

BEHAVIOR PROBLEMS AND DEPRESSIVE SYMPTOMS IN DEVELOPMENTAL DYSLEXIA: RISK ASSESSMENT IN BRAZILIAN STUDENTS

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Abstract

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Objective: To investigate if students with developmental dyslexia (DD) have more behavior problems and depressive symptoms than students without learning difficulties.

Method: Participants were 61 students, aged 7-14 years, including 31 with interdisciplinary DD diagnosis and 30 without learning disabilities. We collected data from parents, using the children's behavior checklist (CBCL), and from students, using the children's depression inventory (CDI).

Results: The DD group had higher CBCL averages for anxiety, depression, withdrawal, rule-breaking behaviors, aggressiveness, and social, attentional and thought problems. They also showed higher results for the internalizing and externalizing categories, others and total. In the CDI, DD students had higher averages for total score and for the following symptoms: negative self-evaluation, guilt, suicidal thoughts, feeling concern, performance comparison, sleeping difficulties, fatigue, and problems in interacting with peers at school.

Conclusions: We discuss the results in terms of implications for DD diagnosis and intervention. Parent reports indicate a higher frequency of behavior problems in students with DD diagnosis. Those students also demonstrate more symptoms of depression than students without learning difficulties.

Key words: learning disorders, dyslexia, depression, signs and symptoms

Citation: de Lima, R. F., Salgado-Azoni, C. A., Dell'Agli, B. A. V., Baptista, M. N., Ciasca, S. M. (2020). Behavior Problems and Depressive Symptoms in Developmental Dyslexia: Risk Assessment in Brazilian Students. *Clinical Neuropsychiatry*, 17 (3), 141-148.

doi.org/10.36131/cnforitieditore20200301

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Funding: Ricardo Franco de Lima from National council for scientific and technological development.

Competing interests: All authors declare no financial conflict of interest of any kind with respect to the contents of this manuscript.

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Introduction

Developmental Dyslexia (DD) is a specific learning disability characterized by difficulties in reading comprehension and word writing, without overall intelligence and sensory deficits, and preserving the ability of effective learning within the classroom (APA, 2014; British Dyslexia Association, 2011; Lyon, Shaywitz, & Shaywitz, 2003; WHO, 2008). Reading difficulties have been explained by multifactorial causal models, emphasizing phonological deficits (Catts, McIlraith, Bridges, & Nielsen, 2017; Lyon, Shaywitz, & Shaywitz, 2003).

Previous studies have argued that these individuals are at a greater risk for developing psychological symptoms (Maag & Reid, 2009; Mugnaini, Lassi, La Malfa, & Albertini, 2009; Sahoo, Biswas, &

Padhy, 2015) and psychiatric comorbidities (Bäcker & Neuhäuser 2003; Hendren, Haft, Black, White, & Hoelt, 2018; Sahoo, Biswas, & Padhy, 2015; Willcutt & Pennington, 2000) because they have a tendency for low self-concept and self-esteem, a high external locus of control, lower social acceptance, problematic psychosocial functioning, and display more anxiety than their peers without learning difficulties (Parhiala et al., 2015; Sahoo, Biswas, & Padhy, 2015; Terras, Thompson, & Minnis, 2009).

Meta-analysis studies mainly associate DD to internalizing disorders (Maag & Reid, 2009; Mugnaini, Lassi, La Malfa, & Albertini, 2009; Snowling, Muter, & Carroll, 2007), characterized by withdrawal, anxiety and depression (Heath & Ross, 2000; Maag & Reid, 2009; Mugnaini, Lassi, La Malfa, & Albertini, 2009). More specifically, studies using tracing devices show

that individuals with dyslexia report depressive symptoms more often than proficient readers (Arnold et al., 2005; Heath, 1995; Maag & Reid, 2009; Stevenson & Rommey, 1984; Wright-Strawderman & Watson, 1992). Among the frequently described symptoms are suicidal thoughts, negative self-concept, anhedonia, fatigue, problems in social relationships and comparison of performance with peers (Lima & Ciasca, 2010a; Wright-Strawderman & Watson, 1992). Nelson and Liebel (2017) showed that individuals with dyslexia report more depressive symptoms, even after controlling for the effects of socially desirable responding. On the other hand, some studies (Burden, 2008; Miller, Hynd, & Miller, 2005) have questioned whether the diagnosis of dyslexia can be considered an increased risk for psychological symptoms and the development of comorbidities.

The symptoms collected from parents' opinions tend to be broader and point to attention problems and aggressiveness (Arnold et al., 2005; Knivsberg & Andreassen, 2008; Lima & Ciasca, 2010). Heiervang et al. (2000) compared behavior problems in a sample of 25 children with dyslexia and a matched control group. In this study, researchers used instruments with children (Youth Self Report, YSR), parents (Child Behavior Checklist, CBCL), and teachers (Teacher Self Report, TRF). The results indicated that dyslexic group had higher scores (CBCL and TRF) on the Total Behavior Problem Scale, the Internalizing and Externalizing subdomains, and the Attention Problem subscale.

Identifying the consequences of dyslexia in other developmental domains is crucial during diagnosis and helps therapeutic planning (Maag & Reid, 2006; Mugnaini, Lassi, La Malfa, & Albertini, 2009). Nonetheless, the literature has focused on characterizing the cognitive profile of individuals who have dyslexia (Cruz-Rodrigues et al., 2014; Zoubrinetzky, Bielle, F., & Valdois, 2014), and little is known about the emotional and behavioral consequences of this disorder (Bäcker & Neuhäuser, 2003; Maag & Reid, 2006; Mugnaini, Lassi, La Malfa, & Albertini, 2009; Sahoo, Biswas, & Padhy, 2015; Willcutt & Pennington, 2000). Therefore, the aim of this study was to compare the behavior problems and depressive symptoms between students with DD and students without learning difficulties.

Method

Ethical aspects

This study was approved by the ethics committee of the Faculty of Medical Sciences of the State University of Campinas (protocol no. 648/2007) and all parents signed informed consent forms, conformed to the Declaration of Helsinki for research involving human subjects.

Participants

Participants were 61 students from both sexes (62% boys), aged from 7 to 14 years (average 9.72 years, $SD=1.57$), from middle income households, attending 2nd to 8th grades in public schools in the metropolitan region of a city in the State of São Paulo, Brazil. This region is formed by twenty cities, being diverse in terms of ethnicity. The students were divided in two groups: with developmental dyslexia, and control. Both groups were subjected to the Wechsler Intelligence Scale for Children, 3rd edition - WISC-III (Rueda et al., 2013), in order to include only participants with a normal

intelligence level (Intelligence Quotient, $IQ \geq 80$).

Developmental Dyslexia Group (DG): This group was formed by 31 students (71% boys) recruited, by an interdisciplinary team, from an initial pool of 125 students (74% boys) that were referred to a pediatric neurology outpatient clinic with reading/writing complaints. The sample size was compatible with other studies that have similar objectives (Heiervang, Stevenson, Lund, & Hugdahl, 2001; Lima & Ciasca, 2010a; Snowling, Muter, V., & Carroll, 2007). The following selection criteria were used for DG participants: (a) fulfillment of DD diagnostic criteria; (b) impaired performance in phonological processing (access to mental lexicon, phonological awareness and working phonological memory) and reading (accuracy and/or speed) using standard measures (Phonological Awareness Test, Rapid Automatized Naming, evaluation of the level and speed of oral reading, Test of Reading and Writing) (Salgado & Capellini, 2008); (c) normal intelligence level ($IQ \geq 80$); (d) no sensory alterations (visual, auditory); (f) no use of psychotropic drugs. The diagnostic criteria for DD included performance with 2 standard deviations below the age group in reading speed, reading accuracy, writing under dictation, writing spontaneously, rapid automatized naming test, phonological awareness test, and phonological working memory test; in addition to Diagnostic and Statistical Manual of Mental Disorders, DSM-5 (APA, 2014) and International Classification of Diseases, ICD-10 (WHO, 2008) criteria. The participants did not have psychiatric comorbidities.

Control Group (CG): This group included 30 students (53% boys), proficient in reading, and without attention or learning complaints. The criteria used for selection were: (a) designation by their teacher as students without learning difficulties and with an adequate school performance; (b) normal intelligence level ($IQ \geq 80$) and no alterations in components of phonological processing, as a result of neuropsychological and language evaluations; (c) no sensory alterations (visual, auditory); (d) no use of psychotropic drugs. Sample characteristics are described in **table 1**.

Instruments

Behavior Problems

We used the Child Behavior Checklist - CBCL (Achenbach & Rescorla, 2004; Bordin et al., 2013), a questionnaire directed to parents which evaluates the emotional and behavior characteristics in 6- to 18-year-olds. The CBCL includes a first part, which concerns social aspects, and a second part, containing 113 statements, which was used in this work. Each statement is scored in a three-point Likert scale: (a, score 0) the statement is false or the behavior is absent; (b, score 1) the statement is partially true or the behavior is sometimes present; (c, score 2) the statement is very true or the behavior is frequently present. For scoring, all items are grouped in nine specific scales: I. Anxious/Depressed; II. Withdrawn/Depressed; III. Somatic Complaints; IV. Social Problems; V. Thought Problems; VI. Attention Problems; VII. Rule-Breaking Behavior; VIII. Aggressive Behavior; and IX. Other Problems. Afterwards, the scores of each scale are added, according to the item's scores. This study considered the raw scores of each scale (sum of each item's score), the additional "Internalizing Behavior" scores (sum of scales I + II + III), the "Externalizing Behavior" scores (VII + VIII), "Others" (IV + V + VI) and "Total score" (sum of all scores). A higher score meant a higher level

of symptoms according to parents. CBCL has been used in clinical studies and international versions have a test-retest reliability of 0.90, internal consistency of 0.72 (Cronbach's alpha), and criterion validity with discriminative capacity of clinical and non-clinical groups (Achenbach & Rescorla, 2001). In our study, the Cronbach's alpha coefficient was 0.93.

Depressive symptoms

The 20-item version of the Children's Depression Inventory – CDI (Coutinho, Carolino, & Medeiros, 2008) was used. The CDI is a self-reporting scale for tracing depressive symptoms in 7- to 17-year-old children and youth. The participant should select one out of three alternatives for answering each item. The score of each item may be: (i) 0 (absence of symptom), (ii) 1 (presence of symptom) or; (iii) 2 (serious symptom). The total score was obtained by summing up all items, varying between 0 and 40. A cut-off of 17 points was used for significant symptomatology. The additional raw scores were also obtained from the sum of the items to which they refer: (a) Affective aspects (1. sadness, 6. fear/negative assessment of the future, 7. negative self-concept, 10. desire to cry, 13. negative self-image, 16. loneliness 19. feeling unloved); (b) Cognitive aspects (2. pessimism, 3. negative self-evaluation of performance and abilities, 8. guilt, 9. suicidal thoughts, 11. feeling concern and 18. comparison of performance with peers); (c) Behavior aspects (4. leisure, 5. hostile behavior, 12. withdrawal, 17. interaction with peers in school and 20. disobedience); (d) Somatic aspects (14. sleeping difficulties and 15. fatigue). Concerning psychometric properties of the CDI, Brazilian studies show internal consistency ranging between 0.73 and

0.91 (Gomes et al., 2013). In the present study, the Cronbach's alpha coefficient was 0.70.

Procedures and statistical analysis

A single professional administered the instruments (RFL, clinical neuropsychologist). CBCL was performed with the parents, ensuring that they understood adequately the items. Students that were part of the groups were individually evaluated using the CDI. Given the reading difficulties of the DG, the CDI administration was monitored. Each sentence was read, and the student was guided to indicate which best described his/her feelings, thoughts and behaviors in the past weeks. The researcher explained the terms used in the instrument and answered any concerns to ensure everyone understood the questions. The same procedure was applied to the CG.

Statistical analysis of the data was performed in SPSS version 20.0. To compare the groups, a non-parametric Mann-Whitney test was used for numerical variables and a Chi-square or Fisher's exact test was used for categorical variables, considering a significance level of $p \leq 0.05$. In addition, a measure of effect size was included (Cohen's d) to compare differences between the averages of the groups. The effect size was interpreted as: low ($d < 0.20$), average ($0.21 > d < 0.79$), and high average ($d > 0.80$) (Conboy, 2003). Spearman's correlation was carried between CDI total score and CBCL scales.

Results

As shown in **table 1**, both groups had similar sex

Table 1. Sample characterization

Variables	DG	CG	Total	p-value
<i>Sex</i>	<i>f (%)</i>	<i>f (%)</i>	<i>f (%)</i>	
Male	22 (71)	16 (53)	38 (62)	.155 ^a
Female	09 (29)	14 (47)	23 (38)	.182 ^c
<i>Grade</i>				
2 nd -4 th	11 (36)	15 (50)	26 (43)	.252 ^a
5 th -8 th	20 (65)	15 (50)	35 (57)	.147 ^c
<i>Age</i>				
7-9	10 (32)	19 (63)	29 (48)	.015^a
10-14	21 (68)	11 (37)	32 (52)	.311^c
Min-Max	8-14	7-11	7-14	
M ± SD	10.5 ± 1.65	9.0 ± 1.07	9.72 ± 1.57	<.001^b
<i>IQ's</i>	<i>M ± SD</i>	<i>M ± SD</i>	<i>M ± SD</i>	
Verbal (VIQ)	102.65 ± 15.52 <i>Average</i>	118.20 ± 11.74 <i>High Average</i>	110.30 ± 15.76 <i>High Average</i>	<.001^b
Performance (PIQ)	103.61 ± 11.35 <i>Average</i>	114.10 ± 13.29 <i>High Average</i>	108.77 ± 13.33 <i>Average</i>	.001^b
Full (FIQ)	103.39 ± 13.21 <i>Average</i>	117.63 ± 12.00 <i>High Average</i>	110.39 ± 14.44 <i>High Average</i>	<.001^b

Notes: ^aChi-square test; ^bMann-Whitney test; ^cCramer's V.

Abbreviations: *f* = frequency; Min = Minimum; Max = Maximum; M ± SD = Mean ± Standard Deviation.

and school year distributions. Average age was also different between groups ($U = 224.50, p < 0.001$). The IQ for the whole sample ranged from 108 to 110, equal or better than average. CG had higher VIQ ($U = 213.00, p < 0.001$), PIQ ($U = 231.00, p < 0.01$) and FIQ scores ($U = 194.00, p < 0.001$) than DG. IQ classification (VIQ, PIQ and FIQ) (Rueda et al., 2013) was in line with the average for DG and was a high average for CG.

Table 2 shows that the groups had significantly different CBCL scores, with Cohen's d between average and high average. In the somatic complaints scale, Cohen's d was low, with no significant difference between DG and CG, but, when symptoms were considered together, DG and CG were different in all scales, with a high average effect size.

No child exceeded the CDI cut-off point in the whole sample. **Table 3** shows differences between the groups in total CDI score and in the cognitive and somatic symptom categories, with a high average effect size. For the categories of affective and behavior symptoms we observed a low effect size.

Table 4 compares the descriptive statistics for each CDI item between the groups. We observed significant differences between groups in items 3, 8, 9, 11, 14, 15, 17 and 18, corresponding to Cohen's d between average and high average, but detected no significant differences for items 5, 7, 10 and 13, corresponding to a low effect size. Significant correlations were obtained

between the CDI total and the following CBCL scores: Attention Problems ($r = .537; p < 0.001$), Aggressive Behavior ($r = .357; p < 0.01$), Externalizing Behavior ($r = .321; p < .01$), Others ($r = .395; p < .01$) and Total ($r = .365; p < .01$).

In order to ascertain the characteristics of the answers that had significant results for CDI items, we calculated the frequency distribution (**table 5**), and obtained significant differences between groups for items 3, 9, 11, 15, 17 and 18. Item 8 had a marginally significant difference.

Discussion

This study compared behavioral problems and the presence of depressive symptoms in two groups, one with a DD diagnosis and another without learning difficulties. According to results of the CBCL, parents of DD individuals more often reported social, attention and thinking problems, anxiety, depression, withdrawal, rule breaking, aggressiveness and other problems. Additionally, DG scores for instrument categories were also higher for problems in internalizing, externalizing, general and total behaviors.

Previous studies emphasized that children with dyslexia are more vulnerable to developing internalizing disorders, such as affective or anxiety disorders (Heiervang, Stevenson, Lund, & Hugdahl,

Table 2. Comparison of the groups' CBCL scales

CBCL Scales	DG	CG	U	p-value ^a	Cohen's d
	M ± SD				
I- Anxious/Depressed	8.26 ± 5.43	4.77 ± 3.33	298.00	.016	.77
II- Withdrawn/Depressed	3.77 ± 3.27	1.40 ± 1.85	238.00	.001	.89
III- Somatic Complaints	3.65 ± 3.65	2.30 ± 2.25	372.00	.174	.45
IV- Social Problems	6.58 ± 4.46	2.23 ± 1.96	186.50	<.001	1.26
V- Thought Problems	4.61 ± 4.04	1.77 ± 2.34	223.00	<.001	.86
VI- Attention Problems	10.26 ± 4.26	3.13 ± 3.37	89.00	<.001	1.86
VII- Rule-Breaking Behavior	3.74 ± 3.68	1.57 ± 2.01	276.00	.006	.73
VIII- Aggressive Behavior	10.84 ± 7.30	6.43 ± 5.67	294.50	.014	.67
IX- Others	6.00 ± 3.21	3.53 ± 3.04	264.50	.004	.79
Internalizing Behavior	15.32 ± 10.55	8.47 ± 6.45	277.00	.007	.78
Externalizing Behavior	14.58 ± 10.52	8.00 ± 7.38	286.00	.010	.72
Others	27.45 ± 13.43	10.67 ± 9.50	120.50	<.001	1.44
Total Score	57.35 ± 32.08	27.13 ± 21.65	179.50	<.001	1.10

Notes: ^aMann-Whitney test.

Abbreviations: M ± SD = Mean ± Standard Deviation.

Table 3. Comparison of the groups' CDI scores

CDI scores	DG	CG	U	p-value ^a	Cohen's d
	M ± SD				
CDI-Total	6.48 ± 3.60	3.33 ± 1.95	201.00	<.001	1.09
Affective	1.52 ± 1.15	1.23 ± 0.97	399.00	.318	.27
Cognitive	2.71 ± 1.77	1.03 ± 0.89	183.00	<.001	1.20
Behavior	1.26 ± 0.96	.87 ± 0.90	356.00	.096	.42
Somatic	1.00 ± 1.06	.20 ± 0.48	267.00	.001	0.97

Notes: ^aMann-Whitney test.

Abbreviations: M ± SD = Mean ± Standard Deviation.

Table 4. Comparison of the groups' CDI items

CDI items	DG	CG	U	p-value ^a	Cohen's d
	M ± SD				
1. Frequent sadness	.06 ± .25	.03 ± .18	450.50	.577	.14
2. Hopelessness	.71 ± .59	.53 ± .51	397.00	.260	.33
3. Can't do anything right/incompetent	.29 ± .53	.00	345.00	.003	.77
4. Anhedonia	.55 ± .51	.47 ± .51	427.00	.527	.16
5. See self as "bad"	.00	.03 ± .18	449.50	.309	-.24
6. Worries that bad things are going to happen to self	.58 ± .56	.63 ± .49	435.00	.615	-.10
7. Self-hatred	.16 ± .37	.07 ± .25	421.00	.250	.29
8. Guilt	.32 ± .54	.07 ± .25	360.00	.023	.59
9. Suicidal thoughts	.16 ± .37	.00	390.00	.023	.61
10. Frequent crying	.00	.03 ± .18	449.50	.309	-.24
11. Bothered by things	.45 ± .68	.10 ± .31	342.00	.015	.66
12. Doesn't want to be with people	.03 ± .18	.07 ± .25	449.00	.538	-.18
13. Feels ugly	.45 ± .57	.20 ± .41	360.00	.060	.50
14. Sleeping difficulties	.58 ± .76	.20 ± .48	341.50	.026	.60
15. Fatigue	.42 ± .67	.00	315.00	.001	.89
16. Loneliness	.19 ± .48	.17 ± .38	465.00	1.000	.05
17. Doesn't have fun at school	.42 ± .50	.10 ± .31	316.50	.005	.77
18. Feels inferior to other kids	.77 ± .56	.33 ± .48	280.00	.002	.84
19. Feels unloved	.06 ± .25	.10 ± .31	448.50	.616	-.14
20. Noncompliant	.26 ± .44	.20 ± .41	438.00	.593	.14

Notes: ^aMann-Whitney test.

Abbreviations: M ± SD = Mean ± standard deviation.

Table 5. Frequency distribution for CDI items that showed differences between groups

CDI items	DG	CG	Total	p-value ^a
	f (%)			
I do most things O.K.	23(74)	30(100)	53(87)	
3 I do many things wrong	07(23)	0	07(11)	.007
I do everything wrong	01(03)	0	01(02)	
Bad things are not usually my fault	22(71)	28(93)	50(82)	
8 Many bad things are my fault	08(26)	02(07)	10(16)	.060
All bad things are my fault	01(03)	0	01(02)	
I do not think about killing myself	26(84)	30(100)	56(92)	
9 I think about killing myself but would not do it	05(16)	0	5(8)	.053
I want to kill myself	0	0	0	
Things bother me once in a while	20(65)	27(90)	47(77)	
11 Things bother me many times	08(26)	03(10)	11(18)	.046
Things bother me all the time	03(10)	0(0)	03(05)	
I sleep pretty well	18(58)	25(83)	43(70)	
14 I have trouble sleeping many nights	08(26)	04(13)	12(20)	.079
I have trouble sleeping every night	05(16)	01(03)	06(10)	
I am tired once in a while	21(68)	30(100)	51(84)	
15 I am tired many days	07(23)	0	07(11)	.001
I am tired all the time	03(10)	0	03(05)	
I have fun at school many times	18(58)	27(90)	45(74)	
17 I have fun at school only once in a while	13(42)	03(10)	16(26)	.008
I never have fun at school	0	0	0	
I am just as good as other kids	09(29)	20(67)	29(48)	
18 I can be as good as other kids if I want to	20(65)	10(33)	30(49)	.007
I can never be as good as other kids	02(06)	0	02(03)	

Abbreviation: f = frequency.

Notes: ^aFisher's exact test.

2001; Sahoo, Biswas, & Padhy, 2015; Willcutt & Pennington, 2000). However, when assessed with parent testimonies and a screening test, no specific pattern can be discerned to the emotional and behavior problems that accompany DD (Terras, Thompson, & Minnis, 2009; Willcutt & Pennington, 2000). It is possible that the DD diagnosis itself, and its characteristics, increase the parents' awareness of the difficulties their children might experience in other aspects of development. Furthermore, although CBCL is accurate for some diagnoses (Lampert, Polanczyk, Tramontina, Mardini, & Rohde, 2004), it has a bias toward general complaints, requiring complementation with other instruments. Finally, the pattern of emotional and behavioral problems may associate with factors such as subtype of learning disorder (Nelson & Gregg, 2012, Yu, Buka, McCormick, Fitzmaurice, & Indurkha, 2006), sex (Terras, Thompson, & Minnis, 2009; Willcutt & Pennington, 2000) or the age when the diagnosis was made (Willcutt & Pennington, 2000).

Although no participant had comorbidity with Attention Deficit Hyperactivity Disorder (ADHD), parents reported more attention problems in dyslexic group. Similar results were found by Heiervang, Stevenson, Lund, & Hugdahl, (2001). Furthermore, these findings are compatible with previous studies that show the attention and executive functions problems as part of the neuropsychological profile in dyslexia (Lima, Salgado-Azoni, & Ciasca, 2013; Moura, Simões, & Pereira, 2015).

This study also evaluated depressive symptoms. Results showed that DD individuals had higher scores in total CDI, cognitive and somatic scores. However, the mean total CDI score was below the cut-off point of the instrument (<17 points), suggesting subclinical levels of depression. Other studies also reported depressive symptoms in samples of students with DD or other learning disorders, albeit at higher average scores (Fristad, Topolosky, Weller, & Weller, 1992; Lima & Ciasca, 2010a; Maughan, Rowe, Loeber, & Stouthamer-Loeber, 2003; Sahoo et al., 2015; Willcutt & Pennington, 2000; Zoubrinetzky et al., 2014).

Comparing the groups for each CDI item, the symptoms most frequently reported by DD students were: negative self-evaluation of performance, guilt, suicidal thoughts, feeling concern, comparing their performance with peers (cognitive symptoms), sleeping difficulties, fatigue (somatic symptoms), and problems in interacting with peers at school (behavior symptoms). However, there were no significant reports of depressive mood, one of the key criteria for diagnosis of mood disorder according to diagnostics manuals (APA, 2014; WHO, 2008). Thus, although individuals of the sample with dyslexia reported more symptoms, those were not sufficient for a diagnosis of depressive disorder.

Even though this study not establish a causal relationship, part of the reported symptoms could result from the individuals own learning difficulties, as proposed by Sideridis' goal orientation model of depression vulnerability (Sideridis, 2007). Thus, difficulties experienced in the school context may lead to repeated experiences of failure, negative self-evaluation of performance, development of negative feelings, feeling concern, problems in interpersonal relationships, among others. Studies that report impairments in self-efficacy, self-concept and self-esteem for children and adolescents with DD have described these types of consequences (Bäcker & Neuhäuser, 2003; Heath & Ross, 2000; Stevenson & Rommey, 1984; Wright-Strawderman & Watson, 1992).

Analysis of the CDI items with significant

differences between groups allowed us to identify the most frequent answers. An item that stands out is suicidal thoughts. All CG participants answered "*I do not think about killing myself*", while 16% of DG participants chose the answer "*I think about killing myself but would not do it*". The same answer had a 10% frequency in other studies with students without learning difficulties (Poch, Ballabriga, & Llaberia, 2000; Viñas, Canals, Gras, Ros, & Domènech-Llaberia, 2002), suggesting that learning disability may represent a vulnerability factor for more serious consequences.

There was a positive correlation between the total CDI and the parents report about attention problems, aggressive behavior, externalizing behaviors, others and total. Interestingly, there was no agreement between students and parents reports about depressive symptoms and internalizing problems, respectively. The results obtained from parents and students could represent isolated events of low severity. However, studies show that they tend to persist throughout development and to predispose the individual to psychiatric comorbidities, especially when the protective factors are inefficient (Wilson, Deri Armstrong, Furrie, & Walcot, 2009; Sideridis, 2007). As for consequences in adulthood, one study showed that individuals carrying learning disabilities report two times higher levels of depression, anxiety, suicidal thoughts and visits to mental health professionals (Wilson et al., 2009).

Regarding the sample characteristics, DG students were, on average, one year five months older than CG students. The higher average age in the DG was expected, as, according to the diagnosis criteria, DD individuals tend to delay the development of reading and writing abilities up to two years (APA, 2014; WHO, 2008). In addition, DD is usually diagnosed after the literacy process has been completed (Ciasca, Rodrigues, Salgado-Azoni, & Lima, 2015). Another relevant result concerns intellectual performance: both groups displayed total IQ scores within expected average for their age group, according to the instrument norm (Rueda, Noronha, Sisto, Santos, & Castro, 2014) and diagnostic criteria for DD (APA, 2014; WHO, 2008). Nevertheless, comparison between groups showed that CG had higher average scores than DG for total, verbal and execution IQ. Although the intellectual performance of individuals who have dyslexia is within normal standards, the data suggests that their scores can be inferior when compared with normolexic children. Other studies have described similar results and may explain the heterogeneity of deficits found in individuals with DD (De Clercq-Quaegebeur, Casalis, Lemaitre, Bourgois, Getto, & Vallée, 2010; Mugnaini et al., 2009). Furthermore, evidence suggests that the presence of depressive symptoms may negatively impact neuropsychological performance, worsening the damage to these individuals during their school life (Lima & Ciasca, 2010b).

An important implication of this study is that the investigation of behavior problems in DD is fundamental to determine which professional will be part of the treatment as well as what are the conditions of response to the interventions. Some authors argue that the emotional suffering experienced by the individuals who have dyslexia is related with the degree of severity of the disorder, complexity of symptoms (and association with difficulties in other areas, such as mathematics), school exclusion situations, comorbidity with other disorders, inappropriate parent and teacher handling of difficulties, little capacity to resolve problems, among others (Mugnaini et al., 2009; Willcutt & Pennington, 2000). It is important to underline that late DD diagnosis

associated with low protective factors (such as social and family support and coping strategies) may increase the risk of psychiatric comorbidities and the impact in the individual's development (Alexander-Passe, 2006; Willcutt & Pennington, 2000; Wilson et al., 2009). Thus, interventions targeting only the cognitive and linguistic aspects may not be as effective and should be complemented with psychological and psychiatric monitoring. According Hendren, Haft, Black, White, & Hoefft, (2018), an interdisciplinary approach to learning disorders, integrating health professionals and educators, can lead to treatments encompassing both academic and mental health interventions. This approach can be more effective and contribute to improved educational and health-related outcomes to dyslexic individuals.

The current study had some limitations. First, the instruments used allowed screening only of general symptoms in the parents and depressive symptoms in the students; future studies should enhance this analysis by investigating the main psychiatric comorbidities of DD. Second, the procedures provided no distinction of symptoms by sex, age group or age during the diagnosis. A larger sample of DD students would likely allow this type of analysis to be made with higher accuracy. Finally, a longitudinal study would allow understanding the development trajectory in individuals with this learning disability.

In summary, this study found that parents of DD students report problems, both for internalizing and for externalizing behaviors, more often than parents of normolexic students. Compared to students without learning difficulties, children with dyslexia also had more reports of depressive symptoms. These results underscore the need to include evaluation of affective and behavioral aspects in the diagnostic process of learning disabilities. Moreover, psychotherapeutic interventions may be able to minimize the psychological consequences suffered by them, favoring acquisition of coping strategies.

Acknowledgements

The first author received funding from National Council for Scientific and Technological Development (CNPq).

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