LINGUISTIC, FAMILIAL AND GENDER PROFILE OF STUDENTS DIAGNOSED WITH DYSLEXIA OF A SCHOOL CLINIC

Perfil linguístico, familial e do gênero de escolares com diagnóstico de dislexia de uma clínica escola

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ABSTRACT

Purpose: to define the profile of patients diagnosed with Dyslexia in terms of gender, familial recurrence for communication disorders or difficulties at school, presence of oral language disorders and the presence of changes in the skills of phonological working memory, visual memory and phonological awareness in the first clinical assessment, through analysis of charts of individuals. **Methods:** we conducted a retrospective study cross-sectional study through analysis of charts of the last ten years, from 2001 to 2011, in which we investigated the clinical histories and interdisciplinary review of patients diagnosed with Dyslexia. **Result:** through a sample of 23 medical records, it was found that 82% of patients belong to male subjects; 60.9% had familial recurrence for the presence of relatives with communication disorders or learning difficulties; 47.8% of children diagnosed with dyslexia reported suffering from some type of change in oral language; 82.6% of surveyed possessed alteration of phonological working memory, phonological awareness 82.6% and 39.1% of visual memory. **Conclusion:** it was possible to verify that the profile of patients diagnosed with dyslexia, Clinical School at the home institution, is characterized, preferentially by male gender, the presence of familial recurrence for communication disorders or learning difficulties, and present a modification of phonological working memory and phonological awareness during the first clinical assessment.

KEYWORDS: Dyslexia; Language; Learning

INTRODUCTION

Memory plays a fundamental role in learning process, being necessary both memories, short term and long term. Thus, for writing process it becomes necessary to recover lexical elements by means phonological or indirectly, also by visual orthographic means, that is, to make a recall of previously acquired knowledge and store them through memory, such as: graphemes, phonemes and / or words. Thus, memory is required for learning writing[1]. To understand reading it is necessary to have integrity of the central and peripheral nervous systems, and for satisfactory reading, some prerequisites are also required: selective and sustained attention, discrimination and auditory perception, short and long term memory and also phonological awareness[2].

For the reading process, visual memory is also essential. It is through the visual discrimination, attention and memory storage of graphical information which makes the recognition of the grapheme, recognition of graphical spelling is necessary, considering that visual processing is complementary to the phonological processing[3]. Visual memory is important for the field of rules that will determine the spelling of the word, considering that the students in visual dictation have better performance than on verbal dictation, due to the request of short-term memory[4].

Dyslexia, a specific reading disability, is characterized by a lower performance than expected for mental age, socioeconomic status and schooling

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instruction, and can affect the processes of decoding and reading comprehension [5,6]. Thus, a person presents normal intelligence, phonological disorder, failure in semantic, syntactic and pragmatic skills, presenting impaired narrative ability in the process of recounting stories, correctly fluency difficulty in decoding and spelling skills, in addition to changes in processing and auditory and visual information.[7,8]

It was evidenced in the literature, familial recurrence for dislexia[9]. Studies show that dyslexia has a major familial incidence[10], which is an important risk factor for diagnosis[11,12]. A high prevalence of this diagnosis in males was observed [9, 10].

According to some authors, during the diagnosis of children with dyslexia, some difficulties were related to the evocation of memory. The child is able to understand the central idea of the readings, but can not remember the details of texts[8]. Other studies have reported that there is evidence of changes in executive functions in children with dyslexia, leading to lower performance in working memory, verbal fluency and figures, and inhibitory control with partially impaired ability in problem solving and ability to concept formation without commitment[13]. Students with dyslexia can also present a lower performance on tasks of sustained visual attention and in executive components of cognitive inhibition and flexibility, without impairing planning[14].

It was pointed out that dyslexic children do not present lower intelligence than normal children, but a low capacity of auditory short-term memory or phonological working memory[15]. Some authors found that difficulties in auditory processing abilities of attention, encoding, organization and integration of auditory information are those involving the use of phonological processing skills[16]. Thus, phonological processing is fundamental for satisfactory reading performance[17]. Another study states that children with dyslexia present difficulties in processing working memory, besides phonological and orthographic alterations[18]. The main difficulty in dyslexia relates to phonological processing in relation to the ability of phonological awareness, phonological working memory and rapid verbal naming, resulting in written language alterations[19].

Phonological awareness is a skill of explicit phonological processing, which refers to the ability to reflect on the sounds of words and manipulate them. This ability predicts performance in reading and writing. It was also found that other skills that predict this performance are: verbal short-term memory and long-term memory that are part of the implicit phonological processing [20]. There are cases of dyslexia in which problems are observed in visual processing[21]. There is evidence that brain dysfunctions in the angular gyrus or surroundings, which are areas involved in storing words, may lead to superficial dyslexia or visual.

There are three types of dyslexia: disphonetics or phonological, derived from an inability to apply the letter-sound relationship and is due to a deficit in phonological processing[6,21], a result of difficulty in speech perception abilities, which hinders the development of phonological awareness and therefore phonemic segmentation of speech which leads to problems in graphophonemic de/encoding, required to use the phonological route (sequence), or impairs reading non-familiar words[22.] The visual**,** or superficial dyslexia, which is qualified by the inability to recognize words as a whole and results from a deficit in visual processing and, finally, the mixed dyslexia, which is characterized by difficulties in auditory processing and visual processing [6,23].

Thus, it becomes necessary to study the linguistic skills as well as the study of familial recurrence and incidence according to gender diagnosis of dyslexia in scholars.

This research aims to define the profile of patients diagnosed with dyslexia, as: gender, familial recurrence of communication disorders or difficulties at school, presence of altered oral language, presence of alterations in the abilities of phonological working memory, visual memory and phonological awareness in clinical assessment.

METHODS

The analyzes followed the criteria of the FOB-USP Committee of Ethics in Research - Bauru, and this study was made only after the approval of the Committee, under protocol n°192/2009.

The research was conducted at the Speech Pathology Clinic, Faculty of Dentistry of Bauru, University of São Paulo.

A retrospective cross-sectional study through analysis of medical records of the last ten years was carried out in the period 2001-2011, and clinical histories (history) (anamnesis) and the first interdisciplinary review of patients diagnosed with dyslexia were investigated. Patient medical charts were selected from inclusion criterion; being established diagnosis according to DSM-IV-TR[24] and ICD10[25] criteria, and proven by the interdisciplinary assessment of the Speech Pathology Clinic, FOB / USP.

The exclusion criteria selected, were: medical records non pertinent to Reading and Writing, records with incomplete interdisciplinary assessment, with inconclusive diagnoses, of patients with other associated problems such as attention deficit disorder and hyperactivity.

From the analysis of records of patients who were in attendance at the prescribed period, the following data were collected: gender, education, presence of language disorders, familial recurrence of communication disorders or learning difficulties, presence of alterations during the first evaluation of phonological working memory, visual memory and phonological awareness.

During the study of the medical records, it was observed that, for the assessment of phonological awareness, phonological working memory and visual memory, the following instruments were applied: "Profile of Phonological Abilities Profile"[26] to assess the phonological awareness, the "Phonological Working Memory Test – Non-words and Digits"[27] to assess phonological working memory, and "Visual Memory Test of the Luria-Nebraska Neuropsychological Battery [28] " to assess visual memory.

Data were analyzed using tables, graphs and descriptive statistics. Statistical analysis was performed from the employment of the following: chi-square test and proportions test. The level of significance for this study was 0.05 (5%).

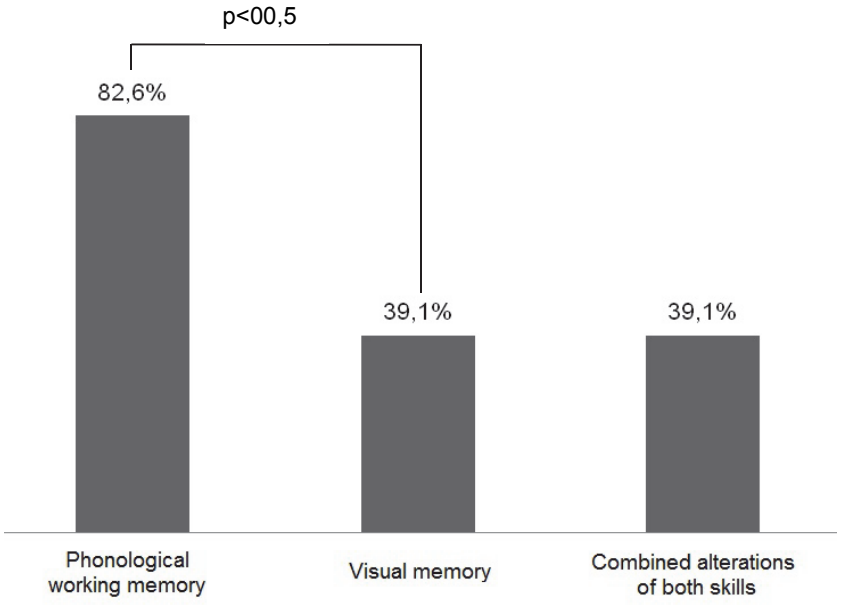
RESULTS

Records for the years 2001 to 2011, of students diagnosed with dyslexia by the Speech Pathology Clinic of the Institution were analyzed. To do so, through the general registration of 11,011 clinic patients; the medical records comprised a sample of 188 records concerning to the area of reading and writing. Each medical record was carefully analyzed, following the inclusion and exclusion criteria described in the methodology and thus, a sample of 23 medical records of patients diagnosed with dyslexia by the Speech Pathology Clinic was selected.

In the medical records of patients diagnosed with dyslexia, it was possible to verify through the anamnesis, that 82% of the patients are males, whereas 60.9% of the sample presented familial recurrence concerning the presence of relatives with communication disorders or learning difficulties and 47.8% of the parents of children diagnosed with dyslexia, reported that their children had suffered some kind of alteration in oral language.

The chi-square test was applied to compare the alterations in phonological working memory, visual memory and phonological awareness data (comparing the three) and the value of $p = 0.001$, was found, showing a statistically significant difference.

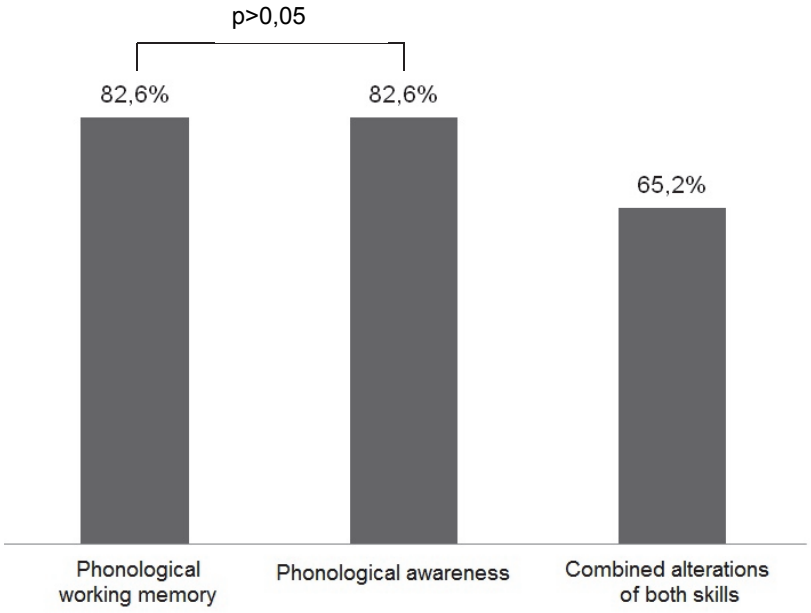
Data from the first speech evaluation of these records were also analyzed. Figure 1 shows the graph of the alteration percentage in phonological working memory, visual memory and the alterations combination of both memories. Through statistical analysis, a statistically significant difference was found, between the incidence of the two memories in the sample, as $p < 0.05$. Through the analysis of this graph, the phonological working memory was found to be altered in a larger number of dyslexic surveyed. It also allows the analysis of the alterations percentage combined both memories, to be equal to the percentage of alterations in visual memory, and the data collected was verified that this similarity is not a coincidence, since all students with visual memory impairment also presented altered phonological working memory , while not all students with altered phonological working memory presented altered visual memory.



Chi-square test and proportions test

Figure 1 - Graphical representation of the percentage of dyslexics with alterations in phonological working memory, visual memory and combined alterations of both skills

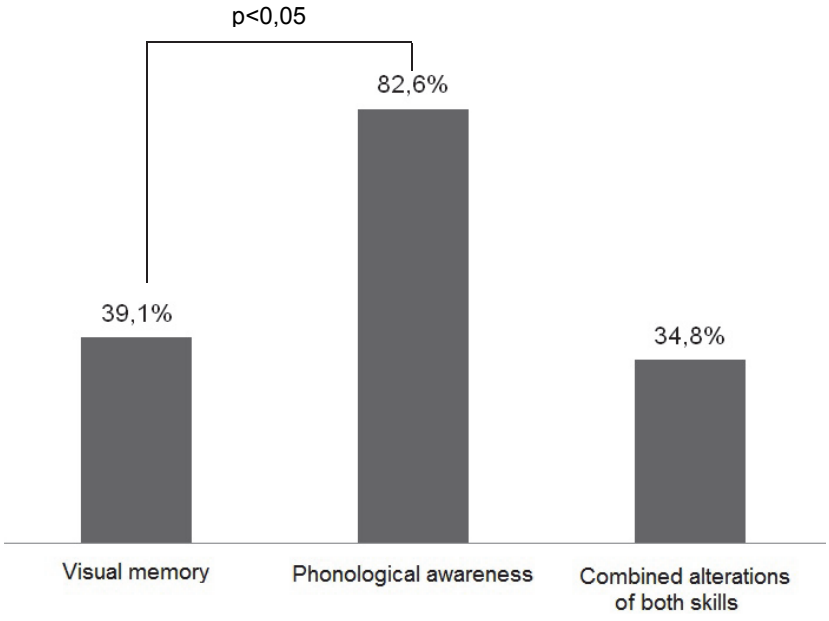
Figure 2 shows the graph of the alterations percentage in phonological working memory, phonological awareness and combined alterations of the two skills. Through statistical analysis, there was not statistically significant difference between the incidence of the two skills in the sample, since p> 0.05, Through this graph is becomes possible to observe that the phonological awareness has become so altered in subjects screened, concerning the phonological working memory, but not all individuals with abnormal phonological working memory present alterations in phonological awareness.



Chi-square test and proportions test

Figure 2 - Graphical representation of the percentage of dyslexics with alterations in phonological working memory, phonological awareness and combined alterations of both skills

Figure 3 shows the percentage of alterations graph of visual memory, phonological awareness and alterations, combined these two skills. It is possible to verify that phonological awareness is abnormal in a larger amount of individuals than in visual memory. Using the significance level of 0.05, it was found that there was significant difference between the incidence of the two skills in the sample, as p <0.05. It is still possible to verify that students with alterations in visual memory may also present alterations in phonological awareness.



Chi-square test and proportions test

Figure 3 - Graphical representation of the percentage of dyslexics with alterations in visual memory, phonological awareness and combined alterations of both skills

DISCUSSION

The incidence of dyslexia in the general population occurs in approximately 10-15 % [29], and this fact may explain the small survey sample. Incomplete records and those who had no diagnosis established according to the DSM –IV-TR[24] and ICD-10[25], were excluded. The same authors reported that , as well as other language disorders, dyslexia is more prevalent in males, but within the same bibliographic survey referring to males as more prevalent, may be related to behavioral problems which are more frequent in boys than girls, with scholastic difficulties[30]. Other studies claim that X chromosome increases the risk for dyslexia, which could explain why males are more affected or more severely affected than females, suggesting that dyslexia can be related to chromosome X[10]. According to another author, "behavioral geneticists have shown that there is a 50% probability of a boy becoming dyslexic if his father is dyslexic (about 40 % if his mother is affected)"[19]. The prevalence of males in the sample is consistent with studies investigated, but it was not possible to verify whether this is due to higher referral of boys than girls, by the teachers.

There is evidence that dyslexia is hereditary, and the difficulty of reading is not inherited, but aspects of processing linguage[19]. In the present study sample, it was found in more than half of anamnesis, the presence of familial recurrence, in which at least one family member had learning difficulties or oral language alterations; which is in agreement with the study that surveyed a sample of relatives of dyslexics, in which at least one family member had a complaint or learning difficulty similar to dyslexia learning, claiming that dyslexia has significant familial impact[10].

Part of the sample reported alterations in oral language. It was found that the occurrence of previous difficulties in oral language, such as phonological difficulties and not articulation, may impair reading and writing learning[3]. Other authors have demonstrated that oral language impairments

may be a risk factor for phonological processing, and not only those commitments that remain after six years of age, but those which have already been solved, may interfere on the child literacy. They also demonstrate that oral language difficulties resulting from alterations in phonological processing are established as a risk factor for dislexia[32].

Another study has raised the concern of diagnosis and differentiated practice of teacher with student, but not only in elementary school, but also in secondary education, while pointing to the fact that when there is no diagnosis and appropriate intervention, school failure can lead the student to fail or to truancy, leading to behavioral problems in the labor market. Therefore, diagnosis and early intervention are essential to minimize the difficulties that may occur in the academic life of dysléxics[33]. The same author has showed the importance of creating pubic policies to enable the identification of dyslexia in public schools, in addition to allowing adequate school support for this population[33].

As noted in the literature review for this research, there is a strong relationship between alterations in phonological awareness and alterations in phonological working memory in individuals with dyslexia, and this finding was also observed in the samples. Through a literature review, the authors observed that memory disorders of short and long term, both auditory and visual memory, can be found in children with dislexia[6]. Studies showed that the phonological deficit can be observed through late skills phonological working memory and phonological awareness which can last until adult life[19]. The literature also shows that poor readers have significantly lower performance than good readers in writing tasks, phonological awareness, vocabulary, phonological working memory and short-term visual memory, confirming that the processes involved in reading and writing are closely related to phonological processing, including phonological awareness and phonological working memory, and these skills are prerequisites for written language acquisition[22]. There are also reports in the literature, evidencing that children with dyslexia may present alterations in executive functions, leading to a lower performance in some skills, among them the ability of phonological working memory[13]. Another study reported that dyslexics present alterations of phonological awareness and auditory temporal processing, whose performance may have been interfered by the phonological, cognitive skills and also by phonological working memory fonológica[34]. Such alterations may result from difficulties in working memory processing, besides phonological and orthographic alterations[19]. The data found in the analysis of medical records were compatible with the data published in the literature, which state that the alterations in phonological processing are present in individuals with dyslexia, since they present alterations in phonological working memory and phonological awareness, and these skills are altered in a significant amount of individuals surveyed.

According to the data, it was also observed that the prevalence of alterations in visual memory is low, when compared to other searched skills, but their presence reinforces the idea that visual memory can be an exception within the abilities of visual processing, in correlation with reading and writing performance[35]. Students with dyslexia may present auditory and visual alterations in spatial orientation and attention, which can lead to difficulty in the selection and perception of stimuli, and such changes may distort the development of phonological and orthographic representations[36]. Difficulties in visual processing, such as visual memory alterations, may emphasize the difficulties presented by dyslexics[37]. Another study shows the importance of this skill for the domain of rules that will determine the spelling of the word[4].

Thus, this study identifies the importance of proper diagnosis, taking into account the linguistic, familial and gender profile of students with dyslexia. And also confirms the evidence found in the literature, for the necessity of audiologists and teachers, to employ intervention programs with phonological basis, focusing on phonological working memory and visual memory, and letter-sound relationship, in order to identify and intervene previously to treat dyslexia.

CONCLUSIONS

The data obtained in this study, through the analysis of records of individuals diagnosed with dyslexia, were compatible with the data published in the literature, even having a small sample. The survey results allow us to conclude that the profile of patients diagnosed with dyslexia by the Speech Pathology School Clinic, from the home institution, is preferably characterized by male gender, presence of familial recurrence of communication disorders or learning difficulties, and due to presenting phonological working memory and phonological awareness alterations, during the first speech evaluation.

RESUMO

Objetivo: traçar o perfil dos pacientes com diagnóstico de dislexia quanto ao gênero, recorrência familial para distúrbios da comunicação ou dificuldade escolar, presença de alteração de linguagem oral e quanto à presença de alteração nas habilidades de memória de trabalho fonológica, memória visual e consciência fonológica na primeira avaliação fonoaudiológica, por meio da análise de prontuários de indivíduos. **Métodos:** foi realizado um estudo transversal retrospectivo por meio de análise de prontuários dos últimos dez anos, no período de 2001 a 2011, em que foram investigadas as histórias clínicas e a primeira avaliação interdisciplinar de pacientes diagnosticados com dislexia. **Resultados:** por meio de uma amostra de 23 prontuários, foi verificado que 82% dos pacientes pertencem a indivíduos do gênero masculino; 60,9% possuíam recorrência familial quanto à presença de familiares com distúrbios da comunicação ou dificuldades escolares; 47,8% dos escolares com diagnóstico de dislexia relataram sofrer de algum tipo de alteração de linguagem oral; 82,6% dos pesquisados possuíam alteração de memória de trabalho fonológica; 82,6% de consciência fonológica e 39,1% de memória visual. **Conclusão:** o perfil dos pacientes diagnosticados com dislexia, na Clínica Escola da instituição de origem, se caracteriza, preferencialmente pelo gênero masculino, pela presença de recorrência familial para distúrbios da comunicação ou dificuldades escolares e por apresentarem alteração de memória de trabalho fonológica e consciência fonológica durante a primeira avaliação fonoaudiológica.

DESCRITORES: Dislexia; Linguagem; Aprendizagem

REFERENCES

1. Souza ARM, Sisto FF. Dificuldade de aprendizagem em escrita, memória e contradições. Psicol. Esc. Educ.2001;5(2):39-47.

2. Sauer L, Pereira LD, Ciasca SM, Pestun M, Guerreiro MM. Processamento auditivo e SPECT em crianças com dislexia. Arq. Neuro-Psiquiatr. 2006;64(1):108-11.

3. Pino M, Bravo L. La Memoria Visual como Predictor del Aprendizaje de la Lectura. Psykhe. 2005;14(1):47-53.

4. Barbosa PMF, Bernardes NGB, Misorelli MI, Chiappetta ALML. Relação da memória visual com o desempenho ortográfico de crianças de 2ª e 3ª séries do ensino fundamental. Rev. CEFAC. 2010;12(4):598-607.

5. Capellini SA. Distúrbios de aprendizagem versus dislexia. In: Ferreira LP, Befi-Lopes DM, Limongi SCO. Tratado de Fonoaudiologia, São Paulo: Roca; 2004. p. 862-76.

6. Olmino EFN, Santana MSR. Dislexia: definição e caracterização. In: SCENCULT - Simpósio Cientifico Cultural, 6, 2011, Mato Grosso do Sul, Anais. Mato Grosso do Sul: SCENCULT, 2011.

7. Germano GD, Capellini SA. Eficácia do programa de remediação auditivo-visual computadorizado em escolares com dislexia. Pró-Fono Rev. Atual. Cient. 2008;20(4):237-42.

8. Deuschle VP, Cechella AC. O déficit em consciência fonológica e sua relação com a dislexia: diagnóstico e intervenção. Rev. CEFAC. 2009;12(2):194-200.

9. Prado DGA, Armigliato ME, Salgado C, Lopes-Herrera SA, Crenitte PAP. Dislexia e distúrbio de aprendizagem: histórico famílial. Distúrb Comum. 2012;24(1):77-84.

10. Capellini SA, Padula NAMR, Santos LCA, Lourenceti MD, Carrenho EH, Ribeiro LA. Desempenho em consciência fonológica, memória operacional, leitura e escrita na dislexia familial. Pró-Fono Rev. de Atual. Cient. 2007;19(4):374-80.

11. Scarborough HS. Very early language deficits in dyslexic children. Child Dev. 1990;61(6):1728-43.

12. Meng H, Smith SD, Hager K, Held M, Liu J, Olson RK et al. DCDC2 is associated with reading disabilities and modulates neuronal development in the brain. Proc. Nat. Acad. Sci, 2005;102(47):17053-8.

13. Dias NM, Menezes A, Seabra AG. Alterações das funções executivas em crianças e adolescentes. Estudos interdisciplinares em Psicologia. 2010;1:80-95.

14. Lima RF, Travaini PP, Salgado-Azoni CA, Ciasca, SM. Atención sostenida visual y funciones ejecutivas en niños con dislexia de desarrollo. Anales de psicología 2012;28(1):66-70.

15. Furbeta, TDC, Felippe ACN. Simplified auditory processing test and difficulties in reading and spelling. Pró-Fono Rev Atual Cient. 2005;17(1):11-8.
16. Pinheiro FH, Germano GD, Capellini SA. Caracterização do desempenho em habilidades auditivas e fonológicas em escolares com dislexia do desenvolvimento. Tecer. 2011;4:1-13.
17. Jiménez JE, Guzmán R, Ortiz R, Díaz A, Estévez A, García E, et al. Validez discriminante de La Batería Multemedia Sicole-R-Primaria para la evaluación de procesos cognitivos asociados a la dislexia. Revista de Investigación Educativa. 2009;27(1):49-71.
18. Capellini SA, Germano GD, Cardoso ACV. Relação entre habilidades auditivas e fonológicas em crianças com dislexia do desenvolvimento. Psicol. Esc. Educ. (Impr.). 2008;12(1):235-51.
19. Snowling M. Dislexia desenvolvimental: uma introdução e visão teórica geral. In: Snowling M, Stackhouse J. Dislexia Fala e Linguagem - Um manual do profissional. Artmed; 2004. p. 11-21.
20. Defior S, Serrano F. Procesos fonológicos explícitos e implícitos, lectura y dislexia. Revista Neuropsicología, Neuropsiquiatría y Neurociencias, Colombia. 2011;11(1):79-94.
21. Pinheiro ÂMV. Dislexia do desenvolvimento: perspectivas cognitivo-neuropsicológicas. Athos & Ethos, 2002;2:1-14.
22. Capovilla AGS, Capovilla FC, Suiter I. Processamento cognitivo em crianças com e sem dificuldades de leitura. Psicol. Estud. 2004;9(3):449-58.
23. Boder E. Developmental dyslexia: a diagnostic approach based on three atypical reading-spelling patterns. Developmental Medicine and Child Neurology. 1973;15:663-973.
24. American Psychiatric Association (APA). DSM-IV: Manual Diagnóstico e Estatístico de Transtornos mentais. 4 ed. rev trad. Caludia Dornelles. Porto Alegre: Artes Médicas; 2002.
25. Organização Mundial da Saude. Classificação de Transtornos mentais e de comportamento da CID-10: descrições clinicas e diretrizes diagnósticas. Porto Alegre: Editora Artes Médicas; 1993.

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26. Alvarez AMMA, Carvalho IAM, Caetano AL. Perfil de habilidades fonológicas. São Paulo: Via Lettera, 1998.
27. Hage SRV, Grivol MA. Desempenho de crianças normais falantes do português em prova de memória de trabalho fonológica. Cad.Comun. Ling. 2009;1:11-22.
28. Lima RF, Mello RJL, Massoni I, Riechi TIJS, Ciasca SM. Teste Luria Nebraska-C. Campinas: Departamento de Neurologia, Faculdade de Ciências Médicas, Universidade de Campinas; 2005.
29. Ianhez ME, Nico, M.A. Nem sempre é o que parece: como enfrentar a dislexia e os fracassos escolares. São Paulo: Alegro;2002.
30. Salles JF, Parente MAMP, Machado SS. As dislexias de desenvolvimento: aspectos neuropsicológicos e cognitivos. Interações. 2004;9(17):109-32.
31. Schirmer CR, Fontoura DR, Nunes ML. Distúrbios da aquisição da linguagem e da aprendizagem. J. Pediatr. 2004;80(2):95-103.
32. Tannock R. Desenvolvimento da linguagem e alfabetização: Comentários sobre Beitchman e Cohen. In: Tremblay RE, Boivin M, Peters RDEV, eds. Enciclopédia sobre o Desenvolvimento na Primeira Infância [on-line]. Montreal, Quebec: Centre of Excellence for Early Childhood Development; 2011 [acesso em 10 jul. 2011]:1-5. Disponível em: http://www.enciclopedia-crianca.com/documents/TannockPRTxp1.pdf.
33. Souza EC. O disléxico com sujeito do processo ensino-aprendizagem. Contrapontos. 2008;8(3):423-32.
34. Murphy CFB, Schochat E. Correlações entre leitura, consciência fonológica e processamento temporal auditivo. Pró- Pró-Fono Rev Atual Cient. 2009;21(1):8-13.
35. Capovilla AGS, Gütschow CRD, Capovilla, FC. Habilidades cognitivas que predizem competência de leitura e escrita. Psicol. Teor. Prat. 2004;6(2):13-26.
36. Facoetti A, Lorusso ML, Paganoni P, Cattaneo C, Galli R, Umiltà C et al. Auditory and visual automatic attention deficits in developmental dyslexia. Cognitive Brain Research. 2003;16(2):185-91.
37. Machado AC, Capellini SA. Caracterização do desempenho de crianças com dislexia do desenvolvimento em tarefas de escrita. Rev. Bras. Cresc. e Desenv. Hum. 2011;21(1):132-8.
38. Fukuda MTM, Capellini SA. Treinamento de habilidades fonológicas e correspondência grafema-fonema em crianças de risco para dislexia. Rev CEFAC. 2011;13(2):227-35