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Investigating the Relationship Between Dyslexia, Academic Achievement, and Writing Competency Among Female High School Students

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Abstract: Dyslexia is a significant learning disability that often hinders students' academic performance, language acquisition, and writing proficiency. This study aimed to investigate the relationship between dyslexia, academic achievement, and writing competency among female high school students. Utilizing a descriptive-correlational design, the research focused on a statistical population of 210 female second-grade high school students in Qaem Shahr during the 2018–2019 academic year. A sample of 136 students was selected using simple random sampling based on the Krejcie and Morgan table. Data were collected using the Pham and Taylor Academic Achievement Questionnaire (1994), a researcher-made Writing Competency Questionnaire, and the Karami Nouri and Moradi Nama Dyslexia Test (2005). Analysis via Pearson correlation and simple regression revealed a significant negative correlation between dyslexia and both academic achievement ($r=-0.48$, $p=0.001$) and writing competency ($r=-0.53$, $p=0.001$). Regression analysis further indicated that dyslexia significantly predict 23% of the variance in academic achievement and 28% of the variance in writing competency. These findings confirm that dyslexia is a primary factor contributing to diminished academic success and writing difficulties. Consequently, early identification of dyslexia, coupled with the implementation of targeted educational programs and therapeutic interventions, is essential for improving students' academic outcomes and fostering their writing skills.

Keywords: Dyslexia, Academic Achievement, Writing Competency, Learning Disorder

Introduction

The educational system of any society serves as a fundamental environment for the individual, social, and cultural development of students. Academic success is heavily contingent upon students' cognitive abilities, linguistic proficiency, and mastery of learning skills (Baddeley, 2012). Among these, reading and writing are essential tools for learning, and deficiencies in either can significantly compromise a student's academic performance. One specific disorder that has garnered substantial attention from psychologists, educators, and researchers in recent years is dyslexia (Baddeley, 1986). Dyslexia is a specific learning disorder primarily characterized by difficulties in reading, word recognition, text comprehension, and linguistic information processing, which can consequently impair other facets of learning. Students with dyslexia often encounter challenges such as slow reading speed, letter reversal, poor reading comprehension, and difficulties in written expression; these obstacles contribute to decreased performance in both the learning process and academic achievement (Baddeley & Hitch, 1974).

The second stage of secondary education is a critical academic period, as students must cope with a vast volume of educational material while simultaneously acquiring high-level skills in analysis,

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composition, and the articulation of complex concepts (Baniqued et al., 2013). At this stage, deficiencies in reading and writing skills can have profound negative impacts on students' academic performance, self-confidence, and academic motivation (Bardach & Murayama, 2025). Furthermore, writing competency is a key indicator of academic success in this phase, given that a significant portion of academic assessment is based on descriptive responses, essays, report writing, and the production of written content. Consequently, any impairment in linguistic processing or reading can directly or indirectly influence the quality of a student's writing (Bartolome et al., 2012).

Given their specific developmental, emotional, and social needs, female secondary students are particularly reliant on academic success and the acquisition of strong communication and writing skills. Writing ability is not only instrumental in academic achievement but also plays a vital role in the formation of personal identity, emotional expression, social engagement, and preparation for future academic and professional pursuits (Beck, 1976). Nevertheless, the presence of dyslexia may lead to reduced writing quality, difficulties in organizing thoughts, persistent spelling errors, and an inability to accurately convey concepts. Such challenges may gradually lead to diminished academic self-confidence, educational anxiety, and even a loss of motivation for learning (Benassi et al., 2010).

While significant research has been conducted on learning disorders and dyslexia in recent years, a considerable portion of these studies has been concentrated on younger cohorts, with fewer investigations addressing the consequences of this disorder specifically among female secondary school students. Furthermore, the simultaneous relationship between dyslexia, academic achievement, and writing competency has been under-researched. A precise understanding of how dyslexia impact academic performance and writing skills is essential for designing effective educational programs, therapeutic interventions, and support strategies for this group of students. Moreover, many students with dyslexia are mislabeled as "low-effort" or "weak" due to their condition remaining undiagnosed, which can lead to adverse psychological and educational outcomes. The failure to identify this disorder in a timely manner and the absence of tailored educational programs may perpetuate academic underachievement and poor writing proficiency. Therefore, investigating the scientific relationship between dyslexia, academic achievement, and writing competency is of paramount importance. The present study aims to examine the relationship between dyslexia, academic achievement, and writing competency among female secondary students to provide a clear perspective on the impact of this disorder across various dimensions of academic and writing performance. The findings of this research may serve as a practical resource for teachers, counselors, educational planners, and parents in identifying learning difficulties, developing appropriate instructional strategies, and enhancing the quality of learning and writing among students.

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Material and Methods

The present study is a fundamental investigation, applied in its objective and correlational in terms of methodology. The statistical population consisted of all female second-grade high school students (specifically the third year of the experimental science track) in the city of Qaemshahr during the 2018–2019 academic year. According to the statistics provided by the Qaemshahr Department of Education, the total population comprised 210 students. A sample of 136 students was selected using simple random sampling, based on the Krejcie and Morgan table. The research utilized three primary instruments for data collection.

Academic Achievement Questionnaire: The Academic Achievement Questionnaire, developed by Pham and Taylor (1994), is a widely recognized tool designed to assess the academic performance status of students. Its primary objective is to evaluate the psychological and behavioral factors influencing academic success. The instrument is grounded in the premise that academic achievement is not solely dependent on intelligence and cognitive ability, but also on factors such as motivation, self-efficacy, planning, behavioral control, and emotional status. The questionnaire consists of 48 items measured on a five-point Likert scale (ranging from “None” to “Very Much”). Higher scores indicate a higher level of academic achievement and the presence of positive educational and psychological traits. The instrument evaluates five main dimensions: self-efficacy, emotional effects, planning, lack of control, and motivation, each reflecting a critical aspect of an individual’s academic performance.

Writing Competency Questionnaire: To assess writing competency, a researcher-made questionnaire was employed. This instrument was developed based on theoretical foundations, existing research literature, and the specific objectives of the study. The questionnaire aims to evaluate various dimensions of writing proficiency, including organization of material, adherence to writing principles, text coherence and cohesion, idea articulation, creativity in writing, grammatical accuracy, and vocabulary usage. The instrument comprises 32 items. The content validity was established by submitting the items to a panel of experts in Persian literature, educational management, and language teaching, with necessary revisions made based on their feedback. To assess reliability, a pilot study was conducted with a sample similar to the research population, and the Cronbach’s alpha coefficient indicated favorable reliability. Responses are measured on a five-point Likert scale (ranging from “Strongly Disagree” to “Strongly Agree”), with higher scores indicating a higher level of writing competency.

Nama Dyslexia Test: This test was standardized by Karami Nouri and Moradi (2005) to assess dyslexia in male and female students from the first to the fifth grade. The total alpha coefficient for this test in the original study was 0.82. The test battery consists of 10 subtests:

Word Reading: Three lists of 40 words each (one point per correct reading).

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Word Chain: The number of words correctly separated from a chain (one point per word).

Rhyme Test: Identification of rhyming words (one point per correct identification).

Picture Naming: Correct naming of images (one point per correct naming).

Reading Comprehension: Responding to questions based on provided texts (one point per correct answer).

Word Comprehension: Explaining the meaning of given words (one point per correct answer).

Phoneme Deletion: Deletion of specific sounds from words.

Non-word Reading: Correct reading of provided nonsense words.

Letter Sign Recognition: Recognition and articulation of letter signs.

Category Sign Recognition: Recognition of signs associated with specific categories.

The subtest scores are analyzed individually to derive a total test score, which determines the student's status regarding dyslexia. The total score assists clinicians in diagnosing the severity of the disorder and designing appropriate therapeutic interventions. A cutoff point for each subtest is set at 70% of the total score; students scoring below this threshold are identified as dyslexic. Moradi, Karami et al. (2016) reported Cronbach's alpha coefficients for the subtests ranging from 0.48 (reading comprehension) to 0.98 (high-frequency words).

Data Analysis

To analyze the data, structural equation modeling (SEM) was used to investigate the relationships between the variables. All data processing and analysis were performed using SPSS (version 20) and structural equation modeling software.

Results

Table 1 presents the descriptive statistics for the research variables, including academic achievement, the researcher-made writing competency questionnaire, and the Nama Dyslexia Test among the secondary school students. Based on the findings in Table 1, the mean score for dyslexia was 62.44 (SD=6.83SD = 6.83SD=6.83), indicating a relatively significant level of reading and writing processing difficulties among some of the students studied. Among the components of academic achievement, motivation yielded the highest mean (M=29.14M = 29.14M=29.14), suggesting that despite certain learning difficulties, students maintained a relatively favorable level of motivation for academic success. Furthermore, the mean score for self-efficacy was 41.27, reflecting a moderate level of belief in their academic capabilities. The planning component was reported at 25.88, indicating a moderate ability in time management, study organization, and structural academic activities. Conversely, the "lack of control" component (M=23.91M = 23.91M=23.91) suggests that some students attribute their academic

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success or failure to external factors, feeling less personal control over their academic outcomes. The total mean score for academic achievement was 130.69, and the mean for writing competency was 66.25. These results indicate that the students studied performed at a moderate level in both academic achievement and writing skills. Given the relatively high mean of dyslexia and the moderate levels of academic achievement and writing competency, it can be inferred that dyslexia-related challenges may negatively impact the quality of students' academic performance and writing proficiency.

Table 1. Descriptive Statistics for Research Variables

Variables	Mean	Standard Deviation
Nama Dyslexia	62.44	6.83
Self-Efficacy	27.41	5.12
Emotional Effects	24.35	4.74
Planning	25.88	4.96
Lack of Control	23.91	4.27
Motivation	29.14	5.43
Total Academic Achievement	130.69	16.58
Writing Competency	66.25	8.37

The results in Table 2 demonstrate a significant negative relationship between dyslexia and academic achievement (P<0.01P < 0.01P<0.01). This finding suggests that as the severity of dyslexia increases, the level of academic achievement decreases. In other words, difficulties related to reading, vocabulary comprehension, and writing processing can impair students' academic performance, leading to declines in learning and educational success. A significant negative relationship was also observed between dyslexia and writing competency. The correlation coefficient indicates that higher levels of dyslexia are associated with diminished writing skills, highlighting the direct impact of reading difficulties on the quality of student writing, text organization, adherence to writing principles, and written expression.

Table 2. Pearson Correlation Between Dyslexia, Academic Achievement, and Writing Competency

Variables	Pearson Correlation (r)	Significance Level (p)
Dyslexia and Academic Achievement	-0.48	0.001
Dyslexia and Writing Competency	-0.53	0.001

The results of the regression analysis in Table 3 indicate that dyslexia serves as a predictor for academic achievement. The negative beta coefficient confirms that dyslexia has a deleterious effect on academic achievement, meaning that increased dyslexic difficulties lead to reduced academic success. Additionally, the coefficient of determination (R2R^2R2) shows that approximately 23% of the variance in academic achievement is explained by the dyslexia variable. Furthermore, the regression results demonstrate that dyslexia plays a significant role in predicting writing competency. The negative beta coefficient signifies that increased difficulties in reading and linguistic processing lead to a decrease in students' writing ability. The coefficient of determination indicates that 28% of the variance in writing

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competency is explained by dyslexia, underscoring the significant impact of this variable on students' writing skills.

Table 3. Simple Regression for Predicting Academic Achievement and Writing Competency based on Dyslexia

Predictor Path	Predictor Variable	Beta (beta)	T-value	Sig.	R^2
Academic Achievement	Dyslexia	-0.48	-5.92	0.001	0.23
Writing Competency	Dyslexia	-0.53	-6.41	0.001	0.28

Discussion

The results of the present study indicate a significant negative relationship between dyslexia and the academic achievement of female secondary students; specifically, higher levels of dyslexia-related difficulties are associated with lower levels of academic achievement. This finding is consistent with the nature of dyslexia as a learning disorder that impairs an individual's ability to read, comprehend text, process information at speed, and decode vocabulary, all of which hinder the student's progress across various subjects (Benzing, 2018). During the second stage of secondary education, where the volume of educational material increases and learning is heavily reliant on reading, analysis, and text comprehension, students with dyslexia face substantial challenges in completing assignments, studying, and performing on examinations, ultimately leading to academic underachievement.

Furthermore, dyslexia are not solely a reading impairment; it also affects a student's cognitive and emotional dimensions (Bergera & Cassutob, 2014). Students who consistently experience failure in reading and learning progressively develop feelings of inadequacy, academic anxiety, and diminished self-confidence. These negative emotional states diminish motivation to study and participate in classroom activities, thereby further weakening academic performance (Bergey et al., 2017). Frequent failure can also cultivate a negative attitude toward the school environment, deterring the student from sustained effort. The mechanism through which dyslexia influences academic achievement can also be explained via information processing theory. Students with dyslexia often exhibit deficits in working memory, processing speed, and sustained attention, resulting in poorer performance in receiving, storing, and retrieving educational information. Consequently, these students require more time to master new concepts and expend significantly more mental energy on academic tasks compared to their peers (Blomert, 2005). This chronic cognitive load leads to mental fatigue, reduced concentration, and, eventually, lower academic efficiency. Moreover, educational systems and traditional teaching methods are often not designed to accommodate the needs of students with dyslexia. An overemphasis on traditional instruction, high-paced teaching, and evaluation methods strictly rooted in reading and writing creates an environment where these students lack the opportunity to compensate for their

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weaknesses. Thus, a lack of appropriate educational support exacerbates their academic difficulties (Blomlie, 1996).

The findings also demonstrate a significant negative relationship between dyslexia and writing competency among female secondary students; increased severity of dyslexia is associated with decreased writing and written expression abilities. This is explained by the fact that dyslexia affect linguistic, cognitive, and writing processes beyond mere reading. Writing is a complex skill requiring the integration of reading, vocabulary comprehension, memory, mental organization, and the ability to articulate thoughts in writing; any disturbance in these processes impairs writing quality (Boada et al., 2012). Students with dyslexia often struggle with phonological processing, vocabulary encoding, and understanding linguistic structure, which leads to weaknesses in spelling, grammar, sentence construction, and text coherence. These students typically require more time to write and, due to persistent spelling and structural errors, demonstrate reduced capacity to produce fluent, cohesive text. In the secondary stage, where analytical, descriptive, and argumentative writing become paramount, these difficulties become more pronounced and negatively affect educational performance (Bogon et al., 2014).

From a cognitive perspective, writing requires efficient working memory, sustained attention, and rapid information processing. Due to deficits in these areas, students with dyslexia face greater cognitive load when converting thoughts into written sentences. A significant portion of their mental capacity is consumed by the effort to recall correct word forms and orthography, leaving less cognitive energy for ideation, creativity, and text organization. This results in writing that is often fragmented, brief, and characterized by more linguistic errors (Boot et al., 2016). Emotional challenges stemming from dyslexia also undermine writing competency. The experience of repeated failures in writing tasks, negative feedback, and social comparison induces anxiety, lowers self-esteem, and leads to writing avoidance. These factors reduce student engagement in writing activities, further limiting the development of their skills. Furthermore, some students avoid using complex vocabulary or expanding on ideas to minimize the risk of making errors, which inadvertently lowers their writing quality (Bosse et al., 2007). Traditional educational methods that prioritize writing speed, spelling accuracy, and written evaluation place undue pressure on dyslexic students. Without remedial instruction, targeted writing exercises, and teacher support, these difficulties persist and intensify (Briscoe & Rankin, 2009). Therefore, it can be concluded that dyslexia reduce writing competency in female secondary students by impairing linguistic and cognitive processes, eroding self-confidence, and restricting participation in written expression, which highlights the urgent need for specialized educational and rehabilitative interventions.

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Conclusion

In summary, the findings suggest that dyslexia, as a specific learning disorder, exerts a significant negative impact on various dimensions of academic performance among female secondary students, leading to decreased academic achievement and weakened writing competency. Difficulties related to reading, information processing, working memory, and linguistic skills complicate the processes of learning and written expression. Furthermore, emotional consequences such as anxiety, diminished self-esteem, and loss of academic motivation exacerbate these challenges. Consequently, the early identification of students with dyslexia, the provision of remedial instruction, the implementation of teaching methods tailored to their specific needs, and the integration of psychological and educational support play a critical role in mitigating the negative consequences of this disorder and enhancing students' academic and writing performance.

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