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Qualitative analysis of the prevalence of learning disabilities in the context of secondary schools in 2023–2025

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Abstract: This study examines the prevalence and diagnostics of developmental learning disorders (DLD) among secondary school students in Slovakia between 2023 and 2025. Developmental learning disorders, such as dyslexia, dysgraphia, and dyscalculia, represent a growing educational concern due to their long-term impact on students' academic success and psychological well-being. A qualitative and statistical analysis was conducted using data collected from multiple secondary schools across Slovakia. The study focused on identifying diagnostic trends, gender differences, and institutional disparities, comparing grammar and vocational schools to determine the distribution and accessibility of diagnostic services. Findings revealed an increasing trend in diagnosed cases of DLD, particularly dyslexia, dysgraphia, and dyscalculia. A notable gender disparity was observed, with boys being diagnosed significantly more often than girls. Cross-school comparisons indicated a higher concentration of diagnosed cases in grammar schools compared to vocational schools. The results highlight the importance of early diagnostics, individualized support strategies, and inclusive educational practices to promote academic and psychological well-being for students with DLD. The study also emphasizes the urgent need for teacher training and improved diagnostic accessibility, particularly within vocational schools.

Keywords: *Diagnosis, Gender differences, Dyslexia, Educational support, High school students, Inclusive education, Specific learning disorders.*

1. Introduction

Developmental learning disorders represent a complex phenomenon that significantly affects the educational process of secondary school students. These disorders, especially dyslexia, dysgraphia, dysorthographia, and dyscalculia, are considered permanent, and their manifestations often deepen or transform depending on age and school demands (Vališová & Kasíková, 2011). Specific learning disorders are not caused by a lack of intelligence, social disadvantage, or inadequate teaching, but are due to the atypical development of certain functions of the central nervous system (Kaplánová, 2019). The Council for Exceptional Children (2017) defines developmental learning disabilities as neurologically based disorders that affect the ability to read, write, compute, or organize information. In Slovakia, developmental learning disorders are also governed by the legislative framework according to the Decree of the Ministry of Education of the Slovak Republic No. 325/2008 Coll., which regulates the conditions of education of pupils with special educational needs.

1.1. Prevalence and Diagnostics of Developmental Learning Disorders in Secondary School Students

Developmental learning disabilities (DLD), such as dyslexia, dysgraphia, dysorthographia, or dyscalculia, are specific disorders that affect the ability to process information and learn, despite average or above-average intellectual potential (Švancara, 2011). Although developmental learning disabilities are most commonly diagnosed in the first years of primary school, their manifestations often persist into

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later school years and affect the academic performance, self-esteem, and school life of secondary school students (Kondáš & Šturma, 2018). It is estimated that developmental learning disabilities affect approximately 5-15% of children, and this prevalence can vary depending on research methodology and diagnostic criteria (American Psychiatric Association, 2013). However, these disorders are often underdiagnosed in secondary school students, especially in students with average compensatory strategies or those who have adopted different coping strategies to manage learning problems (Horňák, 2015). Research suggests that among secondary school students, as many as 7-10% of students may have some form of DLD (Vágnerová, 2012). Diagnosing DLD in high school students requires a multidisciplinary approach that includes special educators, psychologists, and teachers. Standardized tests focusing on reading, writing, grammar, and mathematical skills are used to identify disorders, supplemented by interviews, observation, and analysis of school performance (Lukášová, 2016). A childhood history and previous school assessments are also important and may reveal persistent difficulties. In the secondary school years, it is particularly important to focus on differential diagnostics, as at this age, symptoms may be mistaken for laziness, disinterest, or low motivation. Many students may suffer from secondary consequences such as anxiety, frustration, or behavioral disorders that overshadow the original learning disability (Kollárik & Pupala, 2001). In secondary school, developmental learning disorders manifest differently than in the first years of primary school. Although students have acquired the basic skills of reading and writing, difficulties in their practical use persist. Typical manifestations include a slower work pace; significant fatigue in writing tasks; difficulty comprehending more complex texts; increased misspellings; and difficulty with mathematical operations and logic problems (Snowling & Hulme, 2012). It should be emphasized that students with specific learning disorders often experience secondary psychological difficulties, such as anxiety, frustration, or lowered self-esteem (Horňák, 2015). Developmental learning disorders, although most commonly diagnosed in childhood, persist into adolescence and significantly affect the academic performance of students in secondary schools (Fletcher, Lyon, Fuchs, & Barnes, 2019). Their manifestations change during this period in line with increasing cognitive, linguistic, and academic demands. Typical manifestations can be systematically divided into several domains:

1.1.1. Language and Literary Difficulties

Deficits in decoding and reading comprehension: Students with dyslexia have persistent difficulties in reading quickly and accurately, leading to reduced comprehension of complex technical texts (Snowling & Hulme, 2012). Impaired ability to process and reproduce information: Problems with comprehension of verbal instructions and organization of written speech are manifested in difficulties in writing essays or problem-solving requiring structured responses (Wolf & Bowers, 1999).

1.1.2. Graphomotor and Spelling Difficulties

Persistent dysgraphia and dysorthography: Written speech is characterized by irregular, distorted handwriting, errors in spelling (including morphological and syntactic errors), and poor sentence structure (Kaplánová, 2019). Slowed writing pace: Due to the increased demand on graphomotor processes, performance on written tests is time-limited and inaccurate (Berninger & Wolf, 2016).

1.1.3. Mathematical and Logical Difficulties

Dyscalculic manifestations: These include difficulties in basic arithmetic operations, spatial orientation in mathematical problems, and difficulty applying logical rules to solve more complex problems (Butterworth, Varma, & Laurillard, 2011).

1.1.4. Executive Functions and Learning Organization

Impairments in executive functions: Students often exhibit difficulties in planning, organizing, and managing schoolwork, which are the result of impairments in cognitive processes such as working

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memory, inhibition, and cognitive flexibility (Meltzer, 2018). Procrastination and low self-regulation: Developmental learning disorders often correlate with problems in self-organization, which can lead to delays in completing assignments and stress before exams (Alloway, Gathercole, Kirkwood, & Elliott, 2009).

1.1.5. Psychosocial Impacts

Increased levels of anxiety and school stress: Persistent academic failure can lead to low academic self-esteem, higher levels of anxiety, and secondary emotional difficulties (Mugnaini, Lassi, La Malfa, & Albertini, 2009). Social isolation or defensive behavior: Some students may isolate themselves or exhibit defensive mechanisms in an attempt to protect their self-esteem from social stigma.

Table 1.
Manifestations and interventions of learning disorders in secondary schools.

Type of disorder	Typical manifestations	Recommended intervention
Dyslexia	Slow reading, problems with comprehension of technical texts	Extended reading time, audiobooks, and working with text using visual aids
Dysgraphia	Illegible handwriting, errors in sentence structure, slow writing	Submission of work electronically and development of graphomotor skills through exercises.
Dysortography	Systematic errors in spelling (i/y, soft, punctuation)	Spelling software, proofreading texts through other pupils, spelling training through IT technology
Dyscalculia	Problems with basic operations, digit substitution, and orientation in tasks	Use of visual aids (number scale), calculators, individual approach to problem solving.
Executive dysfunction	Poor planning, difficulties in organising learning	Individual learning plan, support in time management, and dividing tasks into smaller steps.
Psychosocial difficulties	Anxiety, school stress, and low self-confidence	Support from a school psychologist, relaxation techniques, and positive feedback.

As shown in Table 1, the manifestations of developmental learning disabilities in secondary schools are multilayered, affecting not only academic but also psychosocial life of adolescents. Their consistent identification and subsequent targeted support are key to ensuring a successful educational process and preventing further risks in psychosocial development. The diagnostics of developmental learning disabilities is a complex process that requires a multidisciplinary approach, the cooperation of special educators, psychologists, and teachers. In Slovakia, diagnosis is mainly carried out in Centres for Counselling and Prevention (CCP). Effective support in secondary schools includes an individual approach in evaluation; prolonged time for task completion; use of compensatory aids (e.g., computer, audiobooks); specific learning methodologies, such as multisensory learning (Orton-Gillingham approach); Moats and Dakin (2008)). One of the greatest challenges in working with students with specific learning disabilities is their early identification and the elimination of stigma. Research shows that appropriate intervention and support lead to significant improvements in both academic achievements and personal growth (Shaywitz et al., 2003). Raising teacher awareness, using modern diagnostic tools, and applying inclusive education methods are crucial for the future of education. As emphasized in Table 1, the manifestations of developmental learning disabilities in secondary schools are multifaceted, affecting not only the academic but also the psychosocial lives of adolescents. Their consistent identification and subsequent targeted support are key to ensuring a successful educational process and preventing further risks in psychosocial development. Developmental learning disorders are a serious phenomenon that has a significant impact on the educational and psychological functioning of secondary school students. Professional diagnosis, individual approach, and acceptance by the school environment are the basic pillars of successful inclusion of these students in the educational process.

2. Methods and Results

The aim of the study was to analyze the prevalence of specific developmental learning disorders (DLD) among secondary school students in the Slovak Republic during the period 2023-2025.

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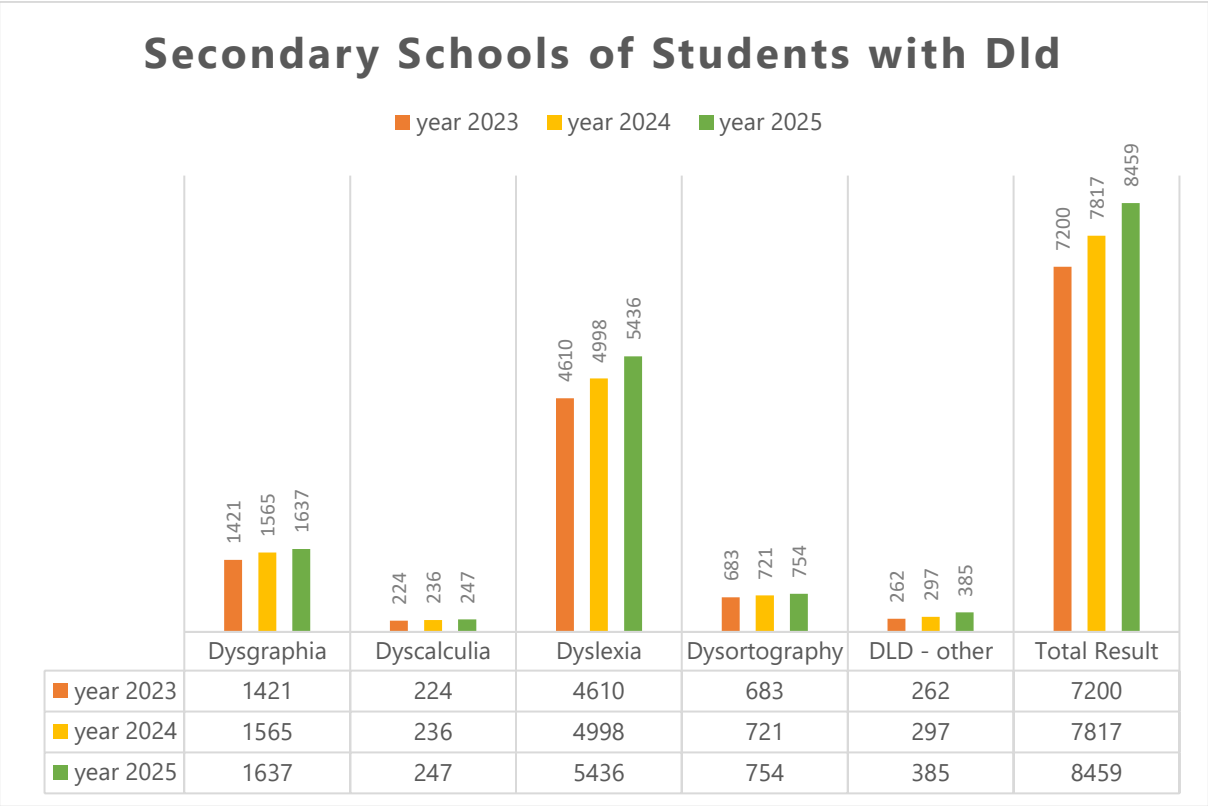
Descriptive and comparative analyses of quantitative data obtained from the databases of the Centres for Counseling and Prevention (CCP) and school counseling centers were used. Data were anonymized and aggregated by region, school type, gender, and type of disorder. Ethical approval was obtained from these centers in accordance with GDPR legislation. MS Excel software and basic statistical tools (arithmetic mean, percentage, year-on-year comparison) were used to process the data. The aim was to identify the dynamics of development in the prevalence of individual DLD and to compare the differences between school types and genders.



	Dysgraphia	Dyscalculia	Dyslexia	Dysortography	DLD - other	Total Result
year 2023	1421	224	4610	683	262	7200
year 2024	1565	236	4998	721	297	7817
year 2025	1637	247	5436	754	385	8459

Figure 1.
Analysis of the number of students with DLD in secondary schools between 2023-2025.

The graphical analysis shows the evolution of the number of secondary school students with learning disabilities (LD) in 2023, 2024, and 2025. The data are divided into four main categories of LDs, with each category showing different dynamics of evolution. The highest incidence was observed in the dyslexia category, which accounts for the largest proportion of all the DLD tracked. The number of students with dyslexia amounted to 4,610 in 2023, reached 4,998 in 2024, and increased to 5,436 in 2025. This significant increase indicates a growing need for educational intervention in this area. In the case of dysgraphia, there has been a gradual increase in the number of students. In 2023, 1,421 cases were registered, increasing to 1,565 in 2024 and reaching 1,637 in 2025. These data show a slight but consistent growth in this disorder. A similar trend can be observed for dyscalculia, where the number of students was 224 in 2023, increased to 236 in 2024, and reached 247 in 2025. This trend indicates a slight increase in the number of diagnosed cases over the study period. Dysorthographia has seen a slight but steady increase in the number of cases. In 2023, 683 students were registered with this disorder, increasing to 721 in 2024 and reaching 754 in 2025. The category of other developmental learning disorders deserves separate attention, where the most significant increase in the number of

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cases has been recorded. In 2023, 262 cases were registered; in 2024, the number increased to 297; and in 2025, it reached 385 cases, which shows the dynamic growth of this disorder group. The total number of students with specific developmental learning disorders shows continuous growth. In 2023, a total of 7,200 cases were registered, increasing to 7,817 in 2024 and reaching 8,459 in 2025. This trend indicates a steadily increasing number of students being diagnosed and suggests an increasing need for specialist intervention. In conclusion, the total number of students with specific learning disorders in secondary schools is increasing each year, with dyslexia accounting for the highest proportion. This development underlines the need to adapt educational strategies and provide adequate support for students with learning disorders.

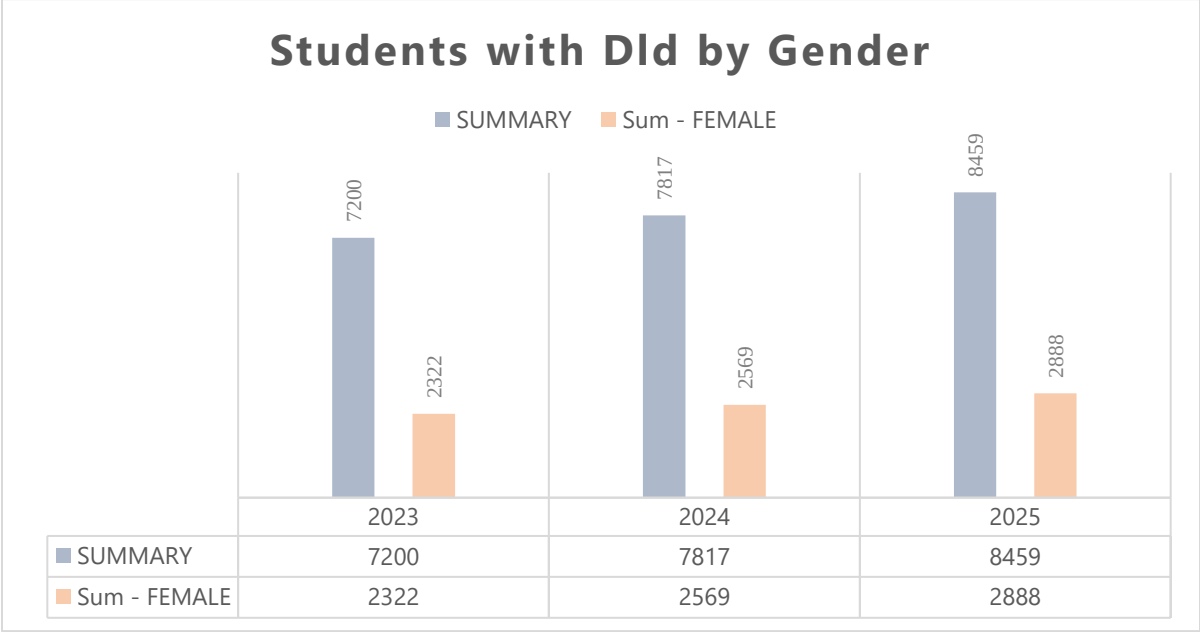

Figure 2.
Analysis of the number of DLD students in secondary schools by gender.

Analysis of the data indicates that the total number of students with developmental learning disabilities (DLD) has shown a continuous growth over the period under review. While in 2023 there were 7,200 registered students with DLD, the number increased to 7,817 in 2024 and reached 8,459 in 2025. A similar growth trend can be observed for girls with DLD, whose number increased from 2,322 in 2023 to 2,569 in 2024 and then to 2,888 in 2025. Despite this increase, the proportion of girls compared to boys remains significantly lower, suggesting that DLD is diagnosed more frequently in the male student population. The observed increase in diagnosed cases may be the result of better identification of developmental learning disabilities and the increasing availability of diagnostic and support mechanisms in the school setting. The increasing proportion of girls in the statistics may indicate an improvement in diagnostic methods that allow for more accurate identification of DLD in them as well. Research shows that the manifestations of DLD may differ between the sexes, with girls often showing less obvious symptoms, which may have led to their underestimation in the diagnostic process in the past. However, the overall increase in cases points to a growing need for adequate support for students with DLD, including the implementation of individual education plans, adapted teaching methods, and the presence of special educators.

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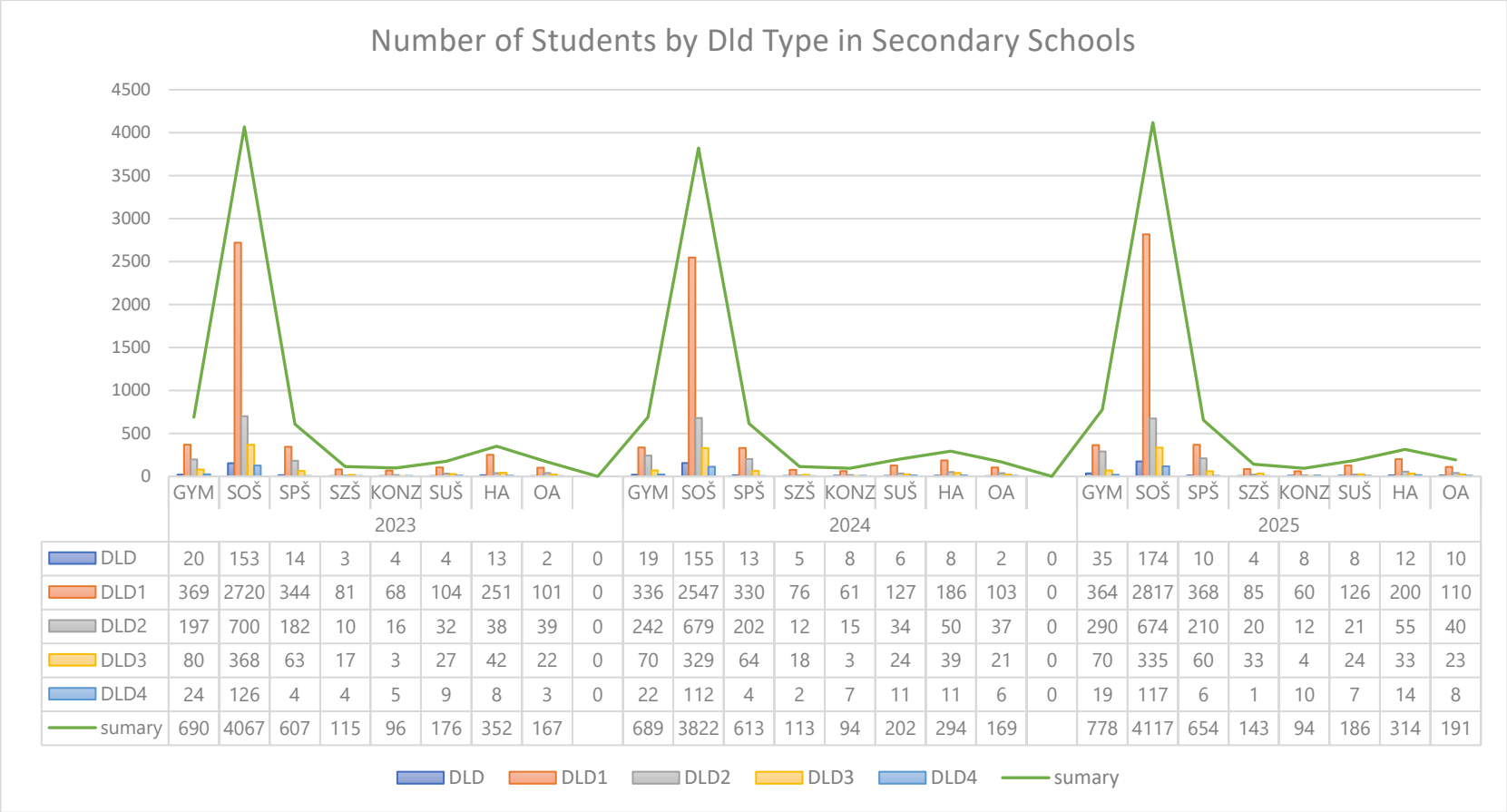

	GYM	SOŠ	SPŠ	SZŠ	KONZ	SUŠ	HA	OA		GYM	SOŠ	SPŠ	SZŠ	KONZ	SUŠ	HA	OA		GYM	SOŠ	SPŠ	SZŠ	KONZ	SUŠ	HA	OA
	2023									2024									2025							
DLD	20	153	14	3	4	4	13	2	0	19	155	13	5	8	6	8	2	0	35	174	10	4	8	8	12	10
DLD1	369	2720	344	81	68	104	251	101	0	336	2547	330	76	61	127	186	103	0	364	2817	368	85	60	126	200	110
DLD2	197	700	182	10	16	32	38	39	0	242	679	202	12	15	34	50	37	0	290	674	210	20	12	21	55	40
DLD3	80	368	63	17	3	27	42	22	0	70	329	64	18	3	24	39	21	0	70	335	60	33	4	24	33	23
DLD4	24	126	4	4	5	9	8	3	0	22	112	4	2	7	11	11	6	0	19	117	6	1	10	7	14	8
sumary	690	4067	607	115	96	176	352	167		689	3822	613	113	94	202	294	169		778	4117	654	143	94	186	314	191

Figure 3.
Analysis of the number of students by DLD type in secondary schools.

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Added information to the chart: The subtypes of DLD are represented by DLD (developmental learning disabilities - other), DLD1 (dyslexia), DLD2 (dysgraphia), DLD (dysorthography), DLD4 (dyscalculia).

The chart shows the number of students with specific developmental learning disorders (DLD) in each type of secondary school for the years 2023, 2024, and 2025. Based on qualitative analysis, several significant trends can be identified. The dominance of grammar schools (GS) is evident; these schools show the highest number of students with DLD in all years analyzed. This number is significantly higher compared to other types of schools, indicating either a higher diagnosis rate or a greater concentration of students with DLD in this type of educational institution. Other types of schools, such as vocational secondary schools (VSS), industrial schools (IS), medical schools (MS), conservatories (CONS), art schools (AS), hotel academies (HA), and business academies (BA), show lower and more stable numbers of students with DLD throughout the period under review. The distribution of students with DLD across school types remains relatively consistent in 2023, 2024, and 2025, indicating stable patterns of diagnostics and support for these disorders. The orange line in the graph, representing the total number of students diagnosed with DLD, shows a gradual increase. This trend aligns with the rising statistics of DLD diagnoses across the school system. The graph contains different shades of color representing various subtypes of DLD (DLD1, DLD2, DLD3, DLD4). Their distribution across schools is fairly even, but the overall numbers of each subtype are significantly lower compared to the overall incidence of DLD.

3. Discussion

Based on the data, a continuous increase in diagnosed cases of DLD can be observed, which is in line with trends abroad. In the USA, according to the National Center for Learning Disabilities (2020), the prevalence of specific learning disabilities is 13-15%. Similarly, in the Czech Republic, the prevalence is reported to be 10-12% (Krejčová & Vlčková, 2021) and in Germany, 7-8% (Wagner, Tschirner, & Starke, 2019). The Slovak data, with 8,459 pupils with DLD in 2023, represent comparable values, although this is probably an underestimate of the prevalence due to limited diagnostics, especially in vocational schools. In conclusion, the total number of students with learning disorders in secondary schools is increasing every year, with dyslexia accounting for the highest proportion. This development underlines the need to adapt educational strategies and provide adequate support for students with learning disorders. Based on the findings above, it is desirable to pay increased attention to the diagnosis of DPDs in girls, as their manifestations may be different from those in boys and, as a result, may be overlooked in the school environment. It is also important to support schools in implementing inclusive strategies to enable students with DLD to participate effectively in the educational process and to minimize the impact of their impairments on academic performance. In addition, it would be useful to analyze the factors that contribute to the higher prevalence of DLD in boys and to assess to what extent this difference is due to biological predispositions or to gender differences in the approach to diagnosing learning disorders. Based on the findings above, it is recommended to investigate the reasons for the higher diagnosis of DLD in grammar schools in more detail and to analyze whether this difference is due to a better approach to diagnostics, to a specific selection of students, or to other factors. Support secondary schools in diagnosing and working with students with DLD, for example, through training for teachers, expanding special education services, and increasing the availability of counseling centers. Continue to analyze trends in the prevalence of DLD in the school environment to identify whether this is a long-term upward trend and what factors are influencing it. Raising awareness of DLD among secondary school students and their consistent diagnosis are key to effective educational intervention. The introduction of individualized education plans and support measures contributes to improving school performance and reducing the psychological burden on students. Early identification and adequate support can make a significant difference to the quality of life of young people with learning disorders. The observed differences in diagnostics by gender point to the need to refine diagnostic tools and increase sensitivity in girls, whose manifestations are often less noticeable. The higher prevalence of

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DLD in grammar schools may be attributed to a combination of factors, including better access to specialists, higher awareness among parents and teachers, and higher performance expectations.

3.1. Implications for International Practice

The findings of this Slovak study are consistent with international research trends observed in the United States and the United Kingdom. In both contexts, the prevalence of developmental learning disorders (DLD), such as dyslexia, dysgraphia, and dyscalculia, has been steadily increasing over the past decade (National Center for Learning Disabilities, 2020; Snowling & Hulme, 2012). Similar to the present study, international evidence indicates that boys are diagnosed with learning disabilities more frequently than girls, which has been attributed to both biological and socio-cultural factors (Lyon, Shaywitz, & Shaywitz, 2003). From a diagnostic and educational perspective, the results support the call for early screening and a multidisciplinary approach to assessment, as promoted by the International Dyslexia Association and the British Dyslexia Association. The emphasis on individualized education plans, teacher training, and the use of multisensory teaching strategies parallels recommendations found in UK inclusion policies (Department for Education, 2019) and U.S. frameworks for Response to Intervention (RTI) (Fletcher et al., 2019). The Slovak data add an important comparative dimension to this global discourse, showing that the challenges of underdiagnosis and unequal access to counselling and special education services are not limited to English-speaking countries. Therefore, the findings have international relevance: they highlight the necessity of continuous teacher education, policy alignment with inclusive education principles, and the development of cross-national standards for diagnosing and supporting students with developmental learning disorders.

3.2. Recommendations for Practice

- Introduce systematic screening for developmental learning disorders in pupils in the first year of secondary school.
- Provide continuous training for teaching staff in the field of specific learning disorders (at least once every three years).
- Strengthen the network of school-based special educators, especially in secondary and post-secondary schools.
- Modify the framework curricula to explicitly consider the needs of pupils with SEN.
- Promote the introduction of individualized learning plans, the use of digital tools, and multisensory strategies.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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