

RESEARCH REPORT

School and Educational Psychology

Editor

Raquel Souza Lobo Guzzo

Conflict of interest

The authors declare that there is no conflict of interest.

Received

March 26, 2021

Version final

June 21, 2023

Approved

January 30, 2024

Child development: assessment of receptive and expressive language in preschoolers

Desenvolvimento infantil: avaliação da linguagem receptiva e expressiva em pré-escolares

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Article based on the dissertation of D. M. Z. FERNANDES, entitled "Comparação da avaliação fonoaudiológica de pré-escolares com a visão de pais e professores". Universidade Estadual de Campinas, 2020.

How to cite this article: Fernandes, D. M. Z., & Lima, M. C. M. P. (2024). Child development: assessment of receptive and expressive language in preschoolers. *Estudos de Psicologia (Campinas)*, 41, e210045. <https://doi.org/10.1590/1982-0275202441e210045>

Abstract

Objective

This study evaluated the receptive and expressive language of 221 preschoolers aged 2-5 years using an assessment of language development instrument.

Method

Quantitative research with statistical analysis carried out through descriptive percentages and non-parametric Chi-square and Fishers exact tests.

Results

One hundred and four (47.06%) children had alterations, 72 (32.58%) of mild degree, 18 (8.14%) of moderate degree and 14 (6.33%) of severe degree. In the mild degree there was predominance of 3 and 4 years old children (38.89%), and the severe degree of 4 to 5 years (57.14%). There was a greater number of alterations in the expressive area of the language with 98 (44.34%) of the cases.

Conclusion

The results obtained means that evaluations with standardized instruments should be carried out in the school environment, enabling the guidance of parents and educators, minimizing negative impacts on child development and learning.

Keywords: Assessment; Child rearing; Language development.

Resumo

Objetivo

Este estudo avaliou a linguagem receptiva e expressiva de 221 crianças em idade pré-escolar, entre 2 a 5 anos de idade, utilizando um instrumento de Avaliação do Desenvolvimento da Linguagem.

Método

Pesquisa quantitativa com análise estatística realizada por meio de percentuais descritivos e testes não paramétricos Qui-quadrado e Exato de Fisher.

Resultados

Cento e quatro (47,06%) crianças apresentaram alterações, sendo 72 (32,58%) com grau leve, 18 (8,14%) moderado e 14 (6,33%) severo. Nas alterações de grau leve, houve predomínio de crianças na faixa etária de 3 a 4 anos (38,89%) e, nas de grau severo, de 4 a 5 anos (57,14%). As alterações ocorreram em maior número na área expressiva da linguagem com 98 casos (44,34%).

Conclusão

Os resultados obtidos sugerem que avaliações com instrumentos padronizados devem ser realizadas no ambiente escolar, possibilitando orientação aos pais e educadores, minimizando os impactos negativos para o desenvolvimento infantil e aprendizagem.

Palavras-chave: *Avaliação; Desenvolvimento da linguagem; Educação infantil.*

Language is a complex function that allows man to express thoughts, ideas and feelings. Its acquisition is a process that occurs in the first years of a child's life, through interaction with others and is influenced by maturational, genetic and environmental aspects (Brito & Brito, 2017).

Language development encompasses five subsystems: phonology, morphology, syntax, semantics and pragmatics. Phonology refers to the sound system of a given language, organizing the sounds of phonemes into syllables and words according to specific rules. Morphology concerns the forms of words in their different uses and constructions, allowing modification of these structures to mark the plural of nouns and verbs, verb tense and verbal inflection. Syntax is related to sentence structuring, allowing the combination of words into grammatically correct structures. Semantics is linked to the meaning transmitted through language and the meaning of words. Last but not least, pragmatics refers to the use of language according to the social contexts, involving the set of rules that guides the language intentional use (Hernandorena, 2013).

In addition to its subsystems, language can be divided into two areas, receptive and expressive. Receptive language is related to the understanding of what is being said; based on that understanding the skills of phonological awareness and communicative behaviors are developed, such as starting dialogues, taking turns and understanding stories (Virtuoso et al., 2018). The expressive language, in turn, can be described as the ability to respond verbally, that is, the child after understanding the concepts and acquiring meaningful units, will be able to communicate them to others.

Considering the milestones of language development, most children acquire their first words with communicative intent at around 12 months, beginning their linguistic phase. At this stage, there is an increase in imitation and verbal interaction; furthermore, they recognize their own names and respond to simple orders. The lexicon also expands quickly and significantly, and from the age of 18 months they begin to produce two-word sentences, understand simple orders and recognize body parts.

At 2 years of age there is a significant increase in the number of words and at 3 years of age it is already possible to understand a large part of what children say. At the age of 4, children invent stories and produce more complex sentence structures. At 5 years of age, the statements are close to those constructed by adults, and the elaboration of narratives are better structured in relation to increasing age, and, finally, at 6 years of age they already narrate and understand stories with a greater degree of complexity (Silveira et al., 2019).

The environment in which the child is inserted and the interactions they establish from an early age play a preponderant role, enabling a progressive development. Parents insert their babies into this linguistic universe, providing understanding of their mother tongue. Subsequently, children begin to attend early childhood education programs, which offer a greater experience of the world, increasing their interaction with the environment and with others, contributing to their physical, intellectual, emotional, social and linguistic development (Alves et al., 2017). The school environment provides good experiences, interactions and dialogic exchanges between children and their peers, favoring child development and especially oral language development.

The literature shows that language changes can influence the child's social and scholastic skills learning process; early identification of this issue is important, enabling an early intervention, minimizing the difficulties and worsening of learning in young adult ages (Prates & Martins, 2011). Thus, the assessment of receptive and expressive language, when carried out in the preschool population, will enable the detection of language delays and their lag areas, allowing the implementation of actions aimed at reducing damage to the child development.

Lindau et al. (2015) highlight that several methods can be used to evaluate oral language, and that their effectiveness will depend on the use of procedures appropriate to the age group and language ability of the subjects in question, which should be complemented and assessed by a professional.

However, in Brazil, there are few systematic instruments available for assessment and diagnosis in the speech therapy area, especially in the preschool population (Gurgel & Plentz, 2010).

Among the instruments developed in Brazil and frequently used by speech therapists is the Child Language Test-ABFW. This material was constructed based on the linguistic culture of the Brazilian Portuguese language to evaluate Phonology, Vocabulary, Fluency and Pragmatics in the oral language of children aged 2 to 12 years. However, such an instrument does not provide a standardized score for comparing the subject assessed and a normative sample (Lindau et al., 2015).

Another instrument is the Behavioral Observation Protocol-PROC, which aims to evaluate verbal comprehension in a discursive context of children aged 1 to 4 years old and seeking to detect early changes in expressive language (Hage et al., 2012). There is also the *Protocolo para Observação do Desenvolvimento Cognitivo e de Linguagem Expressiva* (PODCLE, Protocol for Expressive Language and Cognition Development Observation) and its revision – PODCLE-r, which aims to review zero to 7 years old children's linguistic production diversity allowing the child to be identified in his/her cognitive and expressive language and monitor him/her longitudinally during the sensorimotor period and the beginning of the preoperative period. However, there is no reference data for quantitative analysis (Flabiano et al., 2009).

To evaluate the receptive and expressive areas of language, there is a lack of technical instruments developed, standardized and validated in Brazil. Therefore, we decided to use the *Avaliação do Desenvolvimento de Linguagem* (ADL, Language Development Assessment protocol) (Menezes, 2003), standardized for Brazilian Portuguese speaking children aged 1 to 6 years and 11 months of age, used to assess basic skills for processing receptive and expressive language; this protocol is easy to apply in the school environment. In this instrument, knowledge of language content is assessed with tasks that encompass the concepts of quantity, quality (adjectives), spatial, temporal and sequence relationships. The structure of the language is assessed through tasks involving morphology and syntax.

Santos et al. (2010) investigated the association between nutritional status and the development of children's language through the application of the ADL and verified that of the total

number of children assessed, 38% presented language changes; out of this percentage four children exhibited severe changes. Despite an increased use of ADL by speech therapists in children's clinics, there are still few published studies that use the ADL to assess language in the child population, although this instrument is standardized for Brazilian children, can be easily applied even in a school environment, and covers a wide age range; in addition, it evaluates the receptive and expressive areas of language individually. Thus, this instrument meets the objectives of this study, which sought to evaluate the receptive and expressive language of a group of preschoolers aged 2 to 5 years using a standardized instrument for Brazilian Portuguese speakers.

Method

Cross-sectional research with quantitative analysis approved by the *Comitê de Ética e Pesquisa* (CEP, Ethics and Research Committee) of a public university in the interior of the State of São Paulo, number 1887842 on January 10, 2017.

Participants

The sample was characterized as non-probabilistic for convenience, consisting of 221 children aged 2 to 5 years and 11 months enrolled in an early childhood education program at an institution located in a neighborhood of high social vulnerability. Of the total number of children assessed, 115 (52.04%) were male and 106 (47.96%) were female. Regarding the age group, 52 (23.52%) were under 3 years old, 70 (31.67%) were between 3 and 4 years old, 59 (26.69%) were between 4 and 5 years old, and 40 (18.09%) were over 5 years old.

As an inclusion criterion, the voluntary participation of children aged 2 to 5 years and 11 months was determined, based on the acceptance and signing of the Free and Informed Consent Form (FICF) by parents and/or guardians. The exclusion criteria established for the study included: children under 2 years of age, diagnosed with neurological syndromes, sensory impairment, autism, using psychotropic medication and/or who were in the process of diagnostic investigation, as well as those whose parents did not sign the FICF.

A total of 391 preschoolers were invited to participate and 238 parents returned completed questionnaires and signed FICFs; a total of 17 children was removed from the study because they did not meet the inclusion criteria.

Instruments

To evaluate preschoolers, the ADL was used, a standardized and validated clinical instrument used to evaluate the acquisition and development of language in the receptive and expressive areas in Brazilian Portuguese-speaking children aged 1 to 6 years and 11 months.

This instrument is composed of two protocols: one referring to receptive language and the other referring to expressive language, which allows the assessment of each language domain separately.

The ADL kit consists of a picture handbook containing colorful illustrations relating to receptive and expressive language skills, an examiner's manual, with instructions for its application and score analysis, solid material (miniature stuffed dog, doll, spoon, plate, cup, car and three small plastic balls) and the evaluation protocols.

Children with a score of 85 to 115 points were considered to be within the normal range, 77 to 84 points indicated a mild disorder, 70 to 76 points a moderate disorder and a severe disorder when the score was less than or equal to 69 points.

Procedures

The investigation was carried out in an early childhood education institution, after approval by the institution's board based on the description of the study's objectives and procedures. The speech therapist in charge delivered to the parents, in each student's notebook, an explanatory leaflet about the research together with the FICF, and a self-reply questionnaire prepared by the investigators, seeking to collect social, economic and children's health information. The leaflet indicated that the children would be assessed by the professional during the school period using the ADL.

Data collection took place from March to November 2017, after a pre-test on a population similar to that of the survey. The assessment took place in a school room, generally on Fridays morning; the interview duration was 40 minutes on average.

The evaluation began with children enrolled in Group III, aged 5 or over, followed in descending order of age until children 2 years old. This strategy was chosen because the older schoolchildren, who were the vast majority, were already students at the institution and were accustomed to the school routine and the younger ones were still in an adaptation process.

The assessment began with the receptive language protocol, with simpler tasks, referring to the 6 months period prior to the child's chronological age, as per test instructions. After applying the test and marking the score for each task, the tables contained in the manual were used. The examiners were to transform the raw score for each area into a Standard Score (SS). The global language standard score was obtained by adding up the SS of the two protocols (receptive and expressive language).

The comparison between the scores of the two protocols separately reviewed allowed determining whether the language difficulties observed are primarily of a receptive, expressive, or global nature. It is worth mentioning that in the present study, the global score (receptive and expressive language) was reviewed and then each area was assessed separately, comparing with the gender and age variables.

The data obtained were entered into an electronic spreadsheet. Descriptive percentages and non-parametric Chi-square tests and, when necessary, Fisher's exact test were used for statistical analysis, in order to associate the gender and age variables with the ADL receptive, expressive and global language scores. The significance level adopted for the study was 5%.

Results

At first the data will be presented using the global score, comparing it with the gender and age variables. Subsequently, the assessment will be described according to the receptive and expressive areas, considering the same variables and finally, a qualitative analysis will be made of the tasks with the highest number of errors during the assessment with the ADL.

The review of the score obtained in the protocols referring to the 221 children evaluated regarding ADL receptive and expressive language, 117 (52.94%) presented results within normal limits and 104 (47.06%) experienced changes. Regarding the degree of those changes, 72 (32.58%) were mild, 18 (8.14%) moderate and 14 (6.33%) severe.

The data obtained in relation with age, were statistically significant. Children over 5 years of age had a greater number of assessments within the normal range. Considering the 72 children with mild changes, 28 (38.89%) were aged 3 to 4 years and 25 (34.72%) were aged 4 to 5 years.

A relevant fact is that, out of the 14 children who experienced severe alterations, 8 (57.14%) were aged between 4 and 5 years, as shown in Table 1.

Table 1

Comparison of preschoolers' age range and degree of language changes

Age	Changes				Total	p-value
	Normal	Mild	Moderate	Severe		
Up to 3 years	20	7	1	2	30	
	66.67	23.33	3.33	6.67		
	17.09	9.72	5.56	14.29		
3 to 4 years	34	28	6	2	70	
	48.57	40	8.57	2.86		
	29.06	38.89	33.33	14.29		
4 to 5 years	22	25	4	8	59	
	37.29	42.37	6.78	13.56		
	18.8	34.72	22.22	57.14		
>5	41	12	7	2	62	
	66.13	19.35	11.29	3.23		
	35.04	16.67	38.89	14.39		
Total	117	72	18	14	221	0.0088*

Note: * Fisher's Exact Test. Instrument used ADL.

Out of the 221 children evaluated, there was a predominance of changes in the expressive language area, with 98 (44.34%) cases and the receptive area exhibited 66 (29.86%) cases.

Comparing the receptive area score with the children's age group, the data were statistically significant, as 35 (53.03%) children aged 3 to 4 years presented a greater number of changes, as shown in Table 2.

Table 2

Comparison of the receptive language score and the age group of preschoolers

Age	Receptive Language		Total	p-value
	Normal	Changed		
< 3 years	46	6	52	
	29.68	9.09		
3-4y	35	35	70	
	22.58	53.03		
4-5y	39	20	59	
	25.16	30.3		
> 5y	35	5	40	
	22.58	7.58		
Total	155	66	221	< 0.0001

Note: * Fisher's Exact Test. Instrument used ADL.

As for expressive language, 98 (44.34%) children showed changes, with statistically significant data in relation to the age group, with 38 (38.78%) preschoolers aged 4 to 5 years showing more changes in this area, as shown in Table 3.

Table 3
Comparison of the expressive language score and the age group of preschoolers

Age	Expressive Language		Total	p-value
	Normal	Changed		
< 3 years	34 27.64	18 18.37	52	
3-4y	51 41.46	19 19.39	70	
4-5y	21 17.07	38 38.78	59	
> 5y	17 13.82	23 23.47	40	
Total	123	98	221	< 0.0001

Note: * Fisher's Exact Test. Instrument used ADL.

After quantitative analysis of the data, the tasks with the highest number of errors by preschoolers in the receptive and expressive areas were listed among the degrees of change (mild, moderate and severe), also considering the age group. The task statement to be evaluated was transcribed according to the application protocol, as described in Table 4.

Table 4
Tasks in the receptive and expressive areas with the highest number of errors by preschoolers

Degree of change	Age group	Most difficult tasks	Example
Mild			
Receptive Area	> 5 years	Understanding sentences in the passive voice; Quantity concepts.	LR 33: "Show the boy who was pushed by the girl"; LR34: "Show half of the orange".
Expressive Area	3 to 4 years	Acquisition of the regular plural	LE24: "Here is one car, here are two?"
	4 to 5 years	Acquisition of the regular plural; Using adjectives to describe people and objects.	LE: "Here is one car, here are two?" LE28: "Take a good look at these girls, this girl is happy with her new and beautiful dress. And this one, how is she?"
	>5 years	Tell a story through comic figures.	LE 36: "This story is about a boy who wants to go to the football game with his father. Look at the comics and tell me a story".
Moderate			
Receptive Area	3 to 4 years	Understanding the personal pronoun; Make deductions and show the correct figure after listening to a story.	LR24: "Show the picture where she is crying" LR22: "If Tiago leaves the house he will be all wet. How's the weather outside?"
	>5 years	Passive voice; Quantity concepts.	LR 33: "Show the boy who was pushed by the girl"; LR34: "Joana cut an orange in half, show half the orange."
Expressive Area	3 to 4 years	Regular Plural	LE24: "Here is one car, here are two?"
	>5 years	Use of the interrogative pronoun "when"; Tell a story through comics.	LE31: "What do you do when you go to brush your teeth?" LE 36: "This story is about a boy who wants to go to the football game with his father. Look at the comics and tell me a story".

Table 4*Tasks in the receptive and expressive areas with the highest number of errors by preschoolers*

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Degree of change	Age group	Most difficult tasks	Example
		Severe	
Receptive Area	4 to 5 years	Color identification; Understanding nouns plus 2 adjectives; Quantity concepts.	LR28: "Look at these balls, show the red color ball"; LR31: "Show the furry white cat"; LR32: "Count the lollipops in each cup. Which of these cups has three lollipops?".
Expressive Area	4 to 5 years	Memory for sentences; Respond correctly to requests; Use of the interrogative pronoun "when".	LE26: Repeat the phrase: "Lucas trained well and won the game"; LE27: "Dog, cat and horse - they are all animals. Do you know what they are: train, doll, ball and cart? LE31: "What do you do when you go to brush your teeth?"

Note: Instrument used ADL.

Discussion

Among the children evaluated in the present study, those over 5 years of age presented a greater number of evaluations that were within the normal range; this may be due to the process of acquiring language subsystems, that is, the greatest changes in younger children are related to the process of acquisition; with increasing age, there is an expansion of vocabulary and greater grammatical complexity, which would contribute to an increase in test scores and results.

The data found in this study corroborate those of Cáceres-Assençõ et al. (2018), who observed a progressive increase in expressive vocabulary proportional to age; in fact 6-year-old children showed superior performance compared to 5-year-old children; Moretti et al. (2017) found higher scores in emissive and receptive tests, as the age and socioeconomic level of the children participating in their study increased.

Regarding the high number of changes in language development (47%), Santos et al. (2010), also found a high percentage of changes (38%) when investigating the association between nutritional status and language development in children aged 4 to 6 years and 11 months through the application of ADL. However, the authors do not describe the degree of changes and/or the area of language affected. In another study using the same instrument, Gouveia et al. (2020) reviewed the medical records of children aged 18 to 36 months who were followed up by a multidisciplinary team for the purpose of evaluation and family guidance, and of the 66 children evaluated, 36% presented language changes.

As to the language areas, a greater number of changes were observed in the expressive area, which is in line with the study by Silva et al. (2014). These data can be explained considering the chronology of language development, because as children progress in their development, the demands grow, especially regarding expressive aspects, since children must expand their vocabulary, evolving in terms of grammar and of symbolism mastery.

Puglisi and Befi-Lopes, (2016) highlight that children aged 4 to 6 years expand their vocabulary depending on their age, which is related to the development of morphological skills and language understanding. Therefore, it is essential that the assessment of children's language includes the receptive and expressive areas from an early age, allowing the detection of possible changes; these findings should drive appropriate interventions to mitigate or even eliminate these difficulties.

In the receptive area, Virtuozzo et al. (2018) evaluated preschoolers from a public school aged 2 to 3 years and reported that 63.33% of the participating children obtained below average results. These data differ from the findings of our study, which showed a greater number of changes in the

age group of 3 to 4 years; however, this divergence may be related to the instrument used and the number of preschoolers evaluated.

With regard the age group, preschoolers between 3 and 4 years of age, followed by those aged 4 to 5, presented a greater number of mild changes, which may be related to the language acquisition phase and the age of entry into school. In fact, Law no. 12,796 (Presidência da República, 2013) set the mandatory inclusion of children in daycare centers when 4 years old. Therefore, early childhood education ceases to have a unique and exclusive nature of care, becoming a stage of great importance in the child's school life, influencing child and language development, since this is an evolutionary process, in which the children build hypotheses and carry out various discursive exchanges with their peers and other reference adults.

It is possible that a child aged 3 years, when in a school setting, may present initial difficulties regarding this environment demands which are quite different from the family environment the only one to which the child has been exposed so far. At school, the child will have contact with other children of different age groups and reference adults, routine with different proposals, having access to different settings to be explored, increasing their understanding of the world, which will reflect on their development and should therefore use their language subsystems to understand the demands that arise in this new space, acting and expressing themselves therein.

Hence, actions that favor this process must be present in the school environment and the teacher, through playful and targeted activities, can, in a pleasurable way, provide meaningful learning, in addition to establishing a bond with the children, promoting moments of interaction, communication and socialization (Trevezani et al., 2021).

Back et al. (2019) reinforce the importance of school for language development, as it provides children with fundamental situations for the evolution of communication and language, as well as the role played by the teacher, who, in addition to being a reference adult and mediator in this framework, can observe and identify possible language difficulties.

In the present study, 72 children presented a few difficulties in the test which was considered a warning sign; the educators at the institution where the research was carried out were instructed regarding the aspects relating to language acquisition and development and potential activities were suggested that could be implemented in a school environment, since the first years of a child's life are extremely important for the child and for the language development, considering the number of neuronal connections, brain plasticity and acquisition of new skills and functions.

It is worth mentioning that the children participating in the study who presented assessments indicating moderate and severe changes were referred for evaluation and treatment an external professional speech therapist, from the public or private network, and the parents and teachers were duly guided by another speech therapist who carried out the investigation.

Children aged 4 to 5 years who have language problems should be looked at with greater attention and care, as language changes may have an impact on the acquisition and development of future skills such as reading and writing. Some studies also report that biological risk factors, such as prematurity and low birth weight, environmental and socioeconomic factors, influence the child's development and may hamper cognitive abilities and normal language development.

In view of the above, the importance of carrying out language assessments in children, especially in the pre-school phase, is evident; changes ought to be detected early in this process, thus helping difficulties to be worked on and losses alleviated, or even remedied, in future stages (Cáceres-Assenço et al., 2018).

Regarding the tasks used in ADL, we observed that those involving the acquisition of the plural, understanding the passive voice, pronouns, concepts of quantity and telling stories through pictures resulted in a greater number of errors on the part of the children evaluated.

With regard to the acquisition and productive use of number morphology in Brazilian Portuguese, Befi-Lopes et al. (2009) evaluated 74 children aged 3 to 6 years and 11 months and found that those with normal language development were able to identify the grammatical number morpheme and its semantic information from the age of 3, showing improvement with age, becoming productive at around 5 years of age. Regarding the plural production, the answers were detected in children aged 5 and over.

Regarding the passive voice, Borer and Wexler (1987) state that children with the expected development corresponding to the age group will understand the structure of the passive voice from 4 to 5 years of age, and that 6 years old Brazilian Portuguese speakers will understand long passive forms better.

As for pronouns, they play an important role in communication by identifying specific individuals in the discursive framework; besides, pronouns change depending on who is speaking. Children play an active role in language acquisition, as they formulate hypotheses regarding deictic terms and strategies that can be used in the communication with other people. The basic acquisition of such terms occurs, on average, until the age of 3, initially involving first and second person pronouns, with the complete acquisition of this system occurring by the age of 8 (Issler, 2013). In this regard, Cruz (2008) states that for this process to occur as expected, it is important that parents, in dialogical situations with the child, use different forms of reference, nominal and pronominal, using different forms to express deictic roles in communicative situations.

The activities of telling and listening to stories are common practices in early childhood education, contributing to the process of acquisition and development of oral language, especially with regard to vocabulary expansion. Furthermore, children's frequent contact with books is linked to the good development of receptive vocabulary and initial reading skills (Virtuozo et al., 2018).

Motta et al. (2006) suggest that narratives can be included in the process of assessing children's language, as they provide data on possible language difficulties that could impact future school performance. Costa et al. (2018) indicate that at the age of 5, children have greater ability to structure narratives and at 6 they understand and narrate them more skillfully, evolving throughout their school life.

Stories make up the daily lives of young children, so when they have difficulty telling or understanding them, they can miss important aspects of communication and learning (Miller et al., 2001). The children aged 5 to 6 years assessed in our study had difficulties in telling a story through pictures. Therefore, it is important that such activities are included in everyday school and family life, as the act of telling stories from books or pictures plays an important role in language development and should, therefore, be encouraged by generating interest in children.

Finally, the ADL proved to be an instrument that is easy to apply, especially in schools, and can be used with a wide age range children; however, it is worth highlighting that in our bibliographical survey we found few studies that used ADL as a research tool to evaluate the receptive and expressive domains of language, which is a limiting factor for further discussion of the this study outcome.

Conclusion

Among the preschool children assessed, those aged 3 to 4 years had a greater number of mild difficulties, while those aged 4 to 5 years presented more severe language changes. Regarding the area of language affected, expressive was the one with the highest number of evaluations below normal. Thus, considering the critical period for language acquisition and development, the present study highlighted the importance of carrying out language assessments in preschoolers through the use of standardized instruments. Such assessments, when carried out in schools, identify possible language changes, enabling adequate guidance for parents and teachers, as well as helping to refer children for treatment, minimizing negative impacts on the child development and learning processes.

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