PRE-SERVICE TEACHERS' KNOWLEDGE ABOUT DYSLEXIA

CONHECIMENTO DE PROFESSORES EM FORMAÇÃO SOBRE A DISLEXIA

CONOCIMIENTO DE DOCENTES EM FORMACIÓN SOBRE LA DISLEXIA

Marcela Fulanete CORRÊA[1]
e-mail: marcela.correa@univasf.edu.br

Jéssica Moreira FONSECA[2]
e-mail: jehmoreirafonseca@gmail.com

Maria Cecília Assis ARAÚJO[3]
e-mail: maria.ceciliaassis@discente.univasf.edu.br

How to reference this paper:

Corrêa, M. F., Fonseca, J M., & Araújo, M. C. (2026). Pre-service teachers' knowledge about dyslexia. *Doxa: Rev. Bras. Psico. e Educ.*, *27*, e026004. e-ISSN: 2594-8385. https://doi.org/10.30715/doxa.v27i00.21091

| **Submitted**: 13/04/2026
| **Revisions required**: 22/05/2026
| **Approved**: 03/06/206
| **Published**: 25/06/2026

Editor: Prof. Dr. Paulo Rennes Marçal Ribeiro
Deputy Executive Editor: Prof. Dr. José Anderson Santos Cruz

[1] Federal University of the São Francisco Valley (UNIVASF), Petrolina – Pernambuco (PE) – Brazil. Ph.D. in Psychology from the Federal University of Minas Gerais (UFMG) and Professor in the Psychology Program at the Federal University of the São Francisco Valley (UNIVASF). She currently coordinates the Literacy Studies Laboratory (LEA) and conducts research in the fields of cognitive development and language.

[2] Federal University of the São Francisco Valley (UNIVASF), Petrolina – Pernambuco (PE) – Brazil. Bachelor's degree in Psychology from UNIVASF. Her research interests include Cognitive Psychology and School and Educational Psychology, with an emphasis on literacy, learning difficulties, and neurodevelopmental disorders.

[3] Federal University of the São Francisco Valley (UNIVASF), Petrolina – Pernambuco (PE) – Brazil. Undergraduate student in Psychology at the Federal University of the São Francisco Valley (UNIVASF). Her research interests include Cognitive Psychology, learning, language, and cognitive development.

ABSTRACT: This study assessed pre-service teachers' knowledge about dyslexia and examined whether undergraduate training in dyslexia is associated with such knowledge. The sample included 276 undergraduate students in Pedagogy from public higher education institutions in Brazil. All participants completed a sociodemographic questionnaire and a translated version of the Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS). According to the results, the participants demonstrated accurate knowledge about nature, causes, outcomes, and symptomatology of dyslexia. However, misconceptions, e.g. the belief that dyslexia results from visual deficits, and a lack of knowledge about evidence-based interventions were also found. Undergraduate training in dyslexia was significantly associated with knowledge about the disorder. These findings highlight gaps in the initial training of future teachers and suggest that Pedagogy curricula should incorporate evidence-based content on dyslexia.

KEYWORDS: Dyslexia. Teacher training. Teacher knowledge. Learning difficulties. Higher education.

RESUMO: *Este estudo avaliou o conhecimento dos professores em formação sobre a dislexia e verificou se a formação recebida sobre o transtorno durante a graduação associa-se com o conhecimento sobre a condição. A amostra incluiu 276 estudantes de Pedagogia de instituições públicas de ensino superior no Brasil. Todos responderam um questionário sociodemográfico e uma versão traduzida do Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS). Segundo os resultados, os participantes apresentaram conhecimentos precisos sobre a natureza, causas, desfechos e a sintomatologia da dislexia. Contudo, concepções equivocadas, como a crença de que a dislexia é resultado de déficits visuais, e desconhecimento sobre intervenções baseadas em evidências também foram identificadas. A formação em dislexia recebida durante o curso de Pedagogia associou-se significativamente ao conhecimento sobre o transtorno. Esses achados evidenciam lacunas na formação inicial dos futuros professores e sugerem que os currículos dos cursos de Pedagogia incorporem conteúdos científicos sobre a dislexia.*

PALAVRAS-CHAVE: *Dislexia. Formação de professores. Conhecimento docente. Dificuldades de aprendizagem. Educação superior.*

RESUMEN: *Este estudio evaluó el conocimiento de los docentes en formación sobre la dislexia y examinó si la formación recibida sobre el trastorno durante la educación superior se asocia con el conocimiento sobre la condición. La muestra incluyó a 276 estudiantes de Pedagogía de instituciones públicas en Brasil. Todos respondieron un cuestionario sociodemográfico y una versión traducida de la Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS). Según los resultados, los participantes presentaron conocimientos sobre la naturaleza, las causas, los desenlaces y la sintomatología de la dislexia. Sin embargo, también se identificaron concepciones erróneas, como la creencia de que la dislexia resulta de déficits visuales, así como desconocimiento sobre intervenciones basadas en la evidencia. La formación en dislexia se asoció positivamente con el conocimiento sobre el trastorno. Estos hallazgos evidencian lagunas en la formación inicial docente y sugieren que los programas de Pedagogía incorporen contenidos científicos sobre la dislexia.*

PALABRAS CLAVE: *Dislexia. Formación docente. Conocimiento docente. Dificultades de aprendizaje. Educación superior*

INTRODUCTION

Dyslexia is a specific learning disorder of neurobiological origin, characterized by difficulties with accurate and fluent word reading and/or spelling. These difficulties are not explained by a lack of educational opportunities, poor quality of instruction, or lack of motivation, nor can they be attributed to intellectual disability or sensory or neurological impairments (International Dyslexia Association, 2025). According to a predominant theoretical model in the literature, dyslexia results from a deficit in the phonological processing of language, especially in phonemic awareness. This deficit prevents the formation of high-quality phonological representations, resulting in impairments in reading and writing learning (Parrila et al., 2020).

Epidemiological studies indicate that dyslexia is the most prevalent learning disorder, affecting between 5% and 17.5% of the world's population (Yang et al., 2022; Wagner et al., 2020). In Brazil, it is estimated that about 10 million people are dyslexic (American Psychiatric Association, 2023). The hereditary nature of dyslexia is widely documented in the scientific literature, with evidence indicating that between 40% and 70% of children with parents diagnosed with dyslexia also manifest the disorder. Among siblings, about 40% share the condition (Erbeli et al., 2022; Gialluisi et al., 2021).

It is important to note that dyslexia does not represent a delay in learning to read and write that can be overcome. On the contrary, it is a chronic and persistent condition, and there is a real urgency to both provide early identification and ensure that dyslexics receive the necessary support as soon as they are diagnosed (Gaab & Petscher, 2022). Indeed, the absence or delay in diagnosis and intervention increases the risk that individuals with dyslexia will develop problems such as school dropout, low self-esteem, anxiety, depression, conduct disorders, and lower occupational attainment (McArthur et al., 2020; Sanfilippo et al., 2020).

The signs and symptoms of dyslexia manifest from the early years of the literacy process, with the teacher generally being the first professional to notice the students' difficulties in acquiring reading and writing skills. The results of some studies suggest that teachers' knowledge about dyslexia plays an important role in identifying the symptoms associated with this disorder and in the early referral of students for specialized assessment in health services (Joshi & Wijekumar, 2020; Morrison & Hessler, 2016). Evidence further indicates that teachers who are better informed about dyslexia tend to adopt evidence-based pedagogical practices that ensure the learning of reading and writing by students diagnosed with the disorder (Gonzalez, 2021; Lyon & Weiser, 2009).

Over the last few decades, several international studies have investigated the knowledge of pre-service and in-service teachers regarding dyslexia. Conducted in countries such as China (Yin et al., 2020), the United Kingdom (Knight, 2018), New Zealand (Dymock & Nicholson, 2023), Norway (Solheim et al., 2024), Spain and Peru (Soriano-Ferrer et al., 2016), South Africa (Geertsema et al., 2022), Saudi Arabia (Abed & Shackelford, 2022), Turkey (Dodur & Kumaş, 2020), the United States (Gonzalez, 2021; Gonzalez, 2026; Peltier et al., 2022), and Kazakhstan (Galimzhanova, 2025), these investigations revealed that, despite teachers recognizing reading and writing difficulties as typical manifestations of dyslexia and understanding its neurobiological basis, misconceptions about the disorder prevail. Among the most recurring misconceptions are the denial of the hereditary nature of dyslexia; the belief that the disorder can be cured or overcome with time; the mistaken attribution of the nature of dyslexia to visual or intellectual deficits; and the incorrect idea that the disorder is characterized by seeing letters backwards or "reversed." Equally common are the misconceptions that diagnosis must be performed by ophthalmologists and that the use of colored lenses, medication, or the practice of eye-tracking exercises constitute effective forms of treatment for dyslexia (Bollig et al., 2026). These studies have also shown that teachers who received training on dyslexia, whether through courses, training, or content covered during their academic education, tend to demonstrate more accurate knowledge about the disorder (Peltier et al., 2022; Nadelson et al., 2019).

In Brazil, scientific literature on teachers' knowledge about dyslexia is scarce. Studies conducted with basic education teachers from municipalities in the interior of São Paulo and from the municipality of Abreu e Lima in Pernambuco revealed that these professionals had difficulties in defining the disorder, in identifying its manifestations, and in attributing its causes (Giroto & Castro, 2011; Gonçalves & Crenitte, 2014; Medeiros, 2015; Tabaquim et al., 2016; Nascimento et al., 2018). Many teachers mistakenly associated dyslexia with symptoms such as mood variability, inattention, hyperactivity, and/or lack of motivation. In the study by Tabaquim et al. (2016), for example, although most teachers recognize that dyslexia is a condition characterized by deficits in phonological processing, 73.2% erroneously attributed the cause of the disorder to emotional problems.

It should be noted that the Brazilian studies that investigated teachers' knowledge about dyslexia were conducted before the approval of Law No. 14.254, of November 30, 2021 (Brazil, 2021). This law, which addresses the comprehensive support of students with dyslexia, Attention Deficit Hyperactivity Disorder (ADHD), and other learning disorders, establishes that

both schools and teachers are responsible for the educational support of students with dyslexia. The law further provides that education systems must ensure solid training for basic education teachers, enabling them to identify the signs of dyslexia early and to provide educational support to students with persistent difficulties in learning to read and write. Given this new scenario, it becomes important to investigate teachers' knowledge of dyslexia and to evaluate whether legal changes are being accompanied by progress in these professionals' training regarding the disorder. Another aspect that stands out in the studies conducted in Brazil concerns the fact that they all investigated practicing teachers' knowledge about dyslexia. In the country, no study has investigated the knowledge of teachers in training regarding dyslexia, leaving open questions concerning the preparation of future educators to deal with dyslexic students.

In light of the above, the present study had the following objectives: (1) to investigate pre-service teachers' knowledge about dyslexia, and (2) to evaluate whether the training on dyslexia received during the undergraduate Pedagogy program is associated with the future teachers' knowledge of the disorder.

METHODOLOGY

This is a survey study with a correlational design and a quantitative approach. Survey studies are suitable for investigating the characteristics or knowledge of specific groups through systematic data collection (Gil, 2022), while correlational design allows for examining associations between variables (Cozby & Bates, 2020). In this study, a quantitative approach was used to measure knowledge about dyslexia and investigate the factors associated with this knowledge through statistical analyses.

PARTICIPANTS

The study included 276 teachers in training regularly enrolled in undergraduate Pedagogy courses at public higher education institutions in Brazil. The participants were between 18 and 72 years old, with a mean age of 31.3 years and a standard deviation of 11.7. Only those who answered all items of the instruments used in this study were included in the sample.

Of the total number of participants, the majority were female (88%), were between 18 and 25 years old (46.4%), and self-identified as white (46.4%). Regarding educational level and

the semester of the course in which they were enrolled, 73.9% of the participants did not have any undergraduate degree, and 36.7% were in the first or second semester of the Pedagogy course.

When asked if they had taken any course during their undergraduate studies in Pedagogy in which dyslexia was addressed, 21% of the participants answered affirmatively, while the majority (79%) stated they had not taken any courses that covered this topic. Table 1 presents the sociodemographic characteristics of the participants included in the study.

Table 1.
Sociodemographic characteristics of the participants

Variable	Category	Frequency	Percentage
Sex	Female	243	88.0
	Male	30	10.9
	I prefer not to disclose	3	1.1
Age	18-25 years old	128	46.4
	26-39 years old	74	26.8
	40-59 years old	70	25.4
	60 years or older	4	1.4
Breed	White	128	46.4
	Brown	104	37.7
	Black	37	13.4
	Indigenous	1	0.3
	Yellow	6	2.2
Education level	Incomplete undergraduate degree	204	73.9
	Completed undergraduate degree	42	15.3
	Specialization	22	8.0
	Master's Degree	4	1.4
	Doctorate	4	1.4
Course duration	1st and 2nd periods	101	36.7
	3rd and 4th periods	71	25.7
	5th and 6th periods	33	11.9
	7th and 8th periods	71	25.7
Took a course on dyslexia during undergraduate studies in Pedagogy	Yes	58	21.0
	No	218	79.0

Note. Authors.

INSTRUMENTS

The data were collected through a self-administered questionnaire, created in *Google Forms*, consisting of two sections and a total of 42 items. The first section included the sociodemographic questionnaire, while the second contained the dyslexia knowledge questionnaire.

Sociodemographic questionnaire: consisting of six closed-ended questions, this questionnaire aimed to collect information about age, sex, race, level of education, the semester in which the participants were enrolled, and whether they had taken subjects that addressed dyslexia during their undergraduate degree in Pedagogy.

Dyslexia knowledge questionnaire: this instrument was translated by the authors of the present study based on the *Knowledge and Beliefs about Developmental Dyslexia Scale* (KBDDS). The KBDDS was developed by Soriano-Ferrer et al. (2016) to assess knowledge and misconceptions about dyslexia. The questionnaire consists of 36 items distributed into three dimensions, namely: general information (17 items), diagnosis (10 items), and intervention (9 items). The general information dimension assesses knowledge regarding the etiology, prevalence, manifestations, and outcomes of dyslexia. The diagnostic dimension includes items related to symptoms, cognitive deficits underlying the disorder, and aspects pertinent to its identification. The intervention dimension, in turn, investigates beliefs related to pedagogical practices, educational adaptations, and the effectiveness of treatments and resources associated with dyslexia. Each item consists of a statement about dyslexia, and the response options for each item are “true”, “false”, and “I don’t know”. This response format, in addition to allowing for the distinction between what participants were unaware of regarding dyslexia and what they mistakenly believed about the disorder, also reduces the risk of random responses.

The order of presentation of the items was randomized. The participants’ responses were scored according to the criteria of Soriano-Ferrer et al. (2016), with correct responses receiving 1 point and incorrect or “I don’t know” responses receiving 0 points. The maximum score each participant could achieve on the questionnaire was 36 points, with 17 points for the general information dimension, 10 points for the diagnosis dimension, and 9 points for the intervention dimension. In this study, the internal consistency of the KBDDS was estimated by the alpha coefficient of *Cronbach*, a measure that assesses the extent to which the items of an instrument converge for the measurement of the same construct. The coefficients obtained were 0.80 for the general information dimension, 0.75 for the diagnosis dimension, 0.71 for the intervention

dimension, and 0.90 for the total score, indicating satisfactory internal consistency for all KBDDS domains.

Procedures

The coordinators of the undergraduate programs in Pedagogy were contacted by email and informed about the objectives of the study. The coordinators were also encouraged to share the access link to the questionnaires with the students enrolled in the course. Data collection took place online. Before accessing the questionnaires, participants were asked to read the Informed Consent Form (ICF). Only those who consented to participate had access to the questionnaires. The participants initially completed the sociodemographic questionnaire, followed by the dyslexia knowledge questionnaire.

DATA ANALYSIS

The data analysis used descriptive and inferential statistics. Descriptive statistics were employed to characterize the sample and examine the participants' knowledge about dyslexia. Before the inferential analyses, the normality of the score distributions in the three dimensions of the KBDDS and in the total score was verified using skewness and kurtosis values. The observed values fell within the range of -1 to +1, meeting the assumption of normality for the distribution of the variables (George & Mallery, 2019).

An analysis of variance (ANOVA) for repeated measures was performed to compare the participants' performance across the different dimensions of the KBDDS. When statistically significant differences were identified, *post-hoc* tests with *Bonferroni* correction were used to examine between which KBDDS dimensions these differences occurred.

To examine whether the training on dyslexia received by future teachers during their undergraduate studies was associated with their knowledge about the disorder, regardless of sociodemographic differences, a hierarchical regression was conducted. The total score on the KBDDS was used as the dependent variable. In the first model, the variables age, education, and course period were included. In the second model, the dyslexia training variable was added. The assumptions of absence of multicollinearity among the independent variables, linearity, homoscedasticity, and normality of the residuals were verified in the regression analysis. Multicollinearity was evaluated using tolerance values and the variance inflation factor, while the other assumptions were examined via graphical inspection of standardized residuals against

fitted values and histograms of the residuals. All analyses were conducted in the Jamovi software (version 2.6), a free and open-source program developed for performing statistical analyses.

Ethical aspects

The study was approved by the Research Ethics Committee of the University Hospital of the Federal University of the São Francisco Valley under CAAE 75994523.3.0000.0282. All participants were informed about the study objectives, and only those who consented to participate by accepting the Informed Consent Form (ICF) were included in the sample. Participation was voluntary, with a guarantee of confidentiality and the possibility of withdrawal at any time, without any negative consequences for the participants.

RESULTS

Table 2 presents the minimum and maximum scores, the mean, the standard deviation, and the mean percentage of correct responses in the general information, diagnosis, and intervention dimensions and in the total KBDDS score. As can be observed, the participants demonstrated moderate performance in all dimensions and in the total score, with average percentages of correct answers ranging between 46.9% and 53.9%. The results of the repeated measures ANOVA indicated a significant difference in the percentage of correct responses in the KBDDS dimensions ($F(2, 275) = 18.8$, $p < 0.001$, $\eta^2_p = 0.06$). Post-hoc tests with *Bonferroni* correction revealed that participants' performance was significantly higher in the general information and diagnosis dimensions compared to the intervention dimension ($ps < 0.001$). On the other hand, no significant difference was found between the general information and diagnosis dimensions (p = 0.06).

Table 2
Descriptive statistics of the KBDDS

Variable	Min-Max	Mean (SD)	Average percentage of correct answers
General information	0-17	8,74 (3,12)	51,4%
Diagnosis	0-10	5,39 (2,25)	53,9%
Intervention	0-9	4,22 (1,88)	46,9%
Total score	0-36	18,4 (6,19)	51,0%

Note. Min-Max: minimum and maximum observed scores; SD = standard deviation.

Table 3 presents the percentage of correct, incorrect, and "don't know" responses for each item and dimension of the KBDDS. In the general information dimension, more than 90% of teachers in training recognized that dyslexia is not a myth (item 25) and that not every child with reading difficulties is dyslexic (item 16). The majority understood that students with dyslexia may have low self-esteem (69.6%, item 31) and that the disorder is not associated with intellectual deficits or laziness (69.5%, item 21). More than 60% of the participants were also aware that dyslexia is a neurological disorder (67.4%, item 1), that many people with the disorder continue to face reading difficulties in adulthood (67.0%, item 30), that children with dyslexia can be gifted (65.6%, item 3), and that the disorder persists for a long time (60.5%, item 35).

In the diagnostic dimension, 83.3% of teachers in training recognized that children with dyslexia tend to make writing errors (item 34) and 79.4% correctly rejected the idea that people with the disorder have below-average intelligence (item 11). The participants understood that the reading of students with dyslexia is characterized by inaccuracy and a lack of fluency (58.7%, item 12), that the disorder is associated with difficulties in phonemic awareness (58.3%, item 9), in phonological processing (55.8%, item 14), in decoding and writing, but without impairment to auditory comprehension (58.0%, item 32). More than half of the teachers in training also knew that dyslexia is characterized by difficulties in fluent reading (54.7%, item 36) and that the diagnosis of the disorder requires the application of individual and formal reading tests (54.3%, item 33).

In the intervention dimension, the majority of participants demonstrated adequate knowledge by considering it appropriate to offer curricular accommodations, such as additional time on tests and simplification of word lists for students with dyslexia (85.5%, item 22). Furthermore, 59.4% of teachers in training knew that intervention programs that emphasize the phonological aspects of language are effective for students with dyslexia (item 23). It is worth noting that 86.2% of the participants acknowledged that teachers do not receive intensive training to work with dyslexic children (item 24).

In contrast, three items showed a higher proportion of incorrect answers, highlighting misconceptions about dyslexia among future teachers. In the general information dimension, 63% of the participants erroneously believed that the disorder is caused by deficits in visual perception, resulting in the inversion of letters and words (item 2). In item 20, 59.4% considered that children with reading difficulties without an apparent cause do not have dyslexia. In the

diagnostic dimension, 50.5% stated that seeing letters and words backwards is a characteristic of dyslexia (item 13).

For other items, participants demonstrated more uncertainty than adherence to misconceptions about dyslexia. In the general information dimension, more than half of the participants stated they did not know the prevalence of the disorder (59.1%, item 7). The participants were also unaware that dyslexia occurs more in men than in women (59.8%, item 8) and that laterality problems are not the cause of this condition (59.1%, item 27). Similarly, in the intervention dimension, 59.1% did not know that the use of colored lenses does not benefit children with dyslexia (item 17), 54.7% were unaware of the effectiveness of the multisensory method in treating the disorder (item 19), and 51.5% reported not knowing that students with dyslexia benefit from explicit and systematic reading instruction (item 28).

A result that deserves to be highlighted concerns the participants' performance on item 29 of the general information dimension and on items 10 and 26 of the intervention dimension. These items address, respectively, the chronic nature of the disorder, the effectiveness of reading aloud and collectively for students with dyslexia, and the importance of repeated reading of the same text to improve reading fluency. In these items, Pedagogy students presented an equivalent proportion of correct answers and "I don't know" responses, denoting a poorly consolidated understanding of these aspects of dyslexia. It is also worth noting the participants' performance on item 6 of the general information dimension. In this item, only 28.2% of the participants recognized the hereditary nature of dyslexia, while the others either denied it (33%) or stated they were unaware of the genetic component of the disorder (38.8%).

Table 3.
Percentage of responses to KBDDS items

General information	Correct answer	True	False	I don't know
1) Dyslexia is the result of a neurological disorder.	V	67.4	8.0	24.6
2) Dyslexia is caused by deficits in visual perception, resulting in the inversion of letters and words.	F	63.0	19.2	17.8
3) A child can be dyslexic and gifted.	V	65.6	8.0	26.4
4) Children with dyslexia often experience social and emotional difficulties.	V	59.8	14.5	25.7
5) The brain of individuals with dyslexia is different from the brain of individuals without dyslexia.	V	34.4	30.8	34.8
6) Dyslexia is hereditary.	V	28.2	33.0	38.8
7) Most studies indicate that about 5% of school-age students have dyslexia.	V	37.3	3.6	59.1
8) Dyslexia occurs more frequently in men than in women.	V	24.6	15.6	59.8

16) All children with reading difficulties have dyslexia.	F	1.8	90.8	7.2
20) Children who have reading difficulties with no apparent cause (for example, intellectual disabilities, absenteeism, inadequate instruction, etc.) have dyslexia.	V	9.8	59.4	30.8
21) Children with dyslexia are not less intelligent or lazy.	V	69.5	21.4	9.1
25) Dyslexia is a myth, that is, it does not exist.	F	0.7	97.5	1.8
27) Laterality problems are the cause of dyslexia.	F	9.8	31.2	59.1
29) Dyslexia refers to a chronic condition that is often not completely overcome.	V	41.3	19.1	39.5
30) Many children with dyslexia continue to have reading problems in adulthood.	V	67.0	6.6	26.4
31) Many students with dyslexia have low self-esteem.	V	69.6	5.4	25.0
35) Dyslexia generally persists for a long time.	V	60.5	4.3	35.2
Diagnosis	**Correct answer**	**True**	**False**	**I don't know**
9) Children with dyslexia show marked difficulties in phonemic awareness, that is, in the ability to detect and manipulate speech sounds.	V	58.3	12.7	29.0
11) People with dyslexia have below-average intelligence.	F	4.7	79.4	15.9
12) The reading of students with dyslexia is often characterized by inaccuracy and a lack of fluency.	V	58.7	12.3	29.0
13) Seeing letters and words backwards is a characteristic of dyslexia.	F	50.5	14.9	34.8
14) Difficulties in phonological processing of language are associated with dyslexia.	V	55.8	8.7	35.5
15) Intelligence tests are useful in the identification of dyslexia.	V	21.7	38.4	39.9
32) Children with dyslexia have difficulties with decoding and writing, but not with auditory comprehension.	V	58.0	12.7	29.3
33) The administration of an individual and formal reading test is essential for the diagnosis of dyslexia.	V	54.3	6.2	39.5
34) Children with dyslexia tend to make mistakes when writing words.	V	83.3	2.2	14.5
36) Dyslexia is characterized by difficulty reading fluently.	V	54.7	18.5	26.8
Intervention	**Correct answer**	**True**	**False**	**I don't know**
10) Reading aloud and collectively is an effective strategy for children with dyslexia.	V	40.6	20.3	39.1
17) The use of colored lenses benefits children with dyslexia.	F	6.9	34.2	59.1
18) Doctors can prescribe medication to help students with dyslexia.	F	30.8	22.1	47.1
19) The multisensory method is not an effective teaching strategy for children with dyslexia.	F	10.9	34.4	54.7
22) Providing curricular adjustments for students with dyslexia, such as additional time on tests, shorter word lists, etc., is fair.	V	85.5	3.6	10.9
23) Intervention programs that emphasize the phonological aspects of language are considered effective for students with dyslexia.	V	59.4	1.1	39.5
24) Most teachers receive intensive training to work with children with dyslexia.	F	1.1	86.2	12.7

26) Reading the same text repeatedly is an effective teaching strategy to improve reading fluency.	V	39.1	25.0	35.9
28) Students with dyslexia benefit from explicit and systematic reading instruction.	V	21.0	27.5	51.5

Note. Authors.

The hierarchical regression analysis revealed that the first model, composed of the variables age, education, and course period, did not explain a significant proportion of the variations in the total KBDDS score (R^2 = 0.01, F(3,272) = 0.99, p = 0.39). However, the inclusion of the dyslexia training variable resulted in a statistically significant model (R^2 = 0.04, F(4,271) = 2.65, p In the final model, only training in dyslexia was significantly associated with knowledge about the disorder (β = 0.41, CI[0.72 – 4.37], p < 0.01), suggesting that participants who took courses on dyslexia during their undergraduate studies had higher scores on the KBDDS, regardless of age, education level, and the semester of the course in which they were enrolled.

DISCUSSION

The present study aimed to investigate the knowledge of undergraduate Pedagogy students regarding dyslexia and to examine whether the training received on the disorder during their course is associated with their knowledge of the condition. According to the results, 20 of the 36 KBDDS items were answered correctly by more than half of the participants, suggesting that, despite future teachers demonstrating accurate knowledge about dyslexia, this knowledge coexisted with misconceptions and a lack of knowledge about the disorder.

In general, Pedagogy students showed greater knowledge about the nature, causes, outcomes, and symptomatology of dyslexia. The teachers in training understood that dyslexia is a specific learning disorder of neurobiological origin, characterized by difficulties in reading and writing words. The participants also knew that the disorder is not associated with intellectual disability, impairments in auditory comprehension, or a lack of effort, and that not all students with reading difficulties are dyslexic. Future teachers also demonstrated an understanding that dyslexia can compromise students' emotional health and that these students need pedagogical adaptations. These results are consistent with those found in previous studies conducted with teachers in training (Washburn et al., 2014; Soriano-Ferrer et al., 2016; Echegaray-Bengoa et al., 2017) and indicate that part of the knowledge about dyslexia of future Brazilian teachers is aligned with the current scientific consensus.

Pedagogy students also presented a higher proportion of correct answers on items that assessed knowledge about the phonological difficulties of individuals with dyslexia. However, it is worth noting that more than 40% of the participants did not know or considered false the statement that children with dyslexia have significant difficulties with phonemic awareness and that intervention programs that emphasize the phonological aspects of language are effective in teaching reading and writing to dyslexic students. The deficit in phonological processing, which manifests as difficulty in performing phonemic awareness tasks, is recognized in the literature as the main underlying mechanism of dyslexia (Parrila et al., 2020). Robust evidence also indicates that systematic phonics instruction, which emphasizes the correspondences between letters and speech sounds, is the most effective way to teach literacy to children with and without dyslexia (Ehri et al., 2001; Hall et al., 2023). The lack of knowledge among Pedagogy students regarding these aspects is concerning and, as suggested by Bollig et al. (2026), may compromise the ability of future teachers to recognize signs of risk and provide appropriate pedagogical support to students with dyslexia.

Teachers in training also demonstrated a poorly consolidated understanding of the persistent nature of dyslexia. Indeed, despite the majority having recognized that dyslexia persists for a long time and that children with dyslexia continue to face reading difficulties in adulthood, only 41.3% identified dyslexia as a chronic condition, not completely overcome This weakness in the knowledge of future teachers may lead to the mistaken expectation that the disorder will resolve spontaneously over time or with the advancement of schooling, favoring the early abandonment of pedagogical support. According to Gaab and Petscher (2022), continuous pedagogical support is fundamental to reducing the academic and emotional impacts of dyslexia.

A misconception frequently found in the literature refers to teachers' belief that dyslexia results from deficits in the visual system and that the disorder is characterized by seeing letters backward (Gonzalez, 2026; Bollig et al., 2026). The results of the present study suggest that this conception is also present among Brazilian teachers in training. The persistence of these misconceptions may be related to the initial description of dyslexia as "congenital word blindness" (Green, 2022). Although this description has been superseded and it is now recognized that the central deficit of dyslexia lies in the language system, this myth still persists among Pedagogy undergraduates in Brazil, highlighting limitations in initial teacher training and reinforcing the need for undergraduate curricula to include content based on scientific

evidence regarding the cognitive foundations of learning to read and write and their associated difficulties.

Another misconception demonstrated by more than half of the participants refers to the notion that dyslexia is a reading learning disorder with an apparent cause. In other words, teachers in training believed that reading difficulty in dyslexia can be explained by factors such as sensory or intellectual deficits, absenteeism, or poor quality of teaching. This misconception is reinforced by the fact that 78.3% of participants disagreed or did not know that intelligence tests are useful in the differential diagnosis of dyslexia, especially regarding the exclusion of other conditions that could explain poor reading and writing performance. This result contrasts with previous studies that pointed to greater teacher knowledge about the unexpected nature of dyslexia (Peltier et al., 2022; Solheim et al., 2024; Gonzalez, 2026). This distorted knowledge may lead future teachers to resort to inappropriate alternative explanations for the poor reading performance of students with dyslexia, perpetuating stigmas and delaying both the referral for diagnosis in specialized health services and the implementation of early interventions.

In addition to the endorsed misconceptions, the teachers in training also demonstrated higher levels of uncertainty on items in the general information and intervention dimension of the KBDDS. In the general information dimension, prospective teachers were unaware of the prevalence of dyslexia, its gender distribution, and its hereditary etiology. The participants were also unaware that laterality difficulties are not a cause of dyslexia. In the intervention dimension, uncertainty predominated regarding the ineffectiveness of colored lenses and medication to treat dyslexia, as well as regarding the effectiveness of the multisensory method and explicit and systematic reading instruction. These knowledge gaps hinder the identification of factors associated with dyslexia, delaying diagnosis and the guarantee of access to timely pedagogical accommodations. Furthermore, the lack of knowledge about evidence-based practices may favor the adoption of ineffective pedagogical strategies, reducing opportunities for academic progress for students with dyslexia (Gemio et al., 2023).

In the present study, the training received on dyslexia during the undergraduate course in Pedagogy was a significant predictor of knowledge about the disorder. This result converges with previous findings (Peltier et al., 2022; Nadelson et al., 2019) and reinforces the importance of including content on dyslexia in the curriculum of Pedagogy courses. As suggested by Solheim et al. (2024), training on dyslexia should be understood as an essential component of Pedagogy curricula, and not as complementary or accessory content. However, it is important to highlight that dyslexia training, as measured in this study, explained a small proportion of

the variation in knowledge about the disorder, suggesting that other unassessed factors—for example, the number and course load of subjects, practical experiences, individual interest, or prior contact with people with dyslexia—may also contribute to more accurate knowledge about the condition.

Despite the contributions of this study to the understanding of pre-service teachers' knowledge about dyslexia, some limitations must be considered in the interpretation of the results. Firstly, the study included a non-probability sample composed only of Pedagogy students from public higher education institutions in Brazil, restricting the generalization of the findings to the national scenario. Secondly, the instrument used to measure knowledge about dyslexia was only translated, but not adapted. Despite the high reliability indices of the KBDDS found in this study, the lack of psychometric validation of the instrument may have affected the precision and validity of the measures obtained. Thirdly, data collection was conducted remotely, making it impossible to control response conditions, such as consulting external sources. Finally, this study did not collect information about the participants' previous experiences with people with dyslexia, whether in internship, research, or extension activities, or previous professional experiences. Given that some evidence suggests that contact with people with dyslexia is positively associated with teachers' knowledge about the disorder (Worthy et al., 2016; Mullikin et al., 2021; Gonzalez, 2026), the absence of this variable in the present study may have obscured relevant factors associated with the participants' performance on the KBDDS. All these limitations highlight aspects that need to be improved in future studies.

FINAL CONSIDERATIONS

This study revealed that, despite initial training in Pedagogy providing knowledge about important aspects of dyslexia, it still does not equip future teachers to recognize risk signs, make referrals for diagnosis, or implement evidence-based pedagogical interventions. The persistence of visual myths, the misunderstanding of the chronic and hereditary nature of the disorder, and the lack of knowledge about effective intervention practices indicate that the initial training of educators is, to a certain extent, limited. These limitations become even more critical in light of Law No. 14,254/2021, which assigns to basic education teachers the responsibility of monitoring and offering pedagogical support directed at the difficulties of students with dyslexia.

Law No. 14,254/2021 further establishes that education systems must ensure continuing education on learning disorders for basic education teachers, enabling them for the early identification and implementation of appropriate educational support for students with dyslexia. This legal prerogative is supported by the results of the present study, which demonstrated that the training received by Pedagogy students regarding dyslexia during their undergraduate studies played an important role in their knowledge of the disorder. This finding reinforces the need for Pedagogy training to include the study of dyslexia aligned with the best available scientific evidence, ensuring that future teachers are better prepared to recognize the risk signs of the disorder early and respond appropriately to the difficulties presented by students.

REFERENCES

Abed, M. G., & Shackelford, T. K. (2022). Saudi public primary school teachers' knowledge and beliefs about developmental dyslexia. *Dyslexia, 28*(2), 244–251. https://doi.org/10.1002/dys.1705

American Psychiatric Association. (2023). *Manual diagnóstico e estatístico de transtornos mentais: DSM-5-TR* (M. I. C. Nascimento et al., Trads.; 5ª ed., texto rev.). Artmed.

Brasil. (2021). *Lei nº 14.254, de 30 de novembro de 2021. Dispõe sobre o acompanhamento integral para educandos com dislexia ou transtorno do déficit de atenção com hiperatividade (TDAH) ou outro transtorno de aprendizagem*. https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/L14254.htm

Bollig, B., Coverdale, G., Bayliss, D., MacArthur, G., & Badcock, N. A. (2026). What parents, teachers, and clinicians know about the features of developmental dyslexia and its intervention: A scoping review. *Dyslexia, 32*(1), e70017. https://doi.org/10.1002/dys.70017

Cozby, P. C., & Bates, S. C. (2020). *Methods in behavioral research* (14th ed.). McGraw-Hill Education.

Dodur, H. M. S., & Kumaş, Ö. A. (2020). Knowledge and beliefs of classroom teachers about dyslexia: The case of teachers in Turkey. *European Journal of Special Needs Education, 35*(4), 489–502. https://doi.org/10.1080/08856257.2019.1666121

Dymock, S., & Nicholson, T. (2023). Dyslexia seen through the eyes of teachers: An exploratory survey. *Reading Research Quarterly, 58*(2), 333–344. https://doi.org/10.1002/rrq.490

Echegaray-Bengoa, J. A., Soriano-Ferrer, M., & Joshi, R. M. (2017). Knowledge and beliefs about developmental dyslexia: A comparison between pre-service and in-service Peruvian teachers. *Journal of Learning Disabilities, 50*(4), 498–510. https://doi.org/10.1177/1538192717697591

Ehri, L. C., Nunes, S. R., Stahl, S. A., & Willows, D. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's meta-analysis. *Review of Educational Research, 71*(3), 393–447. https://doi.org/10.3102/00346543071003393

Erbeli, F., Rice, M., & Paracchini, S. (2022). Insights into dyslexia genetics research from the last two decades. *Brain Sciences, 12*(1), Article 27. https://doi.org/10.3390/brainsci12010027

Gaab, N., & Petscher, Y. (2022). *Screening for early literacy milestones and reading disabilities: The why, when, whom, how, and where*. Harvard Graduate School of Education.

Galimzhanova, G. (2025). Teachers' knowledge of dyslexia in one of the largest regions of Kazakhstan. *Journal of Research in Special Educational Needs, 25*(3), 555–568. https://doi.org/10.1111/1471-3802.12745

Geertsema, S., Le Roux, M., Bhorat, A., Carrim, A., Valley, M., & Graham, M. (2022). Developmental dyslexia in private schools in South Africa: Educators' perspectives. *South African Journal of Education, 42*(4), 1–12. https://doi.org/10.15700/saje.v42n4a1992

Gemio, A. B., Navas, A. L., Azoni, C. A. S., Borges, J. P. A., & Ciboto, T. (Eds.). (2023). *Dislexia e a lei: Os direitos garantidos pela Lei nº 14.254/21* [E-book]. Instituto ABCD. https://www.institutoabcd.org.br/wp-content/uploads/2019/04/ebook-lei.pdf

George, D., & Mallery, P. (2019). *IBM SPSS statistics 25 step by step: A simple guide and reference* (15th ed.). Routledge.

Gialluisi, A., Andlauer, T. F. M., Mirza-Schreiber, N., Moll, K., Becker, J., Hoffmann, P., Ludwig, K. U., Czamara, D., St Pourcain, B., Honbolygó, F., Tóth, D., Csépe, V., Huguet, G., Chaix, Y., Iannuzzi, S., Demonet, J.-F., Morris, A. P., Hulslander, J., Willcutt, E. G., ... Schulte-Körne, G. (2021). Genome-wide association study reveals new insights into the heritability and genetic correlates of developmental dyslexia. *Molecular Psychiatry, 26*(7), 3004–3017. https://doi.org/10.1038/s41380-020-00898-x

Gil, A. C. (2022). *Métodos e técnicas de pesquisa social* (7ª ed.). Atlas.

Giroto, C. R. M., & Castro, R. M. de. (2011). A formação de professores para a educação inclusiva: Alguns aspectos de um trabalho colaborativo entre pesquisadores e professores da educação infantil. *Revista Educação Especial, 24*(41), 441–451.

Gonçalves, T. S., & Crenitte, P. A. P. (2014). Conceptions of elementary school teachers about learning disorders. *Revista CEFAC, 16*(3), 817–829.

Gonzalez, M. (2021). Dyslexia knowledge, perceived preparedness, and professional development needs of in-service educators. *Annals of Dyslexia, 71*(3), 547–567. https://doi.org/10.1007/s11881-021-00235-z

Gonzalez, M. (2026). The impact of dyslexia legislation: An analysis of knowledge and preparedness among in-service educators. *Journal of Educational and Learning, 15*(1), 12–31. https://doi.org/10.5539/jel.v15n1p12

Green, E. A. (2022). Continuing the debate: A response to the Literacy Research Association's dyslexia research report. *International Journal of Education and Literacy Studies, 10*(3), 72–79. https://doi.org/10.7575/aiac.ijels.v.10n.3p.72

Hall, C., Dahl-Leonard, K., Cho, E., Solari, E. J., Capin, P., Conner, C. L., Henry, A. R., Cook, L., Hayes, L., Vargas, I., Richmond, C. L., & Kehoe, K. F. (2023). Forty years of reading intervention research for elementary students with or at risk for dyslexia: A systematic review and meta-analysis. *Reading Research Quarterly, 58*(2), 285–312. https://doi.org/10.1002/rrq.477

International Dyslexia Association. (2025). *Definition of dyslexia*. https://dyslexiaida.org/definition-of-dyslexia/

Joshi, R. M., & Wijekumar, K. (2020). Introduction to the special issue: Teacher knowledge of literacy skills: International perspectives. *Dyslexia, 26*(3), 245–246. https://doi.org/10.1002/dys.1665

Knight, C. (2018). What is dyslexia? An exploration of the relationship between teachers' understandings of dyslexia and their training experiences. *Dyslexia, 24*(3), 207–219. https://doi.org/10.1002/dys.1593

Lyon, G. R., & Weiser, B. (2009). Teacher knowledge, instructional expertise, and the development of reading proficiency. *Reading and Writing, 22*(4), 475–493. https://doi.org/10.1007/s11145-009-9166-1

Medeiros, M. C. G. (2015). *O que os professores conhecem sobre dislexia e o transtorno de déficit de atenção/hiperatividade* (Coleção Prata da Casa). SESI-SP Editora.

McArthur, G. M., Filardi, N., Francis, D. A., Boyes, M. E., & Badcock, N. A. (2020). Self-concept in poor readers: A systematic review and meta-analysis. *PeerJ, 8*, e8772. https://doi.org/10.7717/peerj.8772

Morrison, D., & Hessler, T. (2016). Teaching the teachers: Eliminating gaps to better serve children with dyslexia. *Perspectives on Language and Literacy, 42*(4), 7–11.

Mullikin, K., Stransky, M., Tendulkar, S., Casey, M., & Kosinski, K. (2021). Informal preparation and years of experience: Key correlates of dyslexia knowledge among Massachusetts early elementary teachers. *Dyslexia, 27*(4), 510–524. https://doi.org/10.1002/dys.1701

Nadelson, L. S., Beavers, A., Eppes, B., Rogers, A., Sergeant, K., Turner, S., & Van Winkle, A. (2019). A comparison of teachers' perceptions, misconceptions, and teaching students with dyslexia. *World Journal of Educational Research, 6*(4), 442–462. https://doi.org/10.22158/wjer.v6n4p442

Nascimento, I. S. do, Rosal, A. G. C., & Queiroga, B. A. M. de. (2018). Elementary school teachers' knowledge on dyslexia. *Revista CEFAC, 20*(1), 87–94. https://doi.org/10.1590/1982-021620182019117

Parrila, R., Dudley, D., Song, S., & Georgiou, G. K. (2020). A meta-analysis of reading-level match dyslexia studies in consistent alphabetic orthographies. *Annals of Dyslexia, 70*(1), 1–26. https://doi.org/10.1007/s11881-019-00187-5

Peltier, T., Washburn, E. K., Heddy, B. C., & Binks-Cantrell, E. (2022). What do teachers know about dyslexia? It's complicated. *Reading and Writing, 35*(9), 2077–2107. https://doi.org/10.1007/s11145-022-10264-8

Sanfilippo, J., Ness, M., Petscher, Y., Rappaport, L., Zuckerman, B., & Gaab, N. (2020). Reintroducing dyslexia: Early identification and implications for pediatric practice. *Pediatrics, 146*(1), e20193046. https://doi.org/10.1542/peds.2019-3046

Solheim, O. J., Arntzen, J., & Foldnes, N. (2024). Norwegian classroom teachers' and specialized "resource" teachers' dyslexia knowledge. *Reading and Writing, 37*(10), 2619–2641. https://doi.org/10.1007/s11145-023-10486-4

Soriano-Ferrer, M., Echegaray-Bengoa, J., & Joshi, R. M. (2016). Knowledge and beliefs about developmental dyslexia in preservice and in-service Spanish-speaking teachers. *Annals of Dyslexia, 66*(1), 91–110. https://doi.org/10.1007/s11881-015-0111-1

Tabaquim, M. de L. M., Dauruiz, S., Prudenciatti, S. M., & Niquerito, A. V. (2016). The conception of primary education teachers about developmental dyslexia. *Revista Brasileira de Estudos Pedagógicos, 97*(245), 131–146. https://doi.org/10.1590/S2176-6681/368214020

Wagner, R. K., Zirps, F. A., Edwards, A. A., Wood, S. G., Joyner, R. E., Becker, B. J., Liu, G., & Beal, B. (2020). The prevalence of dyslexia: A new approach to its estimation. *Journal of Learning Disabilities, 53*(5), 354–365. https://doi.org/10.1177/0022219420920377

Washburn, E. K., Mulcahy, C. A., Joshi, R. M., & Binks-Cantrell, E. (2016). Teacher knowledge of dyslexia. *Perspectives on Language and Literacy, 42*(4), 9–13.

Worthy, J., DeJulio, S., Svrcek, N., Villarreal, D. A., Derbyshire, C., LeeKeenan, K., Wiebe, M. T., Lammert, C., Rubin, J. C., & Salmerón, C. (2016). Teachers' understandings, perspectives, and experiences of dyslexia. *Literacy Research: Theory, Method, and Practice, 65*(1), 436–453. https://doi.org/10.1177/2381336916661529

Yang, L., Li, C., Li, X., Zhai, M., An, Q., Zhang, Y., Zhao, J., & Weng, X. (2022). Prevalence of developmental dyslexia in primary school children: A systematic review and meta-analysis. *Brain Sciences, 12*(2), Article 240. https://doi.org/10.3390/brainsci12020240

Yin, L., Joshi, R. M., & Yan, H. (2020). Knowledge about dyslexia among early literacy teachers in China. *Dyslexia, 26*(3), 247–265. https://doi.org/10.1002/dys.1635

CRediT Author Statement

- **Acknowledgements**: To the Federal University of the São Francisco Valley (UNIVASF) and to the Pedagogy students who participated in the study.
- **Funding**: The study was financially supported by the Federal University of the São Francisco Valley (UNIVASF), through a scientific initiation scholarship granted to the second author within the scope of the Institutional Program of Scientific Initiation Scholarships (PIBIC).
- **Conflicts of interest**: The authors declare that they have no conflicts of interest.
- **Ethical approval**: The study was approved by the Research Ethics Committee (CEP) of the University Hospital of the Federal University of the São Francisco Valley (HU-UNIVASF) under CAAE 75994523.3.0000.0282.
- **Data and material availability**: The data and materials used in this study are stored with the researchers.
- **Author contributions**: The first author contributed to the conceptualization and methodological design of the study, data management and analysis, study administration, drafting of the original manuscript, revision and editing of the manuscript, and securing funding. The second and third authors contributed to data collection and curation, revision and editing of the manuscript.

Processing and editing: Editora Ibero-Americana de Educação
Proofreading, formatting, standardization and Translation