Literature Review

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Oral language assessment of children with visual impairments: an integrative literature review

Avaliação da linguagem oral de crianças com deficiência visual: uma revisão integrativa da literatura

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ABSTRACT

Purpose: to review the national and international literature regarding instruments, methods and techniques for language assessment in visually impaired children. **Research strategy:** searches in the VHL, PUBMED and SCOPUS databases using the descriptors vision disorders, child language, low vision, blindness, speech-language pathology and rehabilitation. **Selection criteria:** articles published in national and international journals, in English, Spanish and Portuguese. Studies that were unavailable for reading, with a sample other than children, not addressing the subject, or that reported sensory impairments associated with visual impairments were excluded. Studies that dealt with intervention were also excluded, except for those that also addressed assessment. The references of the articles read in full were selected according to these criteria. The investigators evaluated the proposed assessment instruments/methods/techniques, as well as the objectives of the studies, their samples and main results. **Results:** 157 articles were retrieved, of which 6 were selected for full reading based on the exclusion criteria, and another 6 studies were obtained from their references, thus totaling 12 articles. Seven studies involved preschool and blind children, with various assessment instruments/methods/techniques, ranging from assessments of specific linguistic levels to socio-communicative skills. The objectives of the studies were related to the comparison between the development of children with and without visual impairment. **Conclusion:** the review provided contributions to analyses of the language assessment of visually impaired children, such as the use of the remaining senses; no study had an instrument to assess language levels in schoolchildren with VI.

Keywords: Vision disorders; Speech, language and hearing sciences; Child language; Language; Language tests

RESUMO

Objetivo: revisar a literatura nacional e internacional a respeito dos instrumentos, métodos e técnicas para avaliação de linguagem de crianças com deficiência visual. **Estratégia de pesquisa:** foram realizadas buscas nas bases BVS, PubMed e Scopus, utilizando-se os descritores transtornos da visão, linguagem infantil, baixa visão, cegueira, fonoaudiologia e reabilitação. **Critérios de seleção:** artigos publicados em periódicos nacionais e internacionais, nos idiomas inglês, espanhol e português. Trabalhos indisponíveis para leitura, com amostra composta por não crianças, não pertencentes ao assunto abordado, ou que mencionassem deficiências sensoriais associadas à visual, foram excluídos. Foram também excluídos os artigos que versassem sobre intervenção, salvo os que também abordassem a avaliação. As referências dos artigos lidos na íntegra foram selecionadas de acordo com esses critérios. Analisaram-se os instrumentos/métodos/técnicas de avaliação propostos, os objetivos dos estudos, sua amostra e principais resultados obtidos. **Resultados:** foram recuperados 157 artigos, dos quais, selecionaram-se, a partir dos critérios de exclusão, 6 para leitura integral, e mais 6 obtidos de suas referências, totalizando 12 artigos. Sete trabalhos foram realizados com crianças pré-escolares e cegas e os instrumentos/métodos/técnicas de avaliação foram variados, contemplando desde avaliações de níveis linguísticos específicos, até habilidades sociocomunicativas. Os objetivos dos estudos relacionaram-se à comparação entre o desenvolvimento da criança com deficiência visual e vidente. **Conclusão:** a revisão trouxe contribuições para pensar a avaliação da linguagem de crianças com deficiência visual, como a utilização dos sentidos remanescentes; nenhum estudo apresentou instrumento para avaliação de níveis da linguagem em crianças escolares com deficiência visual.

Palavras-chave: Transtornos da visão; Fonoaudiologia; Linguagem infantil; Linguagem; Testes de linguagem

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INTRODUCTION

The World Health Organization (WHO) estimates that there are approximately 2.2 billion people with some degree of visual impairment (VI) worldwide[1]. The WHO also reports that approximately one billion of these cases originate from preventable or curable causes, such as congenital glaucoma, unoperated congenital cataracts, uncorrected refractive errors, such as myopia, hyperopia and astigmatism, among others[1,2].

Visual impairment can be defined as the presence of alterations in one or more visual functions, due to a certain eye disease, in a way that varies, in a spectrum, from low vision to blindness[2]. The visual functions are associated with the quality with which the image reaches the individual's eyeball, being very important for determining the strategies and therapeutic approaches to be taken by the professionals of the habilitation and/or rehabilitation team responsible for the care of the subject with visual impairment[3].

There are many visual functions, such as visual acuity is one, which is a quantitative measure of the individual's vision, related to the ability to see objects clearly; or the visual field, which refers to the measure, in degrees, of the area seen by the subject, when facing a given object in space; or color vision, which is related to the ability to identify different wavelengths of light; contrast sensitivity, referring to the identification of differences between brightness patterns between two nearby surfaces, among others[3,4].

According to the literature focused on visual impairment, children with this impairment may have developmental delays, which, if not addressed early, will have a negative impact on the language acquisition process. Some authors[5-7] report that children aged 0 to 3 years with VI generally have fewer opportunities to interact with their parents, which occurs due to the feeling of mourning they experience for the loss of the ideal child and the lack of knowledge they have about the VI. This situation can also be caused by the lack of communicative actions on the part of the child, such as looking at objects and the caregiver(s) and performing communicative gestures, since, given this situation, there is a decrease in responses of the adult interlocutor for not receiving feedback from the child regarding their communicative attempts[8,9].

In addition, a deficit in the performance of voluntary movements, which is usually present in children with VI, also contributes to the restriction in interactions, since it is known that vision is one of the senses that contribute to the maintenance of body posture and balance[10], in addition to being related to the exploration of the environment by children, since, when seeing objects, children perform movements to explore them, that is, there is an integration between visual and neuropsychomotor development[8,11]. Thus, the lack of vision, or visual deficit, negatively influences these mentioned aspects, and the active exploratory activity of the child is limited, which increases their passivity and, consequently, leads to language disorders. This is due to the fact that visual impairment will have an impact on the definition of the relations between signified and signifier, which are essential to the language acquisition process[7].

For this reason, the meanings of words may not be well established, especially for blind children, due to their more pronounced visual deficit. This situation can lead to the emergence of issues such as echolalia - repetitive and meaningless speech - and verbalism - use of terms whose meaning is known only through someone else's explanation and not through one's own experience, which are not always supported by reality[7]. Due to these characteristics, preschool children with VI can be misdiagnosed with autism spectrum disorder (ASD), which shows the importance of a differential diagnosis between the characteristics resulting from VI and those related to autism, in order to offer the best possible intervention to the child and guardians[12]. Some authors[12] even report that defining this differential diagnosis is one of the main difficulties faced by professionals in the field of VI.

Based on these facts, it is possible to note that children with visual impairment are at risk of delay and/or complications in language development. Therefore, early guidance and intervention with these subjects and their guardians are essential, so that alternative strategies consistent with the child's visual characteristics can be used, which allow them to interact with others (adults) and with the environment around them, as well as define the relationships between meaning and signifier[7,9]. Therefore, it is inferred that the disability alone is not responsible for language issues in children with VI, but the interactive patterns established between them and their parents or caregivers[9].

As a professional who works, among other aspects, with disorders related to language development, in a comprehensive manner, speech-language pathologists are the best suited to provide guidance to parents/caregivers on the best strategies to stimulate and interact with a child with VI. If necessary, speech-language pathologists can carry out therapeutic interventions with children, thus being a complementary and essential professional to the habilitation team[5,13,14].

To be able to work in the context of habilitation and rehabilitation of subjects with VI, speech-language pathologists must be aware, not only of the concepts and specificities of this area, but also of the particular characteristics, limitations and potential of the child in relation to oral language, as well as the child's family and sociocultural environment. It should be noted that the best possible intervention depends on this comprehensive speech-language evaluation.

In view of these assumptions regarding language development in children with VI and the importance of the assessment, it is essential to understand how the speech-language assessment in oral language of these children has been described by national and international scientific studies, so that health professionals and researchers have theoretical and methodological subsidies that guide their clinical practices and/or scientific research in the area of VI and speech-language pathology. Beforehand, it is believed that there are few studies in the literature on this topic, since visual impairment is traditionally not considered as one of the main areas of work of speech-language pathologists.

PURPOSE

In this context, this study aimed to review the national and international literature regarding instruments, methods and techniques proposed for the assessment of the oral language of children with VI.

RESEARCH STRATEGY

This is an integrative literature review study. In this type of review, data from studies with different approaches and designs (qualitative and quantitative, experimental and non-experimental, etc.) are described and critically analyzed, aiming to provide a more complete understanding of a certain phenomenon that is being investigated[15].

The six steps proposed by the literature[15] were followed for the development of the review, namely: definition of the guiding question, bibliographic searches in databases, data collection of studies, critical analysis of the works included in the review, discussion of the review results and final presentation of the work/knowledge synthesis.

The following guiding question was defined for the first step: "Which instruments/methods/techniques for assessing the oral language of children with visual impairment have been proposed by literature studies, and how do these studies propose their application?"

Then, in the second step, bibliographic searches were carried out in the electronic databases VHL, PubMed and Scopus, using both the Health Sciences Descriptors (DeCS) and the Medical Subject Headings terms (MeSh terms). These three electronic databases were selected because they are widely used in the large area of health with which this review research is related. The DeCS terms used were: vision disorders, low vision, blindness, speech-language pathology, child language and rehabilitation, in English, Spanish and Portuguese. In turn, the MeSh terms were: vision disorders; vision, low; blindness; speech therapy and rehabilitation. In the PubMed database, the search fields title/abstract and MeSh terms were used; while no specific search fields were selected in the VHL and Scopus.

The search strategy consisted of two queries performed in each of the databases, using the same combinations, so that only the vocabulary (MeSh or DeCS) was different between the bases. The following combinations were used:

1st search: ((*vision disorders OR trastornos de la visión OR* transtornos da visão)) *OR* ((*vision*, *low OR baja visión OR* baixa visão)) *OR* ((*blindness OR ceguera OR* cegueira)) *AND* ((*speech, language and hearing sciences OR fonoaudiología OR* fonoaudiologia)) *AND* ((*rehabilitation OR rehabilitación OR* reabilitação))

2nd search: ((*vision disorders OR trastornos de la visión OR* transtornos da visão)) *OR* ((*vision*, *low OR baja visión OR* baixa visão)) *OR* ((*blindness OR ceguera OR* cegueira)) *AND* ((*child language OR lenguaje infantil OR* linguagem infantil))

It should be noted that the descriptors "blindness" and "low vision" were used in association with vision disorders, through the Boolean operator "OR" in order to also recover studies whose sample was composed only of children with low vision or blind. No period was delimited for the survey of articles, which aimed to obtain the greatest possible number of studies that were useful for the purpose of this research and answered the guiding question, in view of the previous hypothesis of the authors, established before the definition of the search strategy, that there would be only few studies in the literature regarding the topic addressed.

The resource of restricting the results to available full texts or free full texts was also not used, since there is a possibility that the author had access to some texts via the institutional library, even if these texts were not informed in the electronic databases as available for reading.

SELECTION CRITERIA

Still in the second step of the review, the following inclusion and exclusion criteria were defined as proposed by the literature[15]:

- Inclusion criteria: Articles published in scientific national and international journals in English, Spanish and Portuguese.
- Exclusion criteria: articles that were not related to the subject addressed and/or did not answer the guiding question of this review, or that mentioned other sensory deficiencies associated with VI, such as deafblindness, or whose sample consisted only of individuals older than 12 years old (not children), or whose full text was not available. Studies that addressed speech-language intervention were also excluded, except for those that also addressed assessment.

After eliminating the duplicated articles obtained with the search strategies, the studies were submitted to the exclusion criteria, from the reading of the titles and abstracts, which resulted in a set of articles that would be used for this review. After this procedure, the references contained in the defined studies were selected, in order to further expand the possibilities for discussion regarding the proposed topic, which is a procedure provided for in the integrative review method[15]. The same inclusion and exclusion criteria already described were applied in the selection of these references, and the titles and abstracts of the studies were read for this purpose.

Figure 1 shows a summary of the selection steps followed in this survey, as well as the number of articles resulting from each one of them.

DATA ANALYSIS

In the third step proposed by the literature[15], aiming at collecting and analyzing data from the studies selected in the review, the researchers evaluated the objectives of the studies, the methods, techniques and language assessment instruments presented by each one of them, the characteristics of their samples regarding sample size, type of VI (blindness and/or low vision), gender and age group, in addition to the main outcomes obtained in each one with the application of the proposed instruments/methods/techniques. These data were extracted and recorded and will be displayed and critically discussed below, making up the next three steps of the integrative review (critical analysis of the studies included in the review, discussion of their results and final presentation of the work/knowledge synthesis)[15].

RESULTS

157 articles (Figure 1) were found when applying the described search strategies. After removing duplicate studies and applying the inclusion and exclusion criteria, 6 articles were selected for full content reading. Considering the inclusion

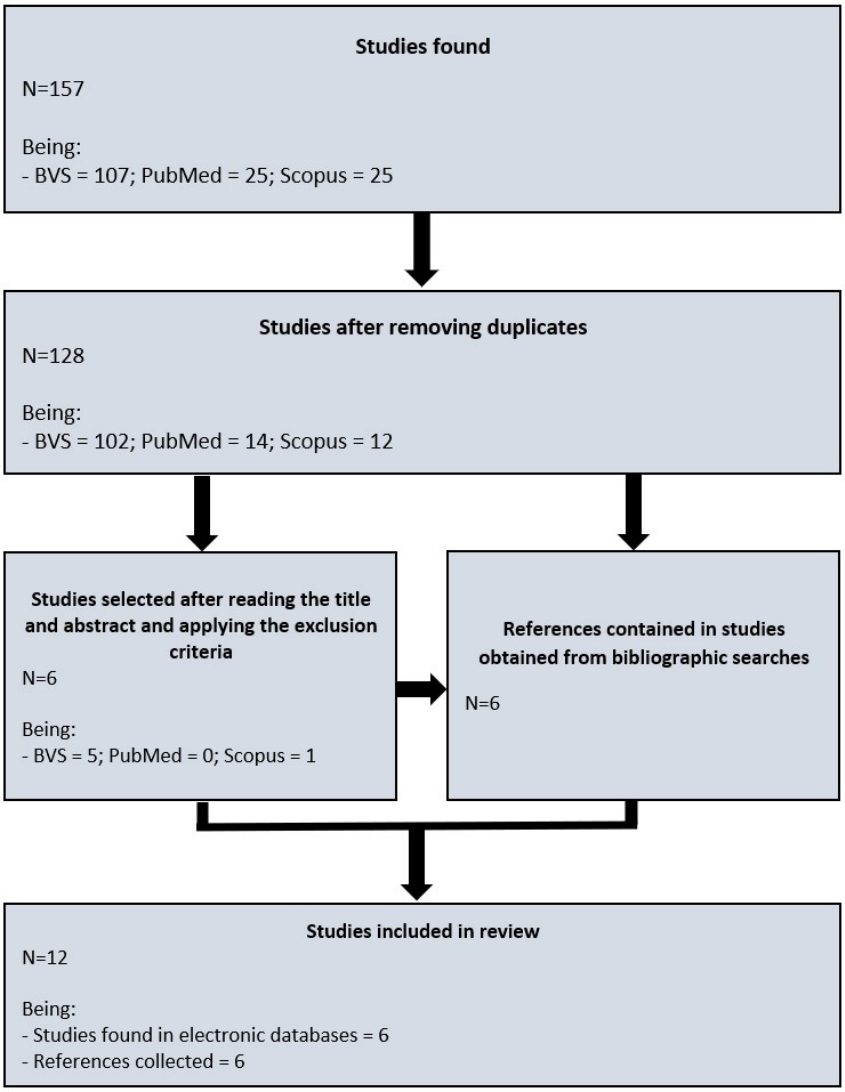

Figure 1. Flowchart with the selection steps of the review sample and the respective number of studies
Subtitle: N = Number of studies

of references, the final sample of this research consisted of 12 articles. It is noteworthy that the VHL was the database with the largest number of articles found, while no study that met the selection criteria of this review was found in PubMed (Figure 1). As for the characterization of the sample, Chart 1 shows the characterization of the selected articles according to title, author(s), year of publication and journal in which they were published (volume, number and pages).

As for the country in which the studies were carried out, there was a greater amount of international research, with 5 national[16-20] and 7 international[21-27] articles among the selected sample (Chart 1).

The studies obtained were published in several journals, so that 4 of them were obtained from journals whose scope was related to language in particular[17,21,22,25], 5 to health and child development in general[16,20,23,24,26] and 3 to cognition and mental health[18,19,27].

Regarding the year of publication of the studies, 7 of the selected studies were published between 2005 and 2018, which proves that there is a predominantly recent interest in this topic, despite the considerable amount of articles prior to 2005, mainly in the international literature.

With regard to authorship, four authors stood out in the findings of this study: Tadić V, Pring L, Dale N and McConachie HR, who combined published about 33% of the studies found.

Chart 2 shows the purpose, sample/participants and their characteristics, the instruments/techniques/evaluation methods used in each research and their main outcomes.

DISCUSSION

The integrative review method provided the evaluation of studies with different approaches to the proposed topic, which contributed to its broad knowledge. Firstly, it is noteworthy that, even in the face of a recent greater interest in the topic (Chart 1), a small number of references were found, which reflects its incipience in the literature in the field of VI and

Chart 1. General characterization of the articles selected for review

Reference*	Title	Author(s)	Journal / Year of Publication
22	"*The role of repeated and echoed utterances in communication with a blind child*"	Kitzinger M.	British Journal of Disorders of Communication, 1984
26	"*Early language development and severe visual impairment*"	McConachie HR.	Child: Care, Health and Development, 1990
25	"*Pragmatic functions of blind and sighted children's language: a twin case study*"	Perez-Pereira M, Castro J.	First Language, 1992
23	"*Early expressive language of severely visually impaired children*"	McConachie HR, Moore V.	Developmental Medicine & Child Neurology, 1994
24	"*Characteristics of maternal directiveness and responsiveness with young children with visual impairments*"	Hughes M, Dote-Kwan J, Dolendo J.	Child: Care, Health and Development, 1999
20	"Análise da comunicação verbal e não verbal de crianças com deficiência visual durante interação com a mãe"	Oliveira JP, Marques SL.	Revista Brasileira de Educação Especial, 2005
18	"Mediação semiótica: estudo de caso de uma criança cega, com alterações no desenvolvimento"	Silva MA, Batista CG.	Psicologia: Reflexão e Crítica, 2007
27	"*Are language and social communication intact in children with congenital visual impairment at school age?*"	Tadić V, Pring L, Dale N.	Journal of Child Psychology and Psychiatry, 2010
19	"O desenvolvimento de crianças cegas e de crianças videntes"	França-Freitas MLP, Gil MSCA.	Revista Brasileira de Educação Especial, 2012
21	"*Story discourse and use of mental state language between mothers and school-aged children with and without visual impairment*"	Tadić V, Pring L, Dale N.	International Journal of Language & Communication Disorders, 2013
17	"Perfil fonológico de crianças com baixa visão de 6 a 9 anos de idade em uma instituição para cegos na cidade de Salvador – BA"	Lima AL, Nunes RTA.	Revista CEFAC, 2015
16	"Intervenção fonoaudiológica na deficiência visual associada à paralisia cerebral: relato de um caso"	Francoy Alpes M, Gomes Valério N, Manfredi dos Santos C, Pupin Mandrá P.	Archives of Health Sciences (Online), 2018

*Articles organized according to chronological order of publication, keeping the respective reference numbers

points to the need to carry out of more studies focused on it, in order to develop more theoretical resources to guide the clinical practice of speech-language pathologists who work, or wish to work, in a team for the rehabilitation of children with VI.

With regard to the objectives of the studies, despite the many different objectives found, four[17,19,20,25] of them are aimed at comparing the language development of children with VI and sighted (Chart 2). By adopting such purposes, these studies rely on the parameter provided by "typical development" to verify the effects of disability and whether they exist. However, despite being useful, these comparisons are not always relevant to clinical practice, since the divergences found in relation to "typical development" may represent specific language acquisition processes of this subject, and not necessarily a language development "delay" or "impairment".

For example, one of these studies[20] reports in its results that there were few gestural productions by children with VI, both in the context of free and planned interaction, when compared to sighted children (Chart 2), which can be attributed to the lack of vision or visual deficit and, therefore, constitute a characteristic of children with VI. Although these differences seem obvious in some cases, such as the one described in the aforementioned study[20], they still require an accurate analysis of the professional to establish the limit between normality and pathology.

As for the sample of the reviewed studies, a significant number of the articles[18-20,22-25] provide results of research carried out with a reduced "n" (less than ten participants), composed of preschool children (under 6 years old), of which at least one presents an ophthalmological diagnosis of blindness (Chart 2). As for the restricted sample size, it can be explained by the objectives of these studies, which do not require a need to generalize a given result or perform population estimates.

The option for the preschool age group, also observed in most of the reviewed articles, is in line with the consensus argument in the specialized literature on child development. This argument is based on the fact that this is the period of life in which acquisitions and the most important milestones for the individual's development occur, including those related to oral language, such as babbling, the first words, the notions of conversation shifts, etc[28]. The total visual deficit in this age group can result in a significant delay in the child's global development, if there is not adequate early stimulation[6,7]. This fact explains the interest in the study of blindness demonstrated by most of the studies reviewed here, as they propose to investigate the way in which the aforementioned stimulation occurs for the development of different aspects of language in these individuals.

Early stimulation/intervention with blind children is extremely necessary in order to avoid future complications

Chart 2. Description of the studies according to purpose, sample, evaluation tools/techniques/methods and main outcomes

Reference*	Purpose(s)	Sample	Lang.Ass. ITM	Main Outcomes
22	To investigate the proportion of repeated sentences in the speech of a blind child and to identify their functions in the interaction with an adult.	A 3-year-old female blind child	Audio recordings with subsequent transcription and classification of repetitions, according to their function	Repetitions in the child's speech helped to keep the conversation going and to obtain clarification (mutual understanding).
26	To investigate language development patterns in children with severe VI at 2 years of age.	Data from the medical records of 60 children with severe VI of both genders, aged between 1 year and 1 month and 2 years	*Reynell-Zinkin Developmental Scales for Young Visually Handicapped Children* (verbal comprehension and expressive language)	Children with VI had expressive development prior to understanding.
25	To analyze the development of pragmatics in a blind child compared to a sighted child of the same age.	Two twin female children, 1 blind and 1 sighted, monitored from 2 years and 5 months to 3 years and 5 months.	Monthly video recordings in everyday situations, with transcription and analysis of pragmatic categories and calculation of the number of morphemes per utterance (MLU)	The blind child showed different pragmatic functions when compared to her sighted twin.
23	To investigate the early expressive language of children with severe VI, to facilitate the interpretation of findings from previous studies.	18 children of both genders (9 with blindness and 9 with severe VI), aged 13 to 21 months	*Reynell-Zinkin scales for young visually handicapped children*; *Social Maturity Scale for Blind Preschool Children*	Children with VI had an initial delay in expressive language when compared to what is expected for sighted children, but this was eventually compensated for.
24	To verify the quality, quantity and adequacy of the mother's use of directive sentences and their relationship with the child's sociocommunicative skills.	17 blind children of both genders, aged between 20 and 36 months, and their mothers	*Reynell-Zinkin Developmental Scale for Young Visually Handicapped Children* and *Social Maturity Scale for Blind Preschool Children*	Excess directness (requests/ questions made by the caregiver) negatively correlated with pragmatic performance.
20	To describe pragmatic performance of children with VI and sighted during interaction with their mothers.	6 children of both genders with a mean age of 5 years and 10 months, (2 blind, 2 with low vision and 2 sighted)	Anamnesis script for mothers, video transcription script and protocol for characterizing performance in pragmatics	Children with VI had normal linguistic development, with little gestural production compared to sighted children; mothers of children with VI described objects and the environment.
18	To analyze aspects of the development and acquisitions of a blind child during interdisciplinary consultations.	A blind female child, with developmental disorders, followed from 4 years to 6 years and 4 months	Analysis of video transcripts and field diary notes, and data categorization	Child progressed in child-adult-object interactions, starting to use speech
27	To examine language and social interaction of school-aged children with congenital VI.	15 children with congenital blindness and 26 sighted, from 6 to 12 years old, of both genders	Verbal scale of the adapted *WISC-III, Clinical Evaluation of Language Fundamentals*-3 (CELF-3), *Children's Communication Checklist* - 2 (CCC-2) and *Social Communication Questionnaire* (SCQ)	Children with VI performed better than sighted children in formal CELF-3 language tests, but worse in sociocommunicative skills (CCC-2 and SCQ results).
19	To present development results in general and specific areas (including language) of 2 blind children (one stimulated systematically and the other unsystematically) and compare their results, among themselves and with 2 sighted children.	Two blind children and 2 male sighted children with a mean age of 5 years	Adapted Operationalized Portage Inventory (OPI) (expressive and receptive language)	The child who received unsystematic stimulation had worse results in the language assessment, both in relation to the systematically stimulated child and in comparison with the sighted child.
21	To investigate strategies used by mothers of children with VI to refer to aspects of the "mental state", in comparison with those adopted by mothers of sighted children, and whether they are associated with the child's sociocommunicative skills.	12 children with congenital (severe or profound) VI and 14 sighted children, all aged 6 to 12 years, and their mothers	Verbal Scale of the *WISC-III; Children's Communication Checklist* - 2 (CCC-2) and Social Communication Questionnaire (SCQ)	Positive and significant correlation between expressions about mental state and maternal descriptions and children's pragmatic abilities measured by CCC-2.
17	To describe the "phonological profile" of children with low vision aged 6 to 9 years without other impairments and compare the profile with the expected results for the age group.	20 children with low vision of both genders, aged between 6 and 9 years	Adapted Children's Phonological Assessment Protocol (PAFI)	60% of the participants had a phonological profile below the expected for the respective age group.
16	To characterize communicative behavior and discuss aspects of speech-language pathology assessment and intervention in children with low vision and cerebral palsy.	A female child aged 2 years and 6 months, with low vision in the LE and blindness in the RE, and delay in the Neuropsychomotor Development	Behavior Observation Protocol (PROC) and Language Development Assessment (LDA), both adapted	Normal performance for receptive language and below expectations for emissive language; deficit in dialogic and cognitive skills.

*Articles organized according to chronological order of publication, keeping the respective reference numbers

Subtitle: VI = Visual impairment; LE = Left eye; RE = Right eye; Lang.Ass. ITM = Language assessment instruments/techniques/methods

in development, either through therapy with them, or through guidance from the interdisciplinary team to the family, so that they can stimulate the child's skills[13,28]. In this sense, one of the studies found in this review[19] reported that the blind child who did not receive systematic and specialized early stimulation had worse results in the application of the proposed language assessment instrument, both in relation to the other blind child who was constantly stimulated and systematically, as for a sighted individual of the same age group and school grade as her (Chart 2).

Another possible explanation for this preference for studying blindness in the articles selected is the particular way in which blind children acquire and develop language. Some authors[6,7] have reported that this is a result of the lack of vision that obliges the individual to use the remaining senses and, in this way, the concepts, signs and the complex relationships existing between them are presented to the child in a different way, different from that which occurs with children who can see or have low vision. In addition, this concept acquisition process is also affected by the mediation of other people (the sighted adult) so that, through stimuli to the remaining senses and the use of language itself, the blind child is introduced into the culture of the social environment in the which one is immersed[6].

Three studies found in this review highlighted the importance of the sighted adult[20,21,24], and found satisfactory results in the language assessment when the mother's interaction with the child was effective, in the sense of making comments and descriptions about the "mental state" of other people, that is, their feelings and thoughts. This helps in understanding the notion of "self and other" and in the development of pragmatic skills[21]. In addition to helping to avoid excessively controlling the child's actions from the use of many directive sentences, since this was negatively correlated with the development of sociocommunicative skills[24] and valuing dialogue and the description of objects and actions from oral language[20] (Chart 2).

With regard to the language assessment instruments/techniques/methods used in the studies, the findings showed a great variety, ranging from protocols for the assessment of a single specific level of language[17], to the observation of the child's linguistic manifestations in a context free of interaction with the other (adult) in the light of a certain theoretical framework and/or through the use of questionnaires applied with the parents/guardian[18,22,25,27]. This variety demonstrates that there is no consensus on ways to assess oral language aspects of children with VI. Nor can it be denied that the option for one or another instrument/method/technique was based on the objectives of each of the studies and on the language level(s) focused on by them, as well as the different language conceptions assumed.

However, despite this variability, six of the studies that cite a standardized assessment protocol[19-21,23,24,27] used indirect assessment instruments[29], that is, questionnaires, interview scripts, inventories, checklists, development scales, etc. (Chart 2). The benefit of these instruments is that they can be applied without requiring the child to do any specific task, as they are based on observations of the mother/caregiver-child interaction, on the child's behavior in the interaction with the therapist, or on questions addressed to the parents regarding the child's behavior in the home context.

Regarding the latter way of obtaining data on the child's language development, that is, through responses by parents/guardians to standardized questionnaires, two studies[21,27] used this technique through the Children's Communication Checklist-2 (CCC-2) and the Social Communication Questionnaire (SCQ), which assess communicative aspects and social interaction in children and adolescents, and are generally used in the screening of patients with ASD.

However, despite being useful for assessing the language of children with VI, since they do not depend on performing visual tasks and have a great chance of reflecting reality, the responses of parents/guardians to the aforementioned questionnaires may be underestimated or overestimated, as they do not have specific knowledge about the peculiarities of language development in children with VI, as reported in the discussion of the results of one of the studies[27], which requires caution in generalizing the findings of these two studies[21,27]. Therefore, in addition to applying questionnaires to parents/guardians, so that there is greater reliability in the evaluation results, it is suggested that therapists observe a situation of interaction between the guardian and the child, even in the office environment, in order to observe aspects that may not be covered by them.

In turn, the characteristics and capabilities of each individual must be taken into account when applying direct instruments, which require the performance of certain tasks, under the risk of the professional not being successful in collecting data due to the inability of the subject to perform the task requested by the test, which does not apply when thinking about indirect instruments. Thus, when it comes to VI, the options for direct language assessment instruments that can be applied to this population are more restricted, due to the visual skills required by most of them[29].

In this sense, only three studies found in this review[16,17,27] used direct language assessment instruments, which were adapted and are not validated for use with children with VI. However, in this adaptation, the authors of one of the studies[17] did not consider issues crucial to the care of people with VI, especially low vision (the focus of the aforementioned study), namely: the visual acuity of each evaluated child, the characteristics of other visual functions, as well as controlling the lighting in the environment, which is not mentioned in the text, and they found phonological alterations in most of the evaluated children (Chart 2).

Although it is known that phonological alterations may be present in children aged 6 to 9 years with low vision, the aforementioned inadequacies limit the validity of this instrument for clinical speech-language pathology practice with this population. However, it should be noted that this study[17] was the only one found in this review that presented a reflection on which aspects of the visual deficit can culminate in a "delay in phonological development".

The adaptations proposed in another study[16] using direct instruments were carried out in order to favor both the visual residue and the remaining senses, through the use of toys with sounds, real objects of the child's daily life, such as food (fruits, milk and bread), in addition to the presentation of objects in their visual field, which provided greater reliability to the results obtained, considering that the proposed tasks and the material used were adequate to the visual characteristics of the child.

Another study that used a direct language assessment instrument[27] proposed an adaptation of the Clinical Evaluation of Language Fundamentals-3 (CELF-3) (Chart 2), which assesses formal aspects of expressive language, such as vocabulary, phonology, syntax, etc. and understandable language. For this tool to be applied to children with VI in the study, the actors removed items that depended on vision, which, according to

the authors themselves[27], may have compromised the research findings, since children with VI did not complete the evaluation proposed by the instrument and there are no previous studies that confirm its reliability for clinical purposes, in the absence of any of its items. Thus, it is not possible to state with certainty that schoolchildren with congenital VI perform better in formal language skills than their sighted peers (Chart 2).

It should be noted that two[17,27] of these three studies had school-age children as samples, which allows us to state that no validated direct instruments were found for children with VI in this age group, which undoubtedly represents a gap to be filled in the scientific literature, both in the field of VI and in speech-language pathology and related areas.

On the other hand, despite the division proposed by the literature[29] between direct and indirect assessment instruments, three studies[23,24,26] used the same instrument, which does not fit this classification, since it presents both questions addressed to parents and items for observation in the child's behavior, as well as tasks to be performed by the child, so that the application method will depend directly on the skills expected for each age group established by the instrument and on the way it proposes to assess it[30]. The instrument used by the three studies is the Reynell-Zinkin Developmental Scale for Young Visually Handicapped Children (Chart 2), which was validated and planned for children with VI, having been proposed in 1975 by Reynell & Zinkin[30]. This instrument consists of two parts: a) motor development; and b) mental development. Part b of the instrument was used by both studies found in this review, which cite the scale[23,24,26].

As for the areas assessed in mental development (part b of the scale), in its latest edition published in manual form by its authors[31], the instrument addresses six items of child development: social adaptation, sensorimotor comprehension, exploration of the environment, verbal comprehension and responses to sounds and expressive language (structure, vocabulary and content) [24,31,32]. However, some authors[32] believe that the Reynell-Zinkin scale has some limitations, such as few guidelines for administering and interpreting the items and the existence of very wide age ranges between them, so that scoring one item/task more or less causes a three-month increase (or decrease) in the age of specific development evaluated by a certain subscale; furthermore, it is important to emphasize that the instrument was created in the mid-1970s.

Furthermore, the raw scores of the instrument are not standardized and valid in themselves and, for this reason, they were compared, in two of the studies that used it[23,24], with the mental age scores provided by another instrument, that is, the Social Maturity Scale for Blind Preschool Children. Ages provided by the second instrument were used to the detriment of chronological ages, which favored greater reliability of the results of the Reynell-Zinkin scale[24]. The authors of the scale[31] also used it by comparing the scores obtained with the Social Maturity Scale for blind Preschool Children, which demonstrates its limitation in psychometric terms.

However, it should be noted that the other study that used the Reynell-Zinkin Developmental Scale for Young Visually Handicapped Children[26] does not mention the Social Maturity Scale for blind Preschool Children as a way of obtaining the mental ages of study participants. It is possible to assume that, as a retrospective study based on data from medical records (Chart 2), the results of the Reynell-Zinkin Developmental Scale for Young Visually Handicapped Children were already in accordance with the mental age scale recommended by the authors of the instrument, and that it was not mentioned because it was used only to adjust the scores obtained[31,32].

Despite these limitations, as it was specially designed for preschool children with VI, the aforementioned scale provides interesting strategies for assessing the oral language of this population, such as the use of concrete objects closer to the child's daily life, which will have a greater chance of to recognize them on a vocabulary test, for example[30,31].

A specific psychology protocol was also proposed in the literature[21,27], namely, the Wechsler Intelligence Scales for Children-III (WISC-III) in its verbal scale. And, despite being an intelligence assessment instrument, the instrument has important aspects for language development, such as long-term memory, auditory attention, etc. However, these studies[21,27] do not report the results of applying this scale (Chart 2, last column), since it was used only for the purpose of establishing the exclusion criteria for their samples, based on certain verbal intelligence quotient (VIQ) values.

As the joint work between speech-language pathologist and psychologists is very useful in the clinic of language development disorders, it is proposed an interaction with effective participation of the two areas, which, being worked under the interdisciplinary logic and centered on the patient, can contribute to the results and for the technical and scientific development of the topic proposed in this review[33].

A single study found in the present review[20] proposed, in addition to an instrument for indirectly assessing the pragmatic level of language, the use of an anamnesis script to be applied with the mothers (Chart 2), in order to obtain information about the global development of each child participating in the study, as well as the perinatal and postnatal periods, the minor's routine, etc. In addition to obtaining important data for the evaluation and therapeutic process, such as the previous history of the complaint, the presence or absence of associated diseases, etc., a comprehensive anamnesis allows the evaluator to understand patients in their biopsychosocial dimension, favoring a comprehensive look beyond the disability, which allows them to shift the focus from (in)capabilities to the subject's potentialities and abilities[34].

On the other hand, even studies that did not present specific instruments offered relevant aspects to be observed in the language evaluation process of children with VI using more flexible methods/techniques. Two of these studies[18,25] highlight the importance of evaluation as a longitudinal follow-up, which provides guidelines for decision-making regarding the continuity or not of a given intervention mode.

Another study[22], which also did not propose the use of assessment instruments, addressed the common repetitions in the speech of children with blindness in the process of language acquisition, in order to highlight their role in the development of congenitally blind children and problematize their status as ASD symptoms.

In the results of this study, which were obtained from transcripts of episodes of free interactions with a congenitally blind child, the author[22] reported that such repetitions aim to maintain a conversation and contact between the interlocutors (blind child and sighted adult), since they are configured as a way to obtain clarification about what was not understood, in addition to being a child's strategy to organize their thoughts and plan their actions. However, the need for further investigations

is highlighted once again, in order to verify whether this is indeed a characteristic found in these children.

CONCLUSION

Although most of the studies were carried out with blind preschool children and that their objectives were varied, most of the studies provided a comparison between children with VI and sighted. In addition, although the instruments/methods/techniques for language assessment were diverse, there was a predominance of questionnaires to parents regarding sociocommunicative skills and developmental scales; and no direct instruments were found to assess oral language levels in students with VI. Thus, from some instruments, the review provided relevant contributions and strategies to think about such an evaluation, such as the use of tasks that contemplate the remaining senses.

However, it is fundamental to validate the adaptations of instruments, which are proposed in some reviewed studies, with the population of children with VI, as well as to establish parameters of linguistic development for this population and, thus, carry out language assessments that consider their peculiarities and distinguish between "normality" and pathology. Finally, the need for future bibliographic research in more electronic databases and in books and printed journals, as well as in gray literature, is also highlighted, in order to obtain a more complete overview of the topic.

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