Experiences of Students with Learning Disabilities in Higher Education: A Scoping Review

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ABSTRACT

Background: As the number of students with learning disabilities (SwLD) entering higher education (HE) increases, a need arises to improve the services provided to them by understanding their experiences. This scoping review explores the extent and type of evidence on the experiences of SwLD in HE.

Method: The review followed the six stages outlined by Arksey and O'Malley. PubMed, Science Direct, EBSCO, ProQuest, and APA PsycNet were searched for primary data, and studies published between January 2012 and July 2022 were included. The following information was extracted and collated from the included studies: author/s, year, location, objective/aim, study design, materials and methods, and major findings.

Results: The search yielded 3729 titles and abstracts. Their screening resulted in 26 eligible articles. The review of these articles identified three major themes: (a) academic concerns, (b) psychosocial experiences, and (c) support systems and accommodations. The academic concerns included difficulties in areas such as reading, writing, and spelling. The studies on psychosocial experiences showed that SwLD experience stress, anxiety, and lower self-esteem. The studies on support systems and accommodations indicate that they get academic support, technological support, and extra time for examinations from educational institutions.

Conclusion: The SwLD experiences academic and psychosocial challenges during higher studies. However, the existing support systems do not address these challenges, and there is a need for further research in this area.

Keywords: Learning disability, students, higher education, experience, scoping review

Students with disabilities entering higher education (HE) are increasing; the most commonly reported disability among them is specific learning disabilities.[1] They are underserved and underprepared for the demands of HE.[2] The prevalence of learning disorders among children is 5–15%.[3] According to the National Longitudinal Transition Study II, only 41% of adults with learning disabilities obtain a postsecondary education degree, compared to a 52% completion rate for the general population.[4] This shows poor academic enrolment, completion of courses, and degree attainment among students with learning disabilities (SwLD) in HE.

For SwLD, the transition from school to HE institutions can be challenging.[5] Schools are often required to identify learning disabilities early and report them.[6] However, more procedural and documentation guidelines are needed for colleges and universities.[7] One study reported that in HE, the responsibility of reporting the learning disability lies with the student.[5] The stigma associated with the diagnosis of a learning disability prevents some students from disclosing their issues.[8] Besides these issues, institutions lack the knowledge, skills, and support systems to address

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their needs. Also, the stigma and these institutional factors impact the quality of teacher-student relationships, which becomes a barrier to effective learning.[9] Even though SwLD get enrolled in HE, they perform poorly in academics.[10] As a result, they may experience significant psychosocial challenges and have a higher risk of dropping out of college.[11] Moreover, the literature on adults with learning disabilities is limited.[12]

One of the systematic reviews conducted a decade ago explored how the inclusion of students with dyslexia can be fostered in HE.[13] It included six studies out of 15 that were predominantly small qualitative studies from Western countries, with low to medium-level methodological rigour.[13] Furthermore, there is a need to understand the concerns and challenges of SwLD in HE to ensure quality education, which may lead to better academic and long-term personal outcomes. Hence, this review bridges the gap by exploring the available body of literature on the experiences of SwLD in HE, using the scoping review method of Arksey & O'Malley.[14]

Methods

A scoping review was conducted on the articles published between January 2012 and June 2022, based on the scoping review methodological framework,[14] which includes the following stages: identifying the research question (stage 1), identifying the relevant studies (stage 2), selecting the studies (stage 3), charting the data (stage 4), and collating, summarizing, and reporting the results (stage 5). The review has been drafted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Extension for a scoping review.[15]

Review Question

The question for this scoping review was, 'What are the experiences of SwLD in HE?'

Identifying the Relevant Studies

Based on the review question, the first and second authors built the search terms (**Table 1**). The first author primarily searched for the relevant titles and abstracts in Science Direct, PubMed, EBSCO, ProQuest, and APA PsycNet. Later, the second author independently verified the titles and abstracts in those databases using the same search terms, for consistency. The search was carried out between July and August 2022.

Study Selection

The selection of relevant studies is shown in the PRISMA flow chart (**Figure 1**). Study selection involved initial screening of titles, abstracts, and, subsequently, full text. The studies were included if

TABLE 1.

Search Strategy Used in Databases From January 2012 to July 2022.

Data Bases	Search Terms
Science direct	("specific learning disorder" OR "specific learning disabilities" OR "specific learning disability" AND "higher education")
EBSCO	("specific learning disorder" OR "specific learning disabilities" OR "specific learning disability" AND "higher education")
PubMed	((Learning Disability) OR (learning disabilities) OR (specific learning disorder) AND (higher education))
ProQuest	(ti(learning disability) OR ti(learning disabilities) OR ti (specific learning disorder) AND ti(higher education) NOT ti(child))
APA PsycNet	Title: learning disabilities OR Title: learning disability OR Title: specific learning disorder AND Title: higher education NOT Title: child

FIGURE 1.

Prisma Flow Chart of the Study Selection for the Review.
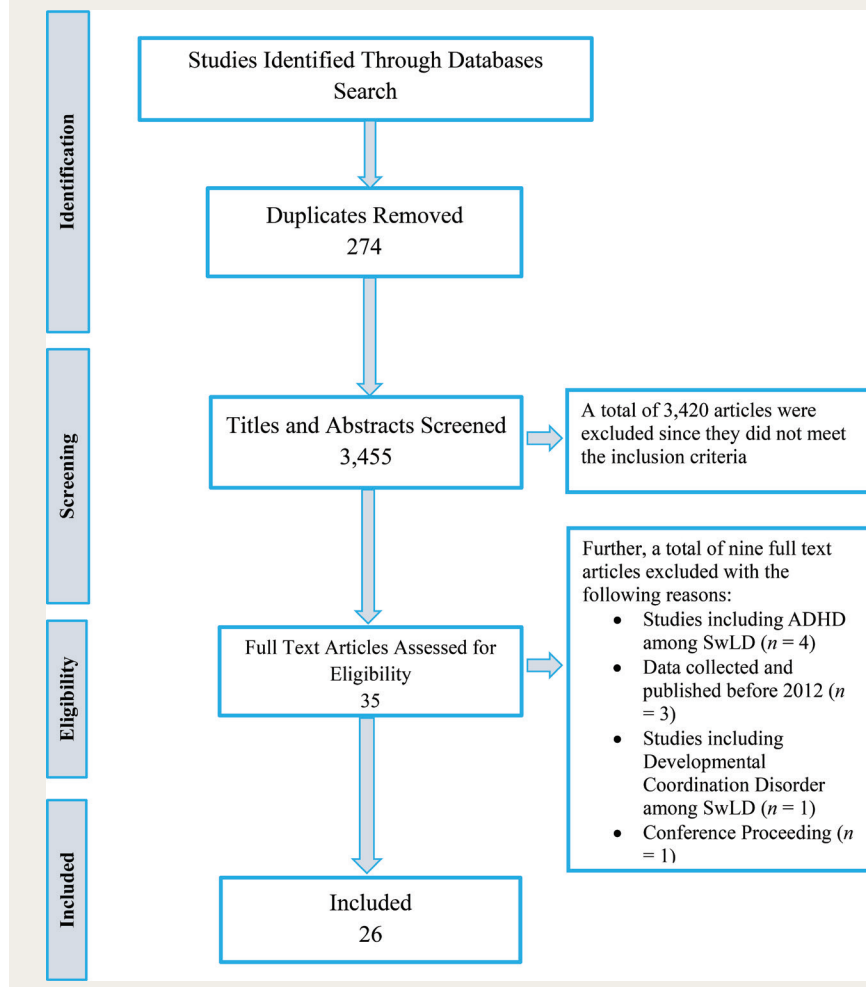
published between January 2012 and June 2022; in English; full text is available; conducted among students with specific learning disabilities or disorders such as dyslexia, dysgraphia, or dyscalculia, and specifically explored experiences of SwLD in HE. In this context, HE refers to students enrolled in undergraduate and above-level courses. The exclusion criteria were studies focusing on children with specific learning disabilities, studies on adolescents or adults with specific learning disabilities who are not enrolled in undergraduate or postgraduate programs, studies on students in HE with specific learning disabilities who have comorbid conditions, or any other studies primarily unrelated to the experiences of SwLD in HE (Detailed description of the excluded articles are in supplementary file 1). The disagreements regarding inclusion were discussed between the authors and resolved.

Quality Appraisal

To evaluate the reporting quality of the selected studies, we used separate JBI Critical Appraisal Checklists for cross-sectional studies,[16] qualitative research,[17] and systematic reviews.[18] (Refer to supplementary files 2, 3, and 4 for further details).

Charting the Data

The full texts of the selected articles were read in detail. The charting process was guided by the review question. The following data were extracted from each study: authors, year, country, aim/objectives, study design, materials and methods, and major findings. They were organised thematically.

Results

The literature search yielded a total of 3,729 records. Two hundred seventy-four duplicate titles were removed, and the remaining 3,455 records were screened based on the selection criteria, of which 3,420 were excluded based on the selection criteria, and 35 underwent further screening. Eventually, 26 articles were included in the final review. Nine articles were excluded for the following reasons: (a) Four included Attention Deficit Hyperactivity Disorder among SwLD, (b) Three had data collected before 2012, (c) One included Developmental Coordination Disorder among SwLD, and (d) One was a Conference Proceeding (**Figure 1**).

Characteristics of the Included Studies

Among the 26 articles reviewed, there were 13 cross-sectional comparative studies,[19-31] four cross-sectional studies,[32-34] four exploratory studies,[35-39] two systematic reviews,[13,40] one grounded-theory qualitative study,[41] one discourse-based qualitative study[42] and one based on participatory action framework.[43]

Most studies were conducted in European countries such as the United Kingdom,[22,41] Belgium,[19,20,28] Sweden,[39] Denmark,[25,26] France,[31] Ireland,[42] and Italy.[23] Other studies were conducted in the USA,[32-35] Australia,[36,38] Taiwan,[24] Israel,[21,27,29,30,43] and Saudi Arabia.[37] Reviewers of the systematic review were located in the USA,[40] Italy, and the United Kingdom.[13]

Major Themes

Our data synthesis generated mainly three themes: (a) Academic concerns, (b) Psychosocial experiences, and (c) Support Systems and accommodations (refer to supplementary file 5 for all the themes).

Academic Concerns

Eleven studies reported major academic concerns faced by SwLD (**Table 2**).[19,20,26-28,31,32,34,36,39,41] The concerns[32] included selective deficits in writing,[19,27,41] reading, arithmetic, and phonological processing[19] and problems in spelling, rapid naming, mental calculations, orthographical skills, comprehension, the meaning of words, reading a foreign language, written word recognition, and impairment in accuracy, speed, and efficiency.[20,26,31] Except for spelling, the deficits were larger for speed-related than accuracy-related assessments.[19] SwLD needed help with assignments, taking notes, following lecture slides, reading text online, and using learning technologies and had more obstacles caused by the non-academic responsibilities.[34,36,39] One of the studies compared the metacognitive competence between students with and without dyslexia.[28] They employed a word spelling task, a proofreading task, and signal detection analysis for this purpose.[28] Despite the fact that students with dyslexia made more errors in these tasks, there was no significant difference in terms of metacognitive competence between those with and without dyslexia.[28] This suggests that they are aware of the errors.[28]

Psychosocial Experiences

Eleven studies reported on the psychosocial experiences of SwLD in HE (**Table 3**).[13,21-25,35,36,38,42,43] Of these, one explored the perceived academic self-efficacy and predictors of psychological well-being of university students in Italy and reported a positive psychosocial experience; for example, SwLD did not report significantly lower levels of self-efficacy compared to students without learning disabilities.[23] However, other studies reported negative psychosocial outcomes. The learning challenges affected learning-disabled students' quality of life regarding stress, anxiety, self-esteem, time available for other activities, personal relationships, financial pressures,[22,38] and performance in academic programs.[25] Similarly, studies reported that they face significantly higher levels of worrying and denial,[22] poor academic self-concepts, and lower global self-worth compared to students without learning disabilities.[21] Furthermore, a systematic review reported that to avoid embarrassment or stigmatisation, SwLD in HE preferred to give up the opportunity to receive support and did not disclose their dyslexic identity.[13] A qualitative study with discourse-based design and narrative synthesis reported that students with dyslexia identified themselves as stupid, which was persistent for most students.[42]

Under the psychosocial experiences theme, six studies reported the coping strategies SwLD used.[13,22,24,35,36,43] Students with dyslexia planned to seek instrumental and emotional support, use positive reinterpretation and suppress competing activities,[22] read selectively and strategically, and find videos online for their learning.[36] Similarly, a systematic review reported that they overcome their difficulties using study skills (e.g., identifying key points, underlining sentences, accessing materials in multiple formats, and using visual and oral techniques), compensatory strategies

TABLE 2.

An Overview of Articles Relating to Academic Concerns Faced by Students with Learning Disabilities in HE.

	Author, Year, Location	Purpose	Nature of Study	Population	Materials and Methods		Major Findings
1	Callens et al., 2012[19] Belgium	To obtain evidence on cognitive profile of students diagnosed with dyslexia entering in HE	Cross-sectional comparative study	Dyslexic ($n = 100$) and control group without LD[1] ($n = 100$)	Kaufman Adolescent and Adult Intelligence Test[49] GL&SCHR—an established test battery for diagnosing dyslexia in young adults[50] Interactive Dyslexia Test Amsterdam-Antwerp[51]	Cohen's d effect sizes	Students with dyslexia have selective deficits in reading and writing (effect sizes for accuracy between $d = 1$ and $d = 2$), arithmetic ($d < 1$), and phonological processing ($d.0.7$).
2	Carter & Sellman, 2013[41] UK	Based on socio-cultural theory exploring how differences in essay writing experiences are constituted for a dyslexic student community	Grounded theory	Dyslexics ($n = 7$) and non-dyslexics ($n = 4$)	Semi-structured interviews	Grounded theory	More inclusive approach will benefit specially to support in writing.
3	Callens et al., 2014[20] Belgium	Exploratory factor analysis of Cognitive functioning of students with dyslexia in HE	Cross-sectional comparative study	Dyslexics ($n = 100$) and control group ($n = 100$)	Dutch version of the KAIT[2,49] for measures of intelligence. GL&SCHR—an established test battery for diagnosing dyslexia in young adults[50] Interactive Dyslexia Test Amsterdam–Antwerp (IDAA)[52]	Exploratory factor analysis	The factors related to phonology, reading, reading fluency, spelling, flashed orthography, naming, and math, resulted in large effect sizes.
4	Olofsson et al., 2015[39] Sweden	Focus on the study outcomes of dyslexic students in universities	Cross sectional	Dyslexics ($n = 50$)	Semi-structured question guide & self-report scale	Mean & standard deviation	More than half of the students are examined at a normal rate of study but that about one fifth have a very low rate of study.
5	Cavalli et al., 2016[31] France	Identify the skills, specifically vocabulary skills developed by dyslexic students that may contribute to their literacy skills	Cross-sectional comparative study	Dyslexics ($n = 20$) and normal readers ($n = 20$)	EVALEC[3,53] EVIP[4,54] ARHQ[5,55]	Rasch rating scale model. Single-case studies	Dyslexic group's performance was significantly slower and less accurate than that of control group (accuracy: $p < .001$; response time: $p < .001$).
6	McGregor et al., 2016[34] USA	Explore the university experiences of students with learning disabilities	Cross-sectional study	63,802 responses of this 5.96% having self-reported LD	Student experience in the research university survey	Mean & SD[6]	Students with self-reported learning disabilities were less satisfied with their overall university experience.
7	Pedersen et al., 2016[26] Denmark	Examine the quality of oral reading and how it relates to reading comprehension in university students with dyslexia	Cross-sectional comparative study	Dyslexic students ($n = 16$) & no history of reading problems ($n = 16$)	Measured reading speed, reading errors and self-corrections during reading. Reading comprehension was measured using aided text retellings.	Independent samples t-test	Dyslexics performed poorer on most measures, and little association between how well university students with dyslexia read aloud and comprehend the text

(Table 2 continued)

(Table 2 continued)

	Author, Year, Location	Purpose	Nature of Study	Population	Materials and Methods		Major Findings
8	Weis et al., 2017[32] USA	Examine psycho-educational functioning of students diagnosed with learning disabilities at a selective, private, liberal arts and science college	Cross-sectional study	Undergraduate SwLD[7] and were receiving academic accommodations for their conditions ($n = 154$)	Review of documents submitted in disability office	Mean & *SD*	Most lacked objective evidence of prior academic difficulties and relative or normative deficits in broad academic skills or fluency.
9	Tal-Saban & Weintraub, 2019[27] Israel	Examines the motor skills and motor-related daily functions of students with and without dysgraphia in HE, and their contribution in predicting handwriting performance.	Cross-sectional comparative study	Dysgraphic ($n = 48$) and without any known developmental disorder ($n = 34$)	Student background questionnaire, handwriting performance of post-secondary students evaluation[56] Adult self-report scale-v1.1-Part A.[57] Finger succession[58] Purdue Pegboard test [59] Rey complex figure test and recognition trial[60] Adolescents and adults coordination questionnaire[61]	Mean, standard deviation correlations and logistic regression	Students without any developmental disorder had significantly better motor skills and motor-related daily functions.
10	Tops et al., 2014[28] Belgium	Examine whether meta cognitive experience can help academic and professional students with dyslexia compensate for their spelling deficiencies.	Cross-sectional comparative study	Dyslexics ($n = 100$) control group ($n = 100$)	Verbal tests: Word reading,[62] pseudoword reading[63] Word spelling.[50] Kaufman adolescent and adult intelligence test, Dutch version[49]	Mean, *SD*, signal detection analysis	Additional metacognitive experience training in HE will have no effect on dyslexic students.
11	MacCullagh et al., 2017[36] Australia	Explore the learning experiences of dyslexic university students and the factors that contribute to their success	Exploratory design	Dyslexics ($n = 13$) & non-dyslexic peers ($n = 20$)	Semi-structured interview guide	Thematic analysis	Students with dyslexia have difficulty in following lecture slides and note taking

(e.g., collecting lecture notes, recording lectures, and downloading materials before the class), help from family and friends (e.g., in revising, editing, and writing), and meta-cognitive (e.g., self-organisation skills like time planning and essay plan diagrams) and meta affective (e.g., reducing distractions and creating comfort zone) skills.[13]

Another study found that SwLDs use cognitive and behavioural strategies to overcome their challenges on the virtual campus.[35] One study examined the definition of success and the factors that promoted it among graduates with learning disabilities and reported the following factors: (a) setting goals and objectives, (b) persistence, (c) self-belief, (d) perceiving their learning disability as a driving force, (e) feeling driven, (f) proving to others, (g) using organisation strategies, (h) adjusting with the environment, and (i) networking.[43] However, SwLD employed fewer learning strategies than other students.[22,24]

Support Systems and Accommodations

Nine studies highlighted the significant role of support systems and accommodations provided for SwLD (**Table 4**).[13,28-30,32-34,37,40] A study to assess educational support requirements and affordances reported that post-graduate students, in comparison to undergraduate students, need more writing assistance.[37] Similarly, a study that examined the adequacy of entrance criteria to academic studies for SwLD in college reported that support services increase their chances of success in studies.[30] In another study, SwLD who got support from institutions reported lower procrastination levels than those who did not.[29]

Another study stated that students with accommodations provided by the institutions reported less difficulty with assignments and more contact with faculty.[34] Furthermore, review studies reported on interventions and accommodations for SwLD in HE, such as (a) assistive technology (e.g., speech synthesis systems and voice recognition software), (b) direct assistance (e.g., trained peer tutor, intervention specialist, and

TABLE 3.

An Overview of Articles Relating to Psycho-social Experiences of Students with Learning Disabilities in HE.

	Author, Year, Location	Purpose	Study Design	Population	Materials and Methods		Finding
1	Hollins & Foley, 2013[35] USA	The experiences of college SwLD as they interacted with this virtual campus	Exploratory design	Students with documented LD[8] (n = 16)	Observation & interview	Thematic analysis	Factors that impacted performance included features of the virtual campus and participants' implementation of cognitive and behavioural strategies.
2	Shany et al., 2013[21] Israel	This study investigated the association among friendship, global self-worth, and domain-specific self-concepts of university students with and without learning disability	Cross-sectional comparative design	Students with and without LD (n = 102)	Self-perception profile for college students[64] Friendship Questionnaire (developed for the current study) Intimate Friendship Scale (IFS)[65]	Mean, SD,[9] and two-way MANOVA, hierarchical regression analysis	SwLD reported more stable friendships than those without LD.
3	Jordan et al., 2014[22] UK	Examine the levels of mathematics and statistics anxiety, as well as general mental wellbeing, among dyslexic undergraduate students.	Cross-sectional comparative design	Dyslexics (n = 28) and non-dyslexics (n = 71)	Statistics anxiety rating scale,[66] Mathematics anxiety rating scale: Short version[67] COPE[10,68] Rosenberg self-esteem scale[69] Penn state worry scale[70]	Multivariate analysis hierarchical multiple regression	There was significant univariate difference on mathematics anxiety (F(1,97) = 9.47; p = .003; partial η^2 = .09; Power = 86%), with higher levels of mathematics anxiety reported by the dyslexia group compared with the typical reading ability group.
4	Pino & Mortari, 2014[13] Italy & UK	Systematic review on inclusion of students with dyslexia in HE.	Systematic review	ERIC, PsycCRITIQUES, PsycInfo, Scopus, ISI Web of Science, ASSIA, International Bibliography of the Social Sciences, ProQuest Dissertations & Theses, ProQuest Education Journals, ProQuest Career and Technical Education, Academic Search Premier, and Medlin	Critical appraisal: EPPI[11] centre[71,72]	Thematic	Students are experiencing stress and anxiety due to assessment procedures.
5	Evans, 2014[42] Ireland	Describe how students in nurse education discursively construct their dyslexic identities	Discourse-based design	Dyslexics (n = 12)	Interviews	Identity analysis & narrative–discursive approach	The majority did not reveal their dyslexia identity in practice settings.
6	MacCullagh et al., 2017[36] Australia	Explore the learning experiences of dyslexic university students and the factors that contribute to their Success	Exploratory design	Dyslexics (n = 13) & non-dyslexic peers (n = 20)	Semi-structured interview guide	Thematic analysis	Students with dyslexia make an effort to participate in intensive, consistent, and strategic learning program.

(Table 3 continued)

	Author, Year, Location	Purpose	Study Design	Population	Materials and Methods		Finding
7	Lambert & Dryer, 2018[38] Australia	Quality of Life of SwLD in HE who are studying online	Exploratory design	SwLD[12] (n = 8)	Semi-structured interviews	Content analysis	Frustrations dealing with learning challenges can negatively impact on a range of quality-of-life domains
8	Bønnerup et al., 2019[25] Denmark	Exploring difference in some aspects of the literacy skills among students with dyslexia attending university programme and territory education professional programs	Cross-sectional comparative study	Dyslexics (n = 32), dyslexics attending professional programs (n = 32), control university students (n = 31), and control students from professional programs (n = 30)	Pseudoword reading, phonological choice, vocabulary, reading, spelling of morphologically complex single words, and reading aloud from a syntactically complex text.	Mean, *SD*, correlation	Phonological deficits are affecting the performance of dyslexic students in professional program and where dyslexic students in university were able to limit it by relying on alternatives
9	Russak & Hellwing, 2019[43] Israel	The study contributes to the field of success studies by examining how graduates with learning disabilities from a university define success and the factors they feel contribute to their success	Participatory action framework	SwLD who have used service of support centre (n = 8)	Interviews	Analysis was conducted in five phases derived from the work of Braun & Clarke[73]	The graduates expressed the belief that their LDs are the source of their distinctive strengths.
10	Matteucci & Soncini, 2021[23] Italy	The study aims to investigate the perceived academic self-efficacy and to identify predictors of psychological well-being in a sample of university students with SLD[13] compared to a control group of students without SLD.	Cross-sectional comparative study	Students with LD (n = 60) and LD (n = 283)	Online self-report questionnaire multidimensional scale of perceived social support[74] Single-item self-esteem scale[75] Academic self-efficacy scale[76] Warwick-Edinburgh mental well-being scale[77]	t-tests multivariate regression analysis	Self-esteem and perceived social support by significant others did significantly predict the value of psychological well-being in students with SLD
11	Wang & Chung, 2022[24] Taiwan	This study investigated the learning strategies that university students with specific learning disabilities report using in the Chinese language context. .	Cross-sectional comparative study	SwLD (n = 105) & peers (n = 134)	Hong Kong Reading and Writing Behaviour Checklist for Adults School Motivation and Learning Strategies Inventory–College[78] Metacognitive Awareness Inventory[79]	ANCOVA, linear regressions	Students with SLD[14] reported using fewer learning strategies than students without SLD.

individual tutoring), (c) teaching learning strategies (e.g., strategic content learning instruction, paired associates learning strategy, text-structure strategies, test-taking strategy, and structured writing strategy), and (d) comprehensive support program (e.g., individual, group, and multiple types of interventions based on needs).[13,40] Additionally, one of the studies explored what academic accommodations the clinicians recommend for SwLD when they get referrals and this study also assessed whether those recommendations were supported by the students' data.[33] The clinicians recommended the following accommodations in HE for postsecondary SwLD: (a) additional time on exams, (b) allowing to use technology

TABLE 4.

An Overview of Articles Relating to Support Systems and Accommodations for Students with Learning Disabilities in HE.

	Author, Year, Location	Purpose	Nature of Study	Population	Materials & Methods		Finding
1	Weis et al., 2016[33] USA	Examine accommodation decision making for post-secondary SwLD[15] by clinicians	Cross-sectional study	Community college students receiving academic accommodations for LD[16] ($n = 359$)	Examination of documents	Percentage	Clinicians often recommended accommodations that were not specific to the student's diagnosis
2	Tops et al., 2014[28] Belgium	Examine whether meta cognitive experience can help academic and professional students with dyslexia compensate for their spelling deficiencies.	Cross-sectional comparative study	Dyslexics ($n = 100$) control group ($n = 100$)	Verbal tests: Word reading,[62] Pseudoword reading,[63] Word spelling[50] Kaufman Adolescent and Adult Intelligence Test, Dutch version[49]	Mean, SD,[17] Signal Detection Analysis	Extra training on metacognitive experience in HE will not create any impact on dyslexic students
3	Hen, 2018[29] Israel	Examine the differences between learning disabled (LD), non-learning disabled, and supported learning-disabled students in terms of academic procrastination.	Cross-sectional study	UG[18] students without LD ($n = 335$), supported for LD ($n = 61$) and unsupported for LD ($n = 112$)	Online questionnaire: Academic procrastination student form.[80] Feelings of the students toward procrastination were measured by items adopted from Milgrm, Mey-Tal & Levinson (1998).[81]	MANOVA	The results indicated that the overall model for the group effect on academic procrastination and feelings toward it was significant ($F_{(12,501)} = 7.02$; $p < .001$).
4	Zeng et al., 2018[40] USA	Examine the interventions currently used to support students with LD in postsecondary education	Systematic review		Databases: Education Resources Information Centre (ERIC), Academic Search Complete, Education Research Complete, PsycINFO, Psychology and Behavioural Sciences Collection, and Education Full Text	Content analysis	Four primary types of interventions were identified: assistive technology, direct assistance, strategy instruction, & comprehensive support program.
5	Sarid et al., 2020[30] Israel	Examined the adequacy of entrance criteria to academic studies for SwLD and the effectiveness of three support levels during their academic studies in increasing their academic gains.	Cross-sectional comparative study	Graduates with LD ($n = 315$) and graduates who do not have LD ($n = 955$)	Researchers retrieved data from college data base	One way & two-way ANOVA, regression analyses,	Although the admission scores of graduates with LD were lower than those of NLD[19] graduates, their GPA[20] was higher than the GPA of NLD graduates.
6	Abed & Shackelford, 2020[37] Saudi-Arabia	Asses educational support requirements and affordances for undergraduate and postgraduate SwLD	Exploratory study	Under graduation ($n = 16$) and post graduation ($n = 6$) students with LD	Semi-structured interviews	Phenomenological analysis	Enough staff needed for disability services who can support special needs of learners
7	McGregor et al., 2016[34] USA	Explore the university experiences of students with learning disabilities	Cross-sectional study	63,802 responses of this 5.96% having self-reported LD	Student experience in the research university survey	Mean & SD	Students who received accommodations received less difficulty with assignments and more contact with faculty

(Table 4 continued)

	Author, Year, Location	Purpose	Nature of Study	Population	Materials & Methods		Finding
8	Weis et al., 2017[32] USA	Examine psycho-educational functioning of students diagnosed with learning disabilities at a selective, private, liberal arts and science college	Cross-sectional study	Undergraduate SwLD and were receiving academic accommodations for their conditions (n = 154)	Review of documents submitted in disability office	Mean & *SD*	Additional time on exams (88.3%), separate room for exams (34%), individual tutoring (55.8), and access to lecture notes (33.8)
9	Pino & Mortari, 2014[13] Italy & UK	Systematic review on inclusion of students with dyslexia in HE.	Systematic review	ERIC, PsycCRITIQUES, PsycInfo, Scopus, ISI Web of Science, ASSIA, International Bibliography of the Social Sciences, ProQuest Dissertations & Theses, ProQuest Education Journals, ProQuest Career and Technical Education, Academic Search Premier and Medline	Critical appraisal-EPPI[21] centre[71,72]	Thematic	Accessibility and adjustments include modifications of examination protocols, use of laptops, note takers, substituting written exam, use of assistive, information, and communication technologies

during exams, (c) modified and shortened assignments, (d) reader for students with reading difficulties, (e) curriculum waivers, (f) individual tutoring, and (g) access to lecture notes.[33] However, the students' data did not support the clinician's recommendations, because the findings indicate that clinicians often recommend accommodations to college students without evidence supporting their provision, which means that their recommendations correspond very little to the students' learning disabilities and contexts.[33]

Quality Appraisal Results

This review utilised the JBI critical appraisal checklist for cross-sectional quantitative studies, qualitative studies, and reviews. The appraisal revealed that, except for one study,[34] all 16 cross-sectional or cross-sectional comparative studies, exhibited a low risk of bias. These studies have received a six score out of eight. This is because all those studies did not report identification and strategies to control confounders, as they were unclearly reported.

In relation to the qualitative studies, over half of them did not clearly report obtaining ethical approval. However, their scores on a 10-point checklist ranged from 7 to 10 indicating a low risk of bias. As for the reviews, one review did not report 4 out of 11 checklist items indicating a moderate risk of bias.[40] On the other hand, another systematic review reported ten out of eleven on the checklist suggesting a very low risk of bias[13] (Refer to supplementary files 2, 3, and 4 for further details).

Discussion

To the best of our knowledge, this is the first scoping review to report the experiences of SwLD in HE. The review included 26 articles, and the consistent finding was that SwLDs experience several challenges while pursuing higher studies.

This review categorises the findings of the included studies into three broad themes: academic concerns, psychosocial experiences, support systems, and accommodations. The findings of this review give valuable insights into the academic concerns experienced by SwLD in HE.[19,20,26,27,31,32,34,39,41] These difficulties affect their academic success.[44,45] So, to improve their academic performance, different types of interventions are needed, which can be provided either individually or in a group format. One study suggested teaching them strategies to learn, write, and take tests.[40]

Additionally, this review's results reveal that SwLD has a higher risk for psychosocial problems.[13,19-23,25-27,31,32,34,38,39,41,42] Teachers and administrators should be sensitive to these problems. These findings are consistent with previously published studies conducted before this review's time frame. They reported negative psychosocial experiences such as anxiety,[46] fear of invoking stigma,[47] and stress.[48] A few studies found that SwLD could manage their difficulties using positive coping strategies, although they experience academic and psychosocial issues.[22,24,35,36,43] One study recommended positive reframing and thought challenging with

individualised support, to improve the psychosocial experiences among SwLD.[22] However, there is a need to explore the effectiveness of these strategies in low-resource countries with more research.

Our findings justify the need for support systems for SwLD in HE besides their practical implications.[28-30,33,37,40] They also underline the importance of reducing the learning barriers by providing accommodations and multifaceted or comprehensive support programs. Additionally, the findings indicate that accommodations and support systems were associated with positive outcomes.[29,30,34] Therefore, future research should focus on the effectiveness of possible accommodations in HE. Similarly, professionals and peers can be trained to provide emotional and academic support to help SwLD overcome their challenges.

Furthermore, most of the reviewed studies compared the experiences of SwLD with their non-learning-disabled peers.[19-31,36,41] Several of these studies reported that SwLD (a) have difficulties in reading, writing, phonological processing, spelling, written word recognition, and handwriting, (b) are less satisfied, and (c) face lower academic self-concept and greater levels of worry, denial, frustration, and procrastination in comparison to students without any disabilities.[19,21,22,24-27,29,31,34,36,41]

Seven of the included studies were qualitative, and they reported on the experiences in essay writing[41] and virtual campus,[35] discourses on dyslexic identity,[42] learning practices,[36] support requirements,[37] quality of life,[38] and success factors.[43] However, these studies did not report qualitative rigor[35,41,43] or ethics approval.[35-38,41-43]

The quantitative studies reported on cognitive functioning,[19,20] study outcomes,[39] vocabulary skills,[31] university experience,[34] reading comprehension,[26] motor skills,[27] friendship predictors,[21] levels of mathematics anxiety,[22] literacy skills,[25] academic self-efficacy,[23] learning strategies,[24] meta-cognition,[28] academic procrastination,[29] accommodation decision making[32,33] and effectiveness of support services.[30] Most reported adequate information on the inclusion criteria and study subjects.[19-23,25-33,39] However, a few cross-sectional studies

were small in terms of sample size.[26,31,39] We found a need for more interventions in addressing the issues of SwLD in HE. Hence, there is a need for longitudinal research with large sample sizes and experimental design to fill the gaps in the existing literature.

The findings of some of the reviewed studies cannot be generalised or transferred, as they were conducted in individual institutions or universities.[22,23,25-27,29-32,36,38,41,43] Also, the current literature available is predominantly from European countries.[19,20,22,23,25,26,28,31,39,41,42] Therefore, further research should happen in different cultural contexts around the globe.

While this review was carried out in accordance with the established scoping review methodology, it is important to acknowledge several limitations worth noting. The review included only published studies and did not consider grey literature, which may give valuable insights. Additionally, including solely English-language publications may restrict the breadth of knowledge obtained from non-English-speaking countries. Despite these limitations, this scoping review has enabled us to comprehensively examine the breadth of the literature, identify the knowledge gaps, and enhance our understanding of the experiences of SwLD in HE.

In conclusion, the review found that SwLDs have diverse experiences in HE. These include academic difficulties such as those in reading, writing, spelling, and phonological processing. They also experience psychosocial consequences such as stress, anxiety, and stigma while seeking help. Despite these, they could overcome their challenges using positive coping mechanisms. This review stresses the importance of support systems in the life of SwLD and emphasises the necessity for a more inclusive approach in HE institutions. Our findings suggest a need for more studies from the global south where there is high cultural diversity and highlight the need to formulate policies for including SwLD in mainstream education. Also, developing intervention research and testing them for their effectiveness with rigorous methods is the need of the hour.

Author Contributions

Both authors participated in conceptualisation, study design, development of search terms, and literature search in the databases. The first author conducted the primary screening and selected the relevant articles. The second author verified the selected articles against the total number of titles and abstracts. The first author reviewed the articles, extracted the data, and assessed the quality. The second author reviewed the information extracted from the articles and evaluated the quality assessment conducted by the first author. The first author prepared the initial draft of the manuscript, and the second author provided critical comments and edits. Both authors approved the final manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

1. Lipka O, Sarid M, Aharoni Zorach I, et al. Adjustment to higher education: A comparison of students with and without disabilities. *Front Psychol.* 2020; 11: 923.
2. Gregg N. Underserved and unprepared: Postsecondary learning disabilities. *Learn Disabil Res Pract.* 2007; 22: 219–228.
3. Association AP. *DSM 5 Diagnostic and Statistical Manual of Mental Disorders.* 5th ed. Washington, DC: American Psychiatric Association; 2013, p. 947.
4. Cortiella C and Horowitz SH. *The State of Learning Disabilities: Facts, Trends and Emerging Issues.* New York: National Center for Learning Disabilities; 2014.
5. Shaw S. Legal and policy perspectives on transition assessment and documentation. *Career Dev Except Individ.* 2006; 29: 108–113.
6. Scaria LM, Bhaskaran D and George B. Prevalence of specific learning disorders (SLD) among children in India: A systematic review and meta-analysis. *Indian J Psychol Med.* 2023; 45: 213–219.
7. Sparks RL and Lovett BJ. Learning disability documentation in higher education:

What are students submitting? *Learn Disabil Q*. 2014; 37: 54–62.

8. Daley SG and Rappolt-Schlichtmann G. Stigma consciousness among adolescents with learning disabilities: Considering individual experiences of being stereotyped. *Learn Disabil Q*. 2018; 41: 200–212.

9. Gokool-Baurhoo N and Asghar A. I can't tell you what the learning difficulty is": Barriers experienced by college science instructors in teaching and supporting students with learning disabilities. *Teach Teach Educ*. 2019; 79: 17–27.

10. Deacon H, Cook K and Parrila R. Identifying high-functioning dyslexics: Is self-report of early reading problems enough? *Ann Dyslexia*. 2012; 62: 120–134.

11. Bergey BW, Parrila RK and Deacon SH. Understanding the academic motivations of students with a history of reading difficulty: An expectancy-value-cost approach. *Learn Individ Differ*. 2018; 67: 41–52.

12. Sharfi K and Rosenblum S. Activity and participation characteristics of adults with learning disabilities—A systematic review. *PloS One*. 2014; 9: e106657.

13. Pino M and Mortari L. The inclusion of students with dyslexia in higher education: A systematic review using narrative synthesis. *Dyslexia*. 2014; 20: 346–369.

14. Arksey H and O'Malley L. Scoping studies: Towards a methodological framework. *Int J Soc Res Methodol*. 2005; 8: 19–32.

15. Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Ann Intern Med*. 2018; 169: 467–473.

16. Moola S, Munn Z, Tufanaru C, et al. Chapter 7: Systematic reviews of etiology and risk. In: Aromataris E and Munn Z (eds) *JBI Manual for Evidence Synthesis*. JBI; 2020. https://doi.org/10.46658/JBIMES-20-08

17. Lockwood C, Munn Z and Porritt K. Qualitative research synthesis: Methodological guidance for systematic reviewers utilizing meta-aggregation. *JBI Evid Implement*. 2015; 13: 179–187.

18. Aromataris E, Fernandez R, Godfrey CM, et al. Summarizing systematic reviews: Methodological development, conduct and reporting of an umbrella review approach. *JBI Evid Implement*. 2015; 13: 132–140.

19. Callens M, Tops W and Brysbaert M. Cognitive profile of students who enter higher education with an indication of dyslexia. *PLoS One*. 2012; 7: e38081.

20. Callens M, Tops W, Stevens M, et al. An exploratory factor analysis of the cognitive functioning of first-year bachelor students with dyslexia. *Ann Dyslexia*. 2014; 64: 91–119.

21. Shany M, Wiener J and Assido M. Friendship predictors of global self-worth and domain-specific self-concepts in university students with and without learning disability. *J Learn Disabil*. 2013; 46: 444–452.

22. Jordan JA, McGladdery G and Dyer K. Dyslexia in higher education: Implications for maths anxiety, statistics anxiety and psychological well-being. *Dyslexia*. 2014; 20: 225–240.

23. Matteucci MC and Soncini A. Self-efficacy and psychological well-being in a sample of Italian university students with and without specific learning disorder. *Res Dev Disabil*. 2021; 110: 103858.

24. Wang LC and Chung KKH. Do Taiwanese undergraduate students with SLD use different learning strategies than students without these disabilities? *Learn Disabil Res Pract*. 2022; 37: 6–17.

25. Bønnerup KH, Pedersen AL, Weed E, et al. Differences in the literacy skills of Danish dyslexic students in two types of higher education programmes. *Dyslexia*. 2019; 25: 173–189.

26. Pedersen HF, Fusaroli R, Lauridsen LL, et al. Reading processes of university students with dyslexia—An examination of the relationship between oral reading and reading comprehension. *Dyslexia*. 2016; 22: 305–321.

27. Tal-Saban M and Weintraub N. Motor functions of higher education students with dysgraphia. *Res Dev Disabil*. 2019; 94: 103479.

28. Tops W, Callens M, Desoete A, et al. Metacognition for spelling in higher education students with dyslexia: Is there evidence for the dual burden hypothesis? *PLoS One*. 2014; 9: e106550.

29. Hen M. Academic procrastination and feelings toward procrastination in LD and non-LD students: Preliminary insights for future intervention. *J Prev Interv Community*. 2018; 46: 199–212.

30. Sarid M, Meltzer Y and Raveh M. Academic achievements of college graduates with learning disabilities vis-a-vis admission criteria and academic support. *J Learn Disabil*. 2020; 53: 60–74.

31. Cavalli E, Casalis S, Ahmadi AE, et al. Vocabulary skills are well developed in university students with dyslexia: Evidence from multiple case studies. *Res Dev Disabil*. 2016; 51–52: 89–102.

32. Weis R, Erickson CP and Till CH. When average is not good enough: Students with learning disabilities at selective, private colleges. *J Learn Disabil*. 2017; 50: 684–700.

33. Weis R, Dean EL and Osborne KJ. Accommodation decision making for postsecondary students with learning disabilities: Individually tailored or one size fits all? *J Learn Disabil*. 2016; 49: 484–498.

34. McGregor KK, Langenfeld N, Van Horne S, et al. The university experiences of students with learning disabilities. *Learn Disabil Res Pract*. 2016; 31: 90–102.

35. Hollins N and Foley A. The experiences of students with learning disabilities in a higher education virtual campus. *Educ Technol Res Dev* 2013; 61: 607–624.

36. MacCullagh L, Bosanquet A and Badcock NA. University students with dyslexia: A qualitative exploratory study of learning practices, challenges and strategies. *Dyslexia*. 2017; 23: 3–23.

37. Abed MG and Shackelford TK. Educational support for Saudi students with learning disabilities in higher education. *Learn Disabil Res Pract*. 2020; 35: 36–44.

38. Lambert DC and Dryer R. Quality of life of higher education students with learning disability studying online. *Int J Disabil Dev Educ*. 2018; 65: 393–407.

39. Olofsson Å, Taube K and Ahl A. Academic achievement of university students with dyslexia. *Dyslexia*. 2015; 21: 338–349.

40. Zeng W, Ju S and Hord C. A literature review of academic interventions for college students with learning disabilities. *Learn Disabil Q*. 2018; 41: 159–169.

41. Carter C and Sellman E. A view of dyslexia in context: implications for understanding differences in essay writing experience amongst higher education students identified as dyslexic. *Dyslexia*. 2013; 19: 149–164.

42. Evans W. 'I am not a dyslexic person I'm a person with dyslexia': identity constructions of dyslexia among students in nurse education. *J Adv Nurs*. 2014; 70: 360–372.

43. Russak S and Hellwing AD. University graduates with learning disabilities define success and the factors that promote it. *Int J Disabil Dev Educ*. 2019; 66: 409–423.

44. DaDeppo LM. Integration factors related to the academic success and intent to persist of college students with learning disabilities. *Learn Disabil Res Pract*. 2009; 24: 122–131.

45. York TT, Gibson C and Rankin S. Defining and measuring academic success. *Pract Assess Res Eval*. 2015; 20: 5.

46. Carroll JM and Iles JE. An assessment of anxiety levels in dyslexic students in higher education. *Br J Educ Psychol*. 2006; 76: 651–662.

47. Denhart H. Deconstructing barriers: Perceptions of students labeled with learning disabilities in higher education. *J Learn Disabil*. 2008; 41: 483–497.

48. Heiman T and Precel K. Students with learning disabilities in higher education: Academic strategies profile. *J Learn Disabil.* 2003; 36: 248–258.

49. Dekker R, Dekker P and Mulder J. *Kaufman Adolescent and Adult Intelligence Test–Nederlandstalige Versie: Handleiding.* Leiden: Pits Test Publishers; 2004.

50. De Pessemier P and Andries C. *Gl&Schr. Test voor gevorderd Lezen en Schrijven.* Antwerpen: Garant Uitgevers; 2009. https://www.bol.com/nl/nl/p/gl-schr/1001004006870721/

51. Baeyens D, Aerts A, Janssens V, et al. Diagnostics of dyslexia in young adults: a validation study of the Interactive Dyslexia Test Amsterdam–Antwerp (IDAA). In: *European Conference on Psychological Assessment,* University of Ghent, Belgium, 16 September–19 September 2009.

52. Bekebrede J, Van der Leij A, Plakas A, et al. Interactieve Dyslexie Test. Experimentele versie. Uithoorn: Muiswerk Educatief; 2006.

53. Sprenger-Charolles L, Colé P, Béchennec D, et al. French normative data on reading and related skills from EVALEC, a new computerized battery of tests (end Grade 1, Grade 2, Grade 3, and Grade 4)1. *Eur Rev Appl Psychol.* 2005; 55: 157–186.

54. Dunn L, Thèriault-Whalen C and Dunn L. *Echelle de Vocabulaire en Images Peabody.* Richmond Hill, ON: Psycan; 1993.

55. Lefly DL and Pennington BF. Reliability and validity of the adult reading history questionnaire. *J Learn Disabil.* 2000; 33: 286–296.

56. Weintraub N, Israeli-Ovadia A, Shoval H, & Traub-Bar-Ilan R. *The handwriting performance of post-secondary students evaluation (HaPPS).* Jerusalem, Israel: The School of Occupational Therapy of Hadassah and the Hebrew University; 2012.

57. Kessler RC, Adler L, Ames M, et al. The World Health Organization Adult ADHD Self-Report Scale (ASRS): A short screening scale for use in the general population. *Psychol Med.* 2005; 35: 245–256.

58. Berninger VW and Rutberg J. Relationship of finger function to beginning writing: Application to diagnosis of writing disabilities. *Dev Med Child Neurol.* 1992; 34: 198–215.

59. Tiffin J. Instructions and normative data for model 32020 Purdue Pegboard. *Chicago: Science Research Associates*; 1960.

60. Meyers JE and Meyers KR. *Rey Complex Figure Test and Recognition Trial (RCFT).* Odessa, FL: Psychological Assessment Resources; 1995.

61. Saban MT, Ornoy A, Grotto I, et al. Adolescents and adults coordination questionnaire: Development and psychometric properties. *Am J Occup Ther.* 2012; 66: 406–413.

62. Brus B and Voeten M. Een-minuut-test vorm A en B, schoolvorderingstest voor de technische leesvaardigheid bestemd voor groep 4 tot en met 8 van het basisonderwijs. Verantwoording en handleiding. Lisse: Swets & Zeitlinger; 1991.

63. Van den Bos K, Iutje Spelberg H and Scheepsma A. *De Klepel. Vorm A en B. Een Test voor Leesvaardigheid van Pseudowoorden [The Klepel. Form A and B. A Pseudoword Reading Test].* Nijmegen, the Netherlands: Berkhout; 1999.

64. Neeman J and Harter S. *The Self-Perception Profile for College Students (Manual).* Denver, CO: University of Denver; 1986.

65. Sharabany R. Intimate friendship scale: Conceptual underpinnings, psychometric properties and construct validity. *J Soc Pers Relat* 1994; 11: 449–469.

66. Cruise RJ, Cash RW and Bolton DL. Development and validation of an instrument to measure statistical anxiety. In: *American Statistical Association Proceedings of the Section on Statistical Education.* Washington, DC: American Statistical Association; 1985, pp. 92–97.

67. Suinn RM and Winston EH. The mathematics anxiety rating scale, a brief version: psychometric data. *Psychol Rep.* 2003; 92: 167–173.

68. Carver CS, Scheier MF and Weintraub JK. Assessing coping strategies: A theoretically based approach. *J Pers Soc Psychol.* 1989; 56: 267.

69. Rosenberg M. *Society and the Adolescent Self-Image.* Revised edition. Middletown, CT: Wesleyan University Press; 1989.

70. Meyer T, Miller M, Metzger R, et al. Development and validity of the Penn State Worry Scale. *Behav Res Ther.* 1990; 28: 487–495.

71. Nind M, Wearmouth J, Collins J, et al. A systematic review of pedagogical approaches that can effectively include children with special educational needs in mainstream classrooms with a particular focus on peer group interactive approaches. EPPI-Centre, Social Science Research Unit, Institute of Education, UK; 2004.

72. Oliver S and Peersman G. *Using Research for Effective Health Promotion.* UK: McGraw-Hill Education; 2001.

73. Braun V and Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006; 3: 77–101.

74. Zimet GD, Dahlem NW, Zimet SG, et al. The multidimensional scale of perceived social support. *J Pers Assess.* 1988; 52: 30–41.

75. Robins RW, Hendin HM and Trzesniewski KH. Measuring global self-esteem: Construct validation of a single-item measure and the rosenberg self-esteem scale. *Pers Soc Psychol Bull.* 2001; 27: 151–161.

76. Pastorelli C and Picconi L. *Scala di Autoefficacia Scolastica Percepita. GV Caprara (a cura di), La valutazione dell'autoefficacia.* Trento: Erickson; 2001.

77. Gremigni P and Stewart-Brown S. Measuring mental well-being: Italian validation of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). *G Ital Psicol.* 2011; 2: 485–508.

78. Stroud KC and Reynolds CR. *School Motivation and Learning Strategies Inventory (SMALSI).* Torrance, CA: Western Psychological Services; 2006.

79. Schraw G and Dennison RS. Assessing metacognitive awareness. *Contemp Educ Psychol.* 1994; 19: 460–475.

80. Milgram N and Amir N. Academic procrastination in pre-, early and late adolescence. Report Tel-Aviv University and the College of Judea and Samaria; 1998.

81. Milgram NN, Mey-Tal G and Levison Y. Procrastination, generalized or specific, in college students and their parents. *Pers Individ Dif.* 1998; 25: 297–316.