), concluded that the semantics of children with recovered stuttering was more mature than that of the persistent stuttering group.

DISCUSSION

An American longitudinal study⁽²¹⁾ analyzed a group of 181 stuttering children aged 2 to 5 years, comparing them with a control group of 1,438 same-age children. The authors concluded that the group of stuttering children had higher scores than the controls in expressive vocabulary tests. Similar results were reported in another study, conducted in 2017⁽¹⁹⁾, whose

analyzed data demonstrated that sentence length, syntactic complexity, and lexical diversity are related to ruptures typical of stuttering. Hence, they concluded that there is a relationship between stuttering and more developed expressive vocabulary. However, a study⁽²⁹⁾ with two groups of 50 children each (one with stuttering children and the other with fluent ones, matched for age), concluded that stuttering symptoms are not related to lexical diversity in the participants' age range, but rather, to syntactic diversity. This highlights an important gap in the knowledge of lexical skills in stuttering children and the importance of assessing not only this aspect but also other ones related to the linguistic performance of stuttering children.

Most studies analyzed in this review reported a relationship between stuttering children and lexical development short of the expected^(21,24-27,33). However, such a relationship is not consistent, as they mainly pointed out inefficient expressive vocabulary, while some studies reported that the same difficulty may occur in receptive vocabulary or even in

both. This fact may be justified by the methodology used to assess lexical skills, which was greatly heterogeneous among studies, especially concerning the tests used to analyze lexical development. Some studies considered specific expressive and receptive vocabulary assessments, while others used vocabulary assessments that were part of broader language tests, assessments developed specifically for the study in question, or ones used exclusively by the clinical center where the research was conducted.

The age range at the time of the assessment is another possibly relevant factor. It varied considerably between the studies and should be considered an equity factor between study groups, as linguistic performance tends to be more efficient as the child develops. Some studies approached the age of stuttering symptoms onset, whereas others focused on preschoolers. Some studies even included rather wide age ranges, making it difficult to understand the lexical development moment analyzed in their groups.

Only part of the studies included in the review considered the mothers' educational attainment as a predisposing factor to children's good linguistic performance^(17,18,22,27,33). Nonetheless, one of them, a longitudinal cohort study⁽²²⁾ that investigated risk factors for stuttering onset, did not indicate evidence that justified such a relationship. Moreover, reports diverged in another two studies. One of them approached stuttering children's language skills⁽²⁵⁾, assessing children who had already been submitted to speech-language-hearing intervention or were undergoing such treatment at the time of the assessment. The other study⁽²³⁾ revealed that the group of children with persistent stuttering performed more efficiently in both expressive and receptive vocabulary than those with early or late recovered stuttering, after analyzing children that had undergone speech-language-hearing intervention since their symptoms began. The fact that they were undergoing or had undergone speech-language-hearing treatment may have helped them improve their lexical performance.

There is a lack of convincing evidence that stuttering children, as a group, are less efficient than fluent children in some areas of language. Even so, the authors of two articles – one was a critique of the literature⁽¹⁷⁾, and the other analyzed the frequency with which stuttering children used verbs⁽²⁶⁾ – concluded that some stuttering children may have simultaneous language changes. They suggest that individual differences be considered and that the association between language and stuttering be assessed as soon as possible after symptoms begin.

The analysis of the selected studies proved it difficult to synthesize findings due to heterogeneous methodologies and results and the lack of clinical trials – which also hinders the development of inferences. Thus, there is an evident need for longitudinal studies and clinical trials assessing language skills in stuttering children, including expressive and receptive vocabulary, characterizing their lexical performance, and considering not only the time of symptoms onset but also its relationship with the time of the assessment.

CONCLUSION

This scoping review mapped the scientific production related to stuttering and lexical development in children to understand the relationship between stuttering symptoms in their early phase and their co-occurrence in the phase of greater language

development in small children. The analysis of selected studies led to the conclusion that lexical development is associated with stuttering. However, it is not clear whether stuttering children perform worse or better than their non-stuttering peers. There is a gap in the knowledge specifically of lexical performance in stuttering children, which justifies further research addressing this aspect and how it can impact the beginning and maintenance of stuttering symptoms, which must be considered in speech-language-hearing clinical practice.

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