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Pragmatic disorders in children with Phonological Disorder: a systematic review

Alterações pragmáticas em crianças com Transtorno Fonológico: uma revisão sistemática

Alteraciones pragmáticas en niños con Trastorno Fonológico: una revisión sistemática

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Abstract

Introduction: Pragmatics is defined as the social use of language while phonology looks to phonemic and syllabic organization. In the phonological disorder, problems are observed in this organization being possible to affect the pragmatics too. **Objective:** To understand and demonstrate if there are pragmatic alterations in children with Phonological Disorder. **Methodology:** The search for studies was carried out using electronic databases: Embase, Google Scholar, BVS - (LILACS), PubMed, SciELO, Scopus, Web of Science and The Theses and Dissertations Database. The descriptors used were: "child", "speech sound disorder", "language tests", "verbal behavior", "social communication disorder" and "observational studies as topic" and their synonyms. The selected articles met the following criteria: sample composed of children aged 4 to 10 with phonological disorder and within standard development, evaluations of the pragmatics of these children, and observational design. The articles were analyzed by reading them in their entirety and the data were extracted to evaluate the methodological quality and the findings. **Results**: Six articles were found, four national and two international. **Discussion:** Five studies showed

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BGC, EBS: study conception, methodology, data collection and manuscript revision.
LRNA, CB: study conception, methodology and writing of the manuscript.
ANA: critical review of the manuscript.
LPR: study conception, critical revision of the manuscript and orientaion**.**

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that there were pragmatic alterations in children with phonological disorder and one concluded that there was no relationship. **Final considerations**: The present systematic review revealed that the studies show pragmatic alterations in children with phonological disorder, especially regarding the intelligibility of their speech and how this may affect communication initiatives. However, due to the low number of studies, there seems to be a need for future research relating the two subjects for such evidence to be more robust.

Keywords: Child; Specific Language Disorder; Verbal Behavior; Social Communication Disorder.

Resumo

Introdução: A pragmática é definida como o uso social da linguagem e a fonologia diz respeito à organização fonêmica e silábica. No Transtorno Fonológico são observadas alterações nessa organização, sendo possível também afetar a pragmática. **Objetivo**: Compreender e demonstrar se há alterações pragmáticas em crianças com Transtorno Fonológico. **Metodologia**: A busca por estudos foi realizada utilizando as bases de dados eletrônicas: *Embase, Google Scholar, Portal Biblioteca Virtual em Saúde (BVS) - (LILACS), PubMed, SciELO, Scopus, Web of Science*, e Base de Dados de Teses e Dissertações. Foram utilizados os descritores: *"child", "speech sound disorder", "language tests", "verbal behavior", "social communication disorder"* e *"observational studies as topic"* e seus sinônimos. Os artigos selecionados atendiam aos seguintes critérios: amostra composta por crianças de 4 a 10 anos com Transtorno Fonológico e dentro do desenvolvimento padrão, apresentar avaliações da pragmática dessas crianças, e delineamento observacional. A análise dos artigos foi feita pela leitura na íntegra e os dados foram extraídos para a avaliação da qualidade metodológica e dos achados. **Resultados**: Foram encontrados seis artigos, sendo quatro nacionais e dois internacionais. **Discussão:** Cinco estudos demonstraram haver alterações pragmáticas em crianças com Transtorno Fonológico, enquanto um concluiu que não havia relação. **Considerações finais**: A presente revisão sistemática revelou que estudos evidenciam alterações pragmáticas em crianças com Transtorno Fonológico, especialmente acerca da inteligibilidade de fala e de como isso afeta as iniciativas de comunicação. Todavia, devido ao baixo número de estudos, são necessárias futuras pesquisas na temática para dados com evidências mais robustas.

Palavras-chave: Criança; Transtorno Específico de Linguagem; Comportamento Verbal; Transtorno de Comunicação Social.

Resumen

Introducción: La pragmática se define como el uso social del lenguaje y la fonología como la organización fonémica y silábica. En el Trastorno Fonológico, hay cambios en esta organización, y es posible afectar la pragmática. **Objetivo:** Comprender y demostrar si existen cambios pragmáticos en niños con Trastorno Fonológico. **Metodología:** Búsqueda de estudios realizados en bases de datos electrónicas: Embase, Google Scholar, Portal Biblioteca Virtual en Salud (BVS) - (LILACS), PubMed, SciELO, Scopus, Web of Science y Banco de Tesis y Disertaciones. Fueron utilizados los siguientes descriptores: "niño", "trastorno de los sonidos del habla", "pruebas de lenguaje", "conducta verbal", "trastorno de la comunicación social" y "estudios observacionales como tema" y sus sinónimos. Los artículos seleccionados cumplieron con los siguientes criterios: muestra compuesta por niños de 4 a 10 años con Trastorno Fonológico y dentro del desarrollo estándar, valoraciones de la pragmática de estos niños y diseño observacional. Los artículos fueron analizados mediante lectura comprensiva y se extrajeron datos para evaluar la calidad metodológica de los hallazgos. **Resultados:** Se encontraron seis artículos, cuatro nacionales y dos internacionales. **Discusión:** Cinco estudios mostraron cambios pragmáticos en niños con Trastorno Fonológico y uno concluyó que no había relación. **Consideraciones finales:** Esta revisión sistemática reveló que los estudios muestran alteraciones pragmáticas en niños con Trastorno Fonológico, especialmente en cuanto a la inteligibilidad de su habla y cómo esto puede afectar las iniciativas de comunicación. Sin embargo, debido al bajo número de estudios, se necesita más investigación sobre el tema para que la evidencia sea más sólida.

Palabras-clave: Niño; Trastorno Específico del Lenguaje; Conducta Verbal; Trastorno de Comunicación Social.

Introduction

Language is a system made up of rules and symbols[1]. These rules specify how symbols, which can be written or spoken words, should be ordered in sentences. Therefore, language makes the concrete representation of the abstract possible. This ability can be divided into expressive language and receptive language. The first is characterized by understanding and the second refers to the transmission of information, feelings, ideas, and thoughts[2].

In this sense, linguistic domains are determined by phonology, semantics, pragmatics, morphology, and syntax[3]. The nature of these linguistic domains can be divided into three dimensions: the form – how communication is linked (verbal or written); the content – the meaning (concept); and the use – social and contextual implications of communication. Pragmatics is the only domain that refers to the social use of language, bringing functionality to communication[4], and it can also be conceptualized as the conversational use of language[5]. This linguistic domain involves several skills, such as being able to understand and use the context to interpret information received (non-literal expressions, irony), deducing messages that are not explicit (ability to make assumptions)[6], in addition to being able to demonstrate communicative intentions (comment, request, inform) and manage the discourse (start, maintain, end)[4].

Phonology is present as one of the dimensions of the nature of linguistic domains: form. In this sense, the phonological component is responsible for the phonemes and syllables of a language. Children's phonological development can present complications, characterizing such acquisition as atypical. One of these is Phonological Disorder, which is a diagnosis found in children who have a specific difficulty in learning language, and whose speech production is affected. Still, there is no detection of etiological factors that explain it, that is, this child does not have, for example, learning difficulties or intellectual deficits[7].

The classic clinical characteristics in children with Phonological Disorder are spontaneous speech with errors resulting in the production of consonant sounds, age over 4 years, normal auditory thresholds, absence of relevant dysfunctions for speech production, adequate cognitive skills for oral language development through regular socialization processes, ability to understand spoken language appropriate to their mental age, and expressive language without modifications in relation to syntax and lexicon[8].

Considering typical phonological acquisition, as linguistic competence improves, there is also a greater pragmatic capacity[9]. Therefore, it is expected that by the age of 5 years the child will be able to enunciate complete sentences and speak appropriately[10]. However, for this to happen, all language domains must interact correctly. In the case of Phonological Disorder, phonemic and/or syllabic problems are observed; consequently, the child creates organizational patterns that are often different from those that characterize the language being acquired[3]. Such differences can generate great difficulties concerning social bonds since speech intelligibility will be intrinsically related to speech severity. That is, these problems may directly affect the child's communication process[11]. In line with this, it is known that pragmatic changes can be caused by previous problems, such as limited vocabulary and phonological difficulties[12]. Given this, the question arises whether pragmatic skills are also affected in these cases and, if so, in which situations this occurs and the motivation that justifies it. Therefore, the importance of the present study is demonstrated, whose objective is to analyze whether there is evidence in the scientific literature of the existence of pragmatic changes in children with Phonological Disorder.

Methodology

This systematic review was based on the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[13]. The search for scientific studies was constructed and organized based on the research question: "Are there pragmatic changes in children with Phonological Disorder aged between 4 and 10 years?" structured in the PECOT strategy (Chart1). From this, based on the Health Sciences Descriptors (DeCS), Medical Subject Heading Terms (MeSH), and their synonyms, the search strategy was developed (Chart 2).

Chart 1. PECOT question

PECOT question	Terms
Population	Children between 4 and 10 years old
Exposure	Phonological disorder
Comparison	Pragmatic assessment
Outcome	Pragmatic changes
Type of study	Observational

Chart 2. Search strategy

P	*"Child" [MeSH Terms] OR "Children" OR "Childs" OR "Childhood" OR "Child, Preschool" OR "Toddler" OR "Toddlers"*
E	*"Speech sound disorder"[MeSH Terms] OR "Disorder, Speech Sound" OR "Speech Sound Disorders" OR "Phonological Disorder" OR "Disorder, Phonological" OR "Disorders, Phonological" OR "Phonological Disorders"*
C	*"Language Tests" [MeSH Terms] OR "Pragmatic Assessment" OR "Language Test" OR "Vocabulary Tests" OR "Language Comprehension Tests"*
O	*"Verbal Behavior" [MeSH Terms] OR "Behavior, Verbal" OR "Behaviors, Verbal" OR "Verbal Behaviors" OR "Pragmatic" OR "social communication disorder"[MeSH Terms] OR "Pragmatic Communication Disorder" OR "Conversation Skills" OR "Communication Disorders, Social" OR "Social Communication Disorders" OR "Pragmatic Communication Disorders" OR "Pragmatic Communication Disorder"*
T	*"Observational Study" [Publication Type] OR "Observational Studies as Topic" [MeSH Terms] OR "Study, Observational" OR "Studies, Observational"*

The following electronic databases were used for the search: Embase, Google Scholar, Virtual Health Library Portal (VHL) - (LILACS), PubMed, SciELO, Scopus, and Web of Science. In addition to these, the Theses and Dissertations Database was also included in the search for studies. Thus, to search for research papers, each database was searched independently by the first 4 authors, with 2 databases being analyzed by each, in June 2021.

In the study pre-selection phase, inclusion and exclusion criteria were listed (Chart 3). There was no limitation on languages or publication date; studies in English, Portuguese, and Spanish were used.

Chart 3. Inclusion and exclusion criteria

Inclusion criteria	
Population	Children aged 4 to 10 years with phonological disorders and typical development
From studies	Presents assessment of pragmatic skills
Exclusion criteria	
Population	Changes in typical development
From studies	Failing to answer the research question

After defining the search organization and inclusion and exclusion criteria, the studies found in the databases were transferred to the Mendeley bibliographic manager, where duplicate studies were automatically excluded. To carry out the next steps, all titles were transcribed into an online spreadsheet, and, for this, an equitable division was made for each of the two judges to analyze the titles. The next stage took place in the same way, with a third examiner in case of disagreements. In this way, the inclusion and exclusion phases of studies began to compose the final corpus of the review. When reading titles and abstracts, the inclusion criteria were used, while when reading the studies in full, the exclusion criteria were used; both criteria are described in Chart 3.

In the end, the six studies resulting from all stages of analysis were tabulated (in electronic spreadsheet format), considering the main conclusions and information. In this sense, the following data were extracted: name of the study, type of study, authors, country and year of publication, population and ages, instruments for assessing Phonological Disorder and pragmatics, results, and language spoken by the children participating in the study. In each cell, the corresponding information was filled in simultaneously with the number that represents the study.

Next, to assess the risk of bias, two judges analyzed the information from the included studies, using the Downs and Black[14] tool. This tool evaluates the methodological quality of randomized and observational studies, such as reporting, external validity, bias, confounding variable/selection bias, and power. As it has some questions that do not apply to systematic reviews of observational studies, the tool was adapted by deleting some topics (going from 27 questions to 21 or 18, depending on the study). Its checklist has value scores between 0 and 1, where 0 is attributed to the absence and 1 to the presence of criteria that define quality.

Results

In the initial search, 687 studies were identified in the electronic databases. Using the bibliographic reference manager, 70 duplicate studies were excluded, resulting in 617 studies being identified as relevant to the research study.

After reading the titles and abstracts, 605 studies were excluded because they did not mention the terms "Phonological Disorder" and/or "Pragmatics" (in addition to their synonyms), as well as they did not answer the research question in the slightest. In this way, 12 studies were selected for full reading. Of these, 6 were excluded because they met the exclusion criteria (Chart 3). Therefore, the final corpus is composed of 6 studies, of which 4 are national publications and 2 are international publications (Figure 1).

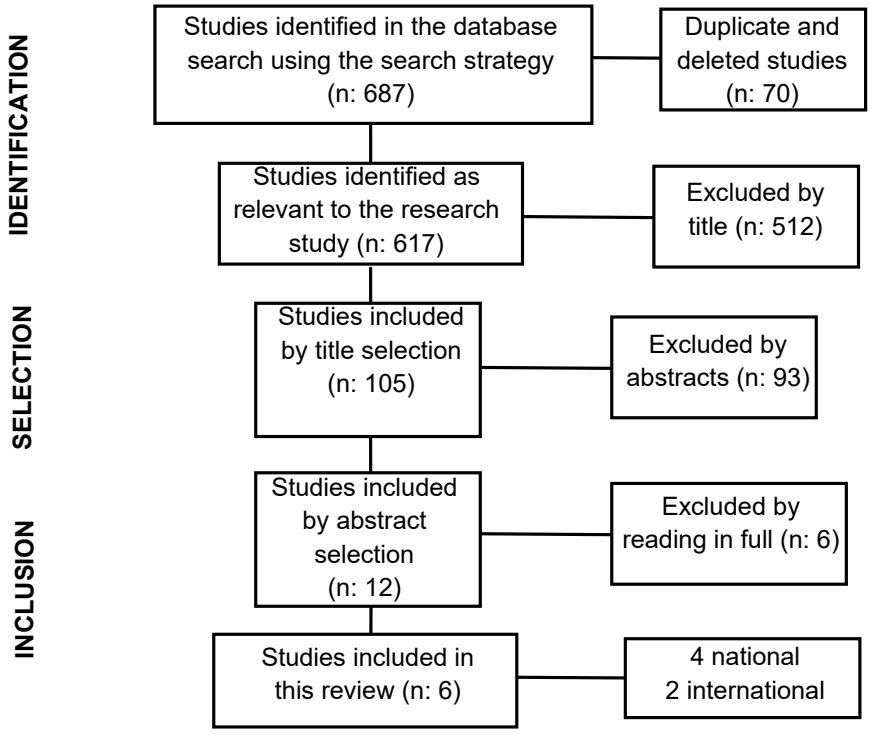

Figure 1. Diagram of the study selection process

Of the studies analyzed, presented in Chart 4, the majority (4) were published in Portuguese, 1 in English, and 1 in Spanish, originating, respectively, from Brazil, the United States and Spain. The publication date of these studies varies between the years 2001 and 2019. Of these studies, only one has a quantitative cross-sectional observational design, while most of the studies have an analytical cross-sectional observational design.

Regarding the population, 3 studies explained the division of the population by sex, and it could be seen that, in these studies, most children were boys. Two other studies brought this separation into groups of children with and without Phonological Disorder, one of them specifying the degree of speech severity as moderate-mild. Regarding ages, the variation was 3 years, being the youngest, and 15 years, being the oldest.

Chart 4. Characteristics of the studies included in the review

Author	Country/ Year of publication	Study design	Population (General characteristics)	Age (in years; months)	Pragmatics assessment instrument	Phonological Disorder assessment instrument
Angélica Savoldi, Leilani Baccin Bruno, Carolina Lisbôa Mezzomo, Brunah De Castro Brasil, Helena Bolli Mota[15]	Brazil, 2014	Observational Cross-Sectional Analytical	12 children (3 F and 9 M), 5 with medium-grade Phonological Disorder, 5 with medium-moderate level and 5 with severe level	3;7-7;8	ABFW Child Language Test – pragmatics	Child Phonological Assessment (AFC); PCC-R based on Percentage of Correct Consonants (PCC)
Fabiana Cristina Carlino, Almir Del Prette, Dagma Venturini Marques Abramides[16]	Brazil, 2013	Observational Cross-Sectional Analytical	10 children (3F e 7M)	6 - 8;11	Habilidades Sociais de Comunicação (HSC)	ABFW instrument; Percentage of Correct Consonants (PCC) and Degree of Speech Intelligibility (GIF)
Lucas Cordeiro Freitas and Zilda Aparecida Pereira del Prette[17]	Brazil, 2013	Observational Cross-Sectional Analytical	120 children	6-15	Social Skills Assessment System (SSRS-BR) – Teacher Version.	Child language test in the areas of phonology, vocabulary, fluency, and pragmatics (Andrade, Béfi-Lopes, Fernandes & Wertzner, 2004),
Kristine M. Yont, Lynne E. Hewitt and Adele W. Miccio[18]	USA, 2001	Observational Cross-Sectional Analytical	24 children (12 with Phonological Disorder, 12 without Phonological Disorder)	4	Breakdown Coding System (BCS)	Percentage of Correct Consonants (PCC)
Laura Giotto Cavalheiro, Ana Rita Brancalioni, Márcia Keske-Soares[19]	Brazil, 2013	Quantitative Cross-Sectional Observational	150 children, 75 without Phonological Disorder, 75 with Moderate-Mild Phonological Disorder	6-6;8	ABFW – children's language test in the areas of phonology, vocabulary, fluency, and pragmatics	Phonological Assessment of Children; Percentage of Correct Consonants-Revised – PCC-R
N. Crespo-Eguílaz, J. Narbona[20]	Spain, 2006	Observational Cross-Sectional Analytical	86 subjects (61 M and 25 F) with Specific Language Disorder	4-9	Children's Communication Checklist (CCC)	

Key: M: Male; F: Female.

To assess the risk of bias and the methodological quality of the studies, based on the criteria of the Downs and Black tool[14] in the 27 standard questions, some of them were marked as NA (not applicable) because they did not encompass the characteristics of the studies in question. Thus, the final analysis was carried out only based on the questions to which the studies fit, with the majority of studies[15 16 17 20] reaching only 18 questions and another 2 reaching 21[18 19]. However, as this is a systematic review with only observational studies, it was expected that some of the checklist questions would not apply. Therefore, the result of the evaluation matches the number of questions that the studies obtained, as shown in Table 1.

Table 1. Results of the methodological evaluation of the studies

Study title	Total scores
'What did you say'?: understanding conversational breakdowns in children with speech and language impairments[18]	16/21
Perfil comunicativo de crianças com desenvolvimento fonológico normal e com Desvio Fonológico[19]	15/21
Subtipos de trastorno específico del desarrollo del lenguaje: perfiles clínicos en una muestra hispanohablante[20]	12/18
Avaliação de aspectos pragmáticos em crianças com Desvios Fonológicos[15]	11/18
Habilidades sociais de crianças com diferentes necessidades educacionais especiais: Avaliação e implicações para intervenção[17]	11/18
Avaliação do grau de inteligibilidade de fala de crianças com Desvio Fonológico: implicações nas habilidades sociais[16]	9/18

Discussion

Analyzing the results found, 5 studies demonstrated that there is a relationship between pragmatic changes in children with Phonological Disorder, while only 1 of them stated that they could not confirm such a relationship.

Regarding the objectives of the studies, 1 national study[15] states that the core is to investigate whether there is a correlation between the gender and age of children with Phonological Disorder in terms of pragmatic performance. After analyzing the data obtained, it was verified that gender is not a determining factor in the severity of speech in Phonological Disorder. However, it was possible to state that there is a correlation between age and speech severity, as the age factor in younger children is seen as favoring more severe cases than in older children.

It was found that, just like children with standard development, those with Phonological Disorder make their communication initiatives verbal. However, the verbal medium is not maintained throughout the conversation, as most of them are more likely to seek to enhance their communicative acts by using gestures associated with the verbal medium[19].

Furthermore, the authors of the study[15] conclude that the pragmatic performance of children with Phonological Disorder is lower than what is expected from those in the same age group with typical language development. And, in opposition to the initial idea, it is found that the greater the severity of the Phonological Disorder, the greater the total average number of communicative acts per minute, the total number of communicative means, and the average total communicative functions. This may be because these children may be compensating for losses in the phonological domain by speaking more to be understood.

In this sense, in other studies[16,18] it was possible to observe that children with Phonological Disorder have greater difficulty in being understood. The study[16] aimed to analyze the relationship between the degree of speech severity and social communication skills in children with Phonological Disorder. The conclusion of the study showed that the lower the degree of speech severity, the greater the damage to their interpersonal relationships, directly affecting their social life. Furthermore, it was observed that in most of the studies analyzed, the largest affected population is male. However, only in the study by Carlino[16] was a relationship demonstrated between gender and speech severity in Phonological Disorder. In this sense, it differs from the study by Savoldi[15], which has a larger male population but does not demonstrate a relationship with the degree of speech severity. The study by Carlino[16] also demonstrated that those participants with an insufficient or regular degree of speech severity were those who had the greatest difficulties in social performance.

Another study[18], in which the objective was to analyze the conversation between children with Phonological Disorder and their mothers, stands out as it discovered patterns that are not only focused on the child but on the interaction with other interlocutors. Therefore, they concluded that, in addition to children having difficulty being understood by their peers, there is a lot of speech disruption – thus relating pragmatic skills to phonology and demonstrating such a relationship.

In a study carried out in Brazil[19], variables were analyzed in the communicative profiles of children

with and without Phonological Disorder. They included the number of communicative acts per minute of the child and the interlocutor, the use of the main communicative means, and the appropriation of communicative space. After the investigation, carried out through filming and protocols, the authors concluded that children with Phonological Disorder demonstrate fewer communicative actions when compared to those with normal phonological development. Furthermore, they have reduced speech intelligibility, which makes it difficult for adults to understand expressive language. There are reports that, at various times, the therapist needed to reframe or try to understand the children's speech so that there was dialogical support, and that behaviors like this can cause interference in the use of conversational rules. Therefore, adults end up appropriating the communicative space with complements and requests for repetition[19].

These complements that the adult performs for the child can be seen in the relationship between parents and children. An international study[21] showed that parents of children with Phonological Disorder believe that their children are not well understood by others in a conversation, which is why they complement and even "speak" for their children.

The fact that children with Phonological Disorder present a reduced number of communicative acts presented in one study[19] can be associated with results obtained in another research study[17], since social skills can be directly related to a greater or lesser number of communicative acts. This last study concluded that the social skills of children with Phonological Disorder are average when compared to groups of students with special needs.

It is important to highlight that children with Phonological Disorder do not have any other changes in their standard development, other than a problem in the organization of phonemes and/or syllables in their language[22]. Therefore, it is possible to have differences when comparing the social skills of children with autism spectrum disorder, who are characterized by having persistent and clinically significant disabilities in communication and social interaction in comparison with children with Phonological Disorder and those who are within standard development[23]. The authors[17] emphasize the need for interventions carried out with these children to emphasize social communication skills[24].

Finally, a study[20] demonstrated, based on the Children's Communication Checklist (CCC), that the children in the sample did not present difficulties in the cognitive and pragmatic use of language. This result is different from other research studies presented previously.

Although the age range between 4 and 10 years old is defined as the inclusion criterion for this study, 2 studies[15 17] presented lower and higher ages (as shown in Chart 4). This fact does not affect the present review, but it is necessary to explain why such studies covered these ages. The first study[15] presented the age of 3 years and 7 months as part of its population and the explanation for including it, even if it was early for diagnosis, was that the child already had characteristics of Phonological Disorder. The other study[17] presents participants aged up to 15 years, which can be explained by the fact that the social skills of children with Phonological Disorders and other educational needs were assessed, without making it clear which ages were included in each group.

In several studies[15 16 17 18 19 20], most of the study population was made up of male children. This may have occurred because previous research[25 26 27 28] already found that this is the gender most prevalent in speech disorders in childhood. The explanation for this predominance is that there is a difference in brain maturation between girls and boys, with the latter being a little slower than the former[29].

The study[16] with the lowest score in the methodological quality assessment failed to achieve some important aspects. Among them, we can highlight that the study did not present the description of exact probability values for the main outcomes, nor did it explain, either in the introduction or methodology, which main outcomes would be evaluated. Furthermore, the participants invited and subsequently included in the study were not representative of the entire population from which they were recruited. Another important point was that estimates of dispersion and variability were not indicated for the main results, in addition to there being no efforts to ensure that outcome evaluators did not have knowledge about exposure – it is necessary to highlight that none of the other studies[15 17 18 19 20] considered this issue.

Furthermore, no studies considered the last question of the checklist, which questions the power of highlighting in relation to the important clinical difference between the groups when the

probability of these differences having occurred by chance is less than 5%. On the other hand, only one study[18] carried out appropriately adjusted analyses in relation to the confounding variables from which the main conclusions were drawn. Of all the questions in the checklist, two refer to the representativeness of the population concerning the recruitment site and were covered by a single study[19]. They are, respectively, about the invited participants and the individuals included in the study.

The study[18] that achieved the highest score among all obtained 16 out of 21 items. Analyzing them, the study obtained a higher score compared to others regarding the clear description of the distribution of the main confounding factors in the comparison groups – scoring 2, while all other studies scored 0 or NA (not applicable). Furthermore, it scored 1 for adequately carrying out the analysis in relation to confounding variables, from which the main conclusions were drawn, while the others[15 16 17 19 20] scored 0 or NA.

All studies clearly described: the hypothesis/objective/study; the characteristics of the included patients, interventions/exposures; and the main results (when based on post hoc exploratory analysis, they also need to be described in detail). Furthermore, the characteristics of patients lost to follow-up were described, the statistical tests used in the primary analyses were adequate, and the primary outcome measure was accurate (valid and reliable).

Taking all this into consideration, when analyzing the bias analysis tool, it is highlighted that not all topics could be applied to the research studies, meaning there was a need to adapt the tool for better use, by removing some topics (going from 27 questions to 21 or 18, depending on the study). Another point to highlight is that, at times during the production of the systematic review, there were difficulties in the data extraction and analysis processes, due to the population of some studies not being well defined or some information not being very clear.

Final considerations

The present systematic review showed that studies with data from children with Phonological Disorders present pragmatic changes, especially related to speech severity, and how they can affect communicative initiatives. Most of the studies show that the initial hypothesis, that pragmatics is influenced by Phonological Disorder, may be true. However, it is possible to highlight the scarcity of studies relating the two linguistic aspects, and more research must be carried out on the subject. Of all the studies analyzed, one of them showed the non-existence of a relationship between Phonological Disorder and pragmatic changes, thus demonstrating that there may still be signs of low evidence because of this association. This need is justified by the fact that the results are transferred to clinical care, as speech therapists need strong indicators to establish therapeutic guidelines in the treatment of children with Phonological Disorder. They may have inferior communicative skills and require therapy that also focuses on this aspect and not just on the phonology component.

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