

# Relationship between dyslexia awareness and stigma among nursing students in Saudi Arabia: A cross-sectional study

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## Abstract

**Background:** Dyslexia—a learning disorder characterized by difficulty in word-level reading skills—can negatively impact nursing students' practice, which can, in turn, affect patient safety. Individuals with dyslexia are often stigmatized. There is a need to explore dyslexia awareness among nursing students and its relationship with stigma in Saudi Arabia.

**Objective:** This study aimed to assess the dyslexia awareness levels among nursing students and its relation to stigma.

**Methods:** A quantitative cross-sectional study was conducted on 154 nursing students at King Abdulaziz University, Saudi Arabia. Data were collected by asking the students to virtually complete the Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS) and the Consciousness Questionnaire-Learning Disabilities (SCQ-LD) from February to March 2021. Data were analyzed using chi-square tests to test significance and Cramer's V to determine the strength of the relationships among the categorical variables.

**Results:** The overall dyslexia awareness level was moderate. Most participants believed that people had negative assumptions about individuals with dyslexia and that they judged and treated them differently. A moderately strong positive association was revealed between knowledge of the stigma surrounding dyslexia and knowledge of dyslexia itself ( $p < 0.001$ ).

**Conclusions:** Increased dyslexia awareness is correlated with greater anticipation that dyslexic individuals will be stigmatized. Therefore, dyslexia awareness should be raised among nursing students. Students or nurses with dyslexia should also be encouraged to learn appropriate coping strategies to ensure patient safety.

## Keywords

dyslexia; learning difficulty; stigma; nurses; nursing students; Saudi Arabia

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## Background

Dyslexia is a learning disability that affects up to 10% of the global population (Ali et al., 2020). It is sometimes misdiagnosed as a visual-perceptual disorder, although it is a language-based reading impairment. Thus, parents and teachers may believe that dyslexia is a visual-perceptual deficit, leading to treatments and accommodations that are not supported by research, which can delay the child's development (Peltier et al., 2020). In truth, dyslexia is a learning disorder characterized by difficulty in word-level reading skills despite appropriate effort and opportunity. Notably, dyslexia is not caused by deafness, blindness, or an intellectual disability (Grimes et al., 2020). Dyslexia has two distinct features: 1) it may differ according to age, education, and intelligence, and 2) it might impact an individual's accomplishment of daily activities (Ramli et al., 2019). It is a chronic disorder with varying clinical manifestations, depending on the individual's job demands and available assistance, as well as the breadth and severity of their talents

and challenges (Handler, 2016). Nevertheless, difficulties with reading in childhood may persist through adolescence and into adulthood (Lopez-Escribano et al., 2018). Although the literature on dyslexia is abundant, this disability is rarely recognized at the individual, familial, or societal levels (Livingston et al., 2018).

Increasing awareness of dyslexia in the student population may allow for a better overall diagnosis of dyslexia. When students were asked to define dyslexia, their knowledge about it was ascertained to be minimal (Ewain et al., 2017). This lack of dyslexia awareness can have detrimental consequences for people with dyslexia, including misunderstandings and mental stress; along these lines, it can also negatively impact their learning processes and, consequently, their practice (Ewain et al., 2017). Although approximately 31.4% of primary school students in Saudi Arabia have dyslexia (Subramaniyan et al., 2020), no studies have yet assessed the levels of dyslexia awareness among Saudi nursing students.

Furthermore, limited research has explored the incidence of dyslexia in nursing students and registered nurses in the

United States and Britain. For instance, a recent study investigated the effects of dyslexia on the clinical practice of 12 nursing students and examined their coping mechanisms. It revealed that nursing students with dyslexia had specific learning difficulties, which might have been affecting the quality and safety of their practice (Crouch, 2019). Nursing students with dyslexia reported several challenges during their practice involving documentation, difficulty in reading, slowness, and difficulty in medication administration (Crouch, 2019). Another study that explored the experiences of 14 registered nurses with dyslexia in Great Britain noted that they reported being easily distracted and tired, taking longer to complete their tasks, and facing difficulties in documentation and drug administration (Major & Tetley, 2019). Therefore, it is essential to promote disclosures of learning disabilities among students and nurses to achieve patient safety (Major & Tetley, 2019). In addition, the results of a study conducted on nursing students showed that participants had useful strategies to cope with the impact of dyslexia on clinical practice, such as memory joggers, organizing and documentation strategies, and poster guidelines (Grimes et al., 2020). Thus, dyslexia awareness might support the early detection of the disability, which may be beneficial in the therapeutic process.

Stigma is the impression of being stereotyped and negatively discriminated against by the public (Stoeber & Rountree, 2021). Developing methods to reduce negative public beliefs about dyslexia and replacing them with scientifically supported knowledge is crucial to counter discrimination (Peltier et al., 2020). Many students do not disclose their learning disabilities to their peers and teachers owing to a lack of awareness about their disability and fear of being treated differently (Grimes et al., 2020). Individuals with learning disabilities have reported embarrassment, isolation, and insecurity, and it has been reported that the memories of such events can have long-term consequences in adulthood (Livingston et al., 2018). Adolescents with dyslexia are twice as likely to experience emotional distress, including a higher risk of aggression and suicidal thoughts (Livingston et al., 2018). A study on 14 practicing nurses with dyslexia reported that they had been stigmatized and received negative comments from their colleagues and staff (Trunk et al., 2020). Moreover, a study on 123 medical students showed that half the students had witnessed negative comments, either in public or in private, about people with dyslexia (Hennessy et al., 2020). Along these lines, previous studies have conclusively indicated that individuals with dyslexia are stigmatized (Trunk et al., 2020) (Mather et al., 2020; Trunk et al., 2020). Stigmatization and lack of dyslexia awareness can lead to a lack of support (Major & Tetley, 2019) and negative psychological effects (Hennessy et al., 2020). However, most of these studies were qualitative and exploratory in nature (L'Ecuyer, 2019); thus, triangulating qualitative and quantitative studies is essential to support and improve the body of knowledge regarding dyslexia and stigma among nursing students. The current study addressed the need to explore dyslexia awareness among nursing students and its relationship with stigma in Saudi Arabia. The study was based on the hypothesis that increased dyslexia awareness is correlated with anticipating the stigmatization of dyslexic individuals, which fosters the desire to combat stigma.

Specifically, the study aimed to establish the relationship between increasing dyslexia awareness and decreasing the stigma associated with dyslexia through empirical evidence. Focusing on creating dyslexia awareness may improve the rate of early detection, thus aiding individuals with dyslexia who may face challenges in their nursing practice. Meanwhile, if stigma does decrease with increasing awareness, the number of nursing students or nurses disclosing their illnesses will increase. This would, in turn, allow the students to improve their practice by adopting coping techniques to deal with challenges, ultimately benefiting patients by enhancing the level of care they receive.

The research questions were as follows: 1) What is the level of dyslexia awareness among nursing students at King Abdulaziz University (KAU)? 2) What is the relationship between dyslexia awareness and stigma?

## Methods

### Study Design

This was an exploratory study. Considering the lack of information about the research topic, a cross-sectional design using quantitative descriptive data and analyzing correlations was implemented. The purpose of a descriptive study is to systematically and accurately define a condition, population, or phenomenon (Polit & Beck, 2018). Correlation analysis explores relationships between focal variables without the researcher being involved or implementing them (Polit & Beck, 2018). Finally, cross-sectional research collects information at one stage and infers shifts over time as data are collected from multiple age or developmental groups (Polit & Beck, 2018).

### Samples/Participants

The participants were nursing students from the KAU Faculty of Nursing. The inclusion criteria were: a) male and female nursing students from any level of baccalaureate and master's programs, and b) students capable of speaking and reading English. Due to time constraints, the exclusion criterion was nursing students not from KAU. Given that there are no studies on the relationship between dyslexia and stigma, a medium effect size of 0.3 was estimated for correlations with two-tailed tests. Therefore, the sample size required for correlation was 84. A sensitivity analysis was conducted within G-Power 3.0.10 for a chi-square test, which determined that a sample of 154 participants would be able to minimally detect an effect size ( $f$ ) of 0.31 (Faul et al., 2007). Therefore, the sample size was sufficient to detect the significance at a 95% confidence interval, with a medium effect size of 0.3 and a power of 0.8 calculated by G\*Power 3.1 (Faul et al., 2007).

### Instruments

Demographic data such as age, sex, level of education (bachelor's or master's degree), level of education in the nursing program (second-, third-, or fourth-year nursing students), and marital status were collected. In addition, two instruments were used: 1) the awareness scale, which measures the accuracy of the general knowledge of dyslexia, and 2) the stigma scale, which measures the consciousness of the participants about the stigma surrounding people with learning disabilities, such as dyslexia, regardless of whether the participants themselves have dyslexia or not.

The first instrument was the Knowledge and Beliefs about Developmental Dyslexia Scale (KBDDS) developed by Soriano-Ferrer and Echegaray-Bengoa (2014). The KBDDS was developed to measure general information about knowledge and misconceptions about dyslexia. The scale includes three specific areas related to dyslexia: 1) its nature, causes, and outcomes; 2) its symptoms and diagnosis; and 3) its treatment (Soriano-Ferrer et al., 2016). The instrument consists of a 36-item scale to assess dyslexia awareness levels, rated on a 3-point Likert scale, where 0 = "do not know," 1 = "true," and 2 = "false" (Soriano-Ferrer et al., 2016). This rating makes it possible to differentiate between the students' lack of awareness and incorrect beliefs. The more the participant states the correct responses, the higher the awareness. The items of the instrument were reviewed by 89 teachers, and the instrument's content validity was established. Furthermore, the scale had a Cronbach's alpha of 0.76, indicating its reliability. Permission was obtained from Soriano-Ferrer and Echegaray-Bengoa (2014) to use their KBDDS instrument.

A second instrument was used to assess the anticipated stigma related to dyslexia. The items of the instrument were derived from the Stigma Consciousness Questionnaire-Learning Disabilities (SCQ-LD), which is valid and reliable (Daley & Rappolt-Schlichtmann, 2018). The tool was developed to assess stigma consciousness related to adolescents with learning disabilities. The SCQ-LD had a Cronbach's alpha of 0.76, confirming its reliability (Daley & Rappolt-Schlichtmann, 2018). In addition, external validity was established through a positive association with overall self-consciousness and a negative association with measures of self-perception (Daley & Rappolt-Schlichtmann, 2018). As the SCQ-LD was developed of 12 items to assess the individual experiences of stigma consciousness, the questions used in the study were determined based on which items comprised the anticipated stigma. Thus, only five items that represent the concept of the anticipated stigma were derived, which are as follows: 1) people treat individuals with dyslexia differently, 2) people have negative views about individuals with dyslexia, 3) people judge individuals with dyslexia, 4) people make negative assumptions about individuals with dyslexia, and 5) people believe that there is something abnormal about individuals with dyslexia. The items were rated on a 3-point Likert scale where 0 = "do not know," 1 = "true," and 2 = "false." A higher mean indicated greater levels of stigma. Daley and Rappolt-Schlichtmann (2018) granted the researchers permission to adapt their SCQ-LD instrument.

### Data Collection

This study was conducted at the Faculty of Nursing, Jeddah, KAU, Saudi Arabia. Data were collected virtually from February to March 2021 using Google Forms. Participants were reached via social media platforms, e.g., Facebook, Twitter, and WhatsApp. The questionnaire included questions on demographics, the scale of stigma, and the KBDDS scale.

### Data Analysis

Demographic data and descriptive and inferential statistics were analyzed using the Statistical Package for the Social Sciences (IBM SPSS Statistics 25). Descriptive statistics were used to measure the frequencies of the study variables.

Continuous variables were measured and reported as means and standard deviations. Counts and percentages were used for categorical variables. The chi-square test was used to test significance, and Cramer's V was used to determine the strength of the relationships among the categorical variables. The Cronbach's alpha score for reliability and internal consistency was 0.73 and 0.77 for the KBDDS and SCQ-LD, respectively.

### Ethical Consideration

Ethical approval for conducting the study was obtained from the ethics and research committee of the KAU Faculty of Nursing, which gave ethical approval to conduct the study (Ref No: 2B. 58). Study enrollment was voluntary, and collected data were completely anonymized. Comprehensive information about the study was provided to participants on the first page of the survey, allowing them to decide whether to enroll in the study.

## Results

### Characteristics of Participants

Of the 154 participants enrolled in the study, 92.2% were females, and 7.8% were males. Most participants (66.9%) were aged between 18 and 21 years, and 88.3% were single. The highest percentage (44.2%) of the participants were fourth-year nursing students, while the lowest (10.4%) were master's students (Table 1).

Table 1 Participants' characteristics (N = 154)

Demographics	n	%
<b>Gender</b>		
Female	142	92.2
Male	12	7.8
<b>Age</b>		
18–21	103	66.9
22–25	33	21.4
26–30	8	5.2
> 30	10	6.5
<b>Marital status</b>		
Single	136	88.3
Married	17	11.0
Separated	1	0.6
<b>Educational level in the nursing program</b>		
2 <sup>nd</sup> year	47	30.5
3 <sup>rd</sup> year	23	14.9
4 <sup>th</sup> year	68	44.2
Master's degree	16	10.4

Out of the participants, 150 (97.4%) noted that they had never been diagnosed with dyslexia, and 123 (79.9%) indicated that they did not know any family members, friends, colleagues, community staff, or anyone in general who had dyslexia.

### Dyslexia Awareness Level

Each statement in the KBDDS scale had two options, "true" or "false," which revealed the participants' awareness of dyslexia. Participants responded correctly to 18 (50%) of 36 statements on average. In contrast, the other half of the statements were new to the participants, as more than 50% of the participants responded "do not know" to them (Table 2).

**Table 2** Descriptive statistics indicating participants' level of dyslexia awareness ( $N = 154$ )

Statement	False		Do Not Know		True		Weighted Mean	Correct Response
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
Dyslexia is the result of a neurological disorder	7	4.5	58	37.7	89	57.8	2.53	TRUE
Dyslexia is caused by visual perception deficits, producing the reversal of letters and words	36	23.4	48	31.2	70	45.5	2.22	FALSE
A child can have dyslexia and be gifted	11	7.1	45	29.2	98	63.6	2.56	TRUE
Children with dyslexia often have emotional and social disabilities	20	13.0	38	24.7	96	62.3	2.49	TRUE
The brains of individuals with dyslexia differ from those without dyslexia	48	31.2	59	38.3	47	30.5	1.99	TRUE
Dyslexia is hereditary	40	26.0	73	47.4	41	26.6	2.01	TRUE
Most studies indicate that about 5% of school-age students have dyslexia	9	5.8	84	54.5	61	39.6	2.34	TRUE
Dyslexia has a greater occurrence in males than in females	15	9.7	86	55.8	53	34.4	2.25	TRUE
Children with dyslexia are more consistently impaired in phonemic awareness (i.e., the ability to hear and manipulate sounds in language) than in any other ability	31	20.1	68	44.2	55	35.7	2.16	TRUE
Modeling fluent reading is often used as a teaching strategy for dyslexic individuals	11	7.1	67	43.5	76	49.4	2.42	TRUE
People with dyslexia have below-average intelligence	84	54.5	46	29.9	24	15.6	1.61	FALSE
The reading of students with dyslexia is often characterized by inaccuracy and lack of fluency	6	3.9	57	37.0	91	59.1	2.55	TRUE
Seeing letters and words backward is a basic characteristic of dyslexia	16	10.4	68	44.2	70	45.5	2.35	FALSE
Difficulty with the phonological processing of information is one of the most important deficits in dyslexia	13	8.4	71	46.1	70	45.5	2.37	TRUE
Intelligence tests are useful in identifying dyslexia	36	23.4	69	44.8	49	31.8	2.08	TRUE
All poor readers have dyslexia	10	67.5	36	23.4	14	9.1	1.42	FALSE
Children with dyslexia can be helped by using colored lenses/colored overlays	24	15.6	79	51.3	51	33.1	2.18	FALSE
Physicians can prescribe medications to help students with dyslexia	33	21.4	82	53.2	39	25.3	2.04	FALSE
Multisensory instruction is not an effective training method at the moment	40	26.0	78	50.6	36	23.4	1.97	FALSE
Students who have reading disabilities without an apparent cause are said to have dyslexia	36	23.4	73	47.4	45	29.2	2.06	TRUE
People with dyslexia are not stupid or lazy; Knowing about the term helps children	16	10.4	33	21.4	105	68.2	2.58	TRUE
Providing students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, etc., is unfair to other students	74	48.1	45	29.2	35	22.7	1.75	FALSE
Intervention programs that emphasize the phonological aspects of language with the visual support of letters are effective for students with dyslexia	6	3.9	64	41.6	84	54.5	2.51	TRUE
Most teachers receive intensive training in working with children who have dyslexia	37	24.0	49	31.8	68	44.2	2.20	FALSE
I think dyslexia is a myth, a problem that does not exist	95	61.7	38	24.7	21	13.6	1.52	FALSE
Repeated reading techniques are useful to improve reading fluency	6	3.9	56	36.4	92	59.7	2.56	TRUE
Problems in establishing laterality (body schema) are the cause of dyslexia	26	16.9	100	64.9	28	18.2	2.01	FALSE
Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies	8	5.2	55	35.7	91	59.1	2.54	TRUE
Dyslexia refers to a relatively chronic condition that is often not completely overcome	35	22.7	71	46.1	48	31.2	2.08	TRUE
Many students with dyslexia continue to have reading problems as adults	17	11.0	64	41.6	73	47.4	2.36	TRUE
Many students with dyslexia have low self-esteem	13	8.4	49	31.8	92	59.7	2.51	TRUE
Children with dyslexia have problems with decoding and spelling but not with listening comprehension	22	14.3	48	31.2	84	54.5	2.40	TRUE
Applying an individual reading test is essential to diagnosing dyslexia	12	7.8	45	29.2	97	63.0	2.55	TRUE
Individuals with dyslexia tend to spell words incorrectly	20	13.0	41	26.6	93	60.4	2.47	TRUE
Dyslexia usually lasts for a long time	20	13.0	66	42.9	68	44.2	2.31	TRUE
Dyslexia is characterized by difficulty in learning to read fluently	13	8.4	41	26.6	100	64.9	2.56	TRUE

### Description of Stigma Related to Dyslexia

Nearly 70% of the participants believed that people had negative assumptions about individuals with dyslexia and that people judge and treat such individuals differently (Table 3).

### Relationship between Dyslexia Awareness and Stigma

The chi-square test was conducted between the knowledge level of dyslexia and its associated stigma. The results showed

a statistically significant association between the knowledge level of dyslexia and the stigma associated with it ( $p < 0.001$ ). There was a moderately strong positive association between knowledge of the stigma surrounding dyslexia and knowledge of dyslexia itself ( $p < 0.001$ ). In other words, as the knowledge of dyslexia increases, knowledge of its stigma also increases (Table 4).

**Table 3** Descriptive statistics indicating participants' consciousness about stigma related to dyslexia ( $N = 154$ )

Statement	False		Do Not Know		True		Weighted Mean
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
People treat individuals with dyslexia differently	21	13.6	27	17.5	106	68.8	2.55
People have negative views about individuals with dyslexia	19	12.3	34	22.1	101	65.6	2.53
People judge individuals with dyslexia	20	13.0	27	17.5	107	69.5	2.56
People make negative assumptions about individuals with dyslexia	18	11.7	28	18.2	108	70.1	2.58
People think there is something wrong with individuals with dyslexia	15	9.7	30	19.5	109	70.8	2.61

**Table 4** Correlation between dyslexia and stigma ( $N = 154$ )

	False (%)	Do Not Know (%)	True (%)	Chi <sup>2</sup>	<i>p</i> -value	Cramer's V
Dyslexia scale	62.30	22.10	15.60	72.324	<0.001*	0.485
Stigma scale	17.50	13.00	69.50			

Note: \*significant  $p < 0.05$

## Discussion

This study explored the level of dyslexia awareness among nursing students at KAU and its relation to awareness of the stigma individuals with dyslexia face. The former awareness level was analyzed using the KBDDS. Since the respondents demonstrated an average of 50% correct responses on KBDDS, a moderate level of awareness of dyslexia was assumed. This result is congruent with a study conducted in Malaysia, which showed that 64.4% of the study participants were not fully aware of dyslexia (Subramaniyan et al., 2020). When the KBDDS was applied to teachers, a medium level of dyslexia awareness was observed (Echegaray-Bengoa et al., 2017; Soriano-Ferrer et al., 2016). Such evidence demonstrates a lack of dyslexia awareness at both the student and teacher levels. Most participants in this study noted that they had never been diagnosed with dyslexia and did not know any family members, friends, colleagues, community staff, or anyone among the general population who had dyslexia. However, an earlier study found that many people with dyslexia, particularly students, are ashamed to admit their diagnosis publicly (Grimes et al., 2020). Therefore, among the 97.4% of participants who cited no prior diagnosis of dyslexia, some may have been diagnosed with dyslexia but have chosen to state the opposite in fear of public criticism (Wagner et al., 2020). Further, some might not be aware that the difficulties they face could be diagnosed as dyslexia.

It is important to highlight the main misconceptions that students have about dyslexia. Most students believed that dyslexia entailed the perception of letters and words as reversed, which is incorrect. However, such a misunderstanding of the issue is common and has been demonstrated by the participants in other studies (Washburn et al., 2017; Wery & Diliberto, 2017). Another misconception

among the participants was regarding heredity and dyslexia. More than 40% of the students did not know if dyslexia was hereditary, while 26% gave the wrong answer. Notably, other studies have demonstrated that such misconceptions are highly prevalent, such as one involving preschool teachers, where 54% of the responses were incorrect (Ramli et al., 2019). The majority of the students in our study incorrectly believed that teachers received intensive training in working with individuals with dyslexia; a similar result was also reported in a study conducted in India (Hemadharshini et al., 2020). It is possible that in both studies, the respondents did not understand the situation because they were not involved in it.

Additionally, the majority of the respondents chose the "do not know" option on several occasions. For instance, 55.8% chose "do not know" as a response to the question about the occurrence of the disorder among men and women. Moreover, 51.3% of students did not know about the efficacy of colored lenses as therapy, and 53.2% of the respondents did not know whether there were medications to treat dyslexia. All three findings are consistent with a study conducted on teachers in China (Yin et al., 2020). Since the respondents universally struggled to answer the last two questions concerning dyslexia treatments, it can be assumed that there is a common lack of knowledge about dyslexia treatments. Several respondents also did not answer questions about the problems of establishing laterality as being caused by dyslexia and the efficacy of multisensory instruction as a treatment measure (Echegaray-Bengoa et al., 2017; Soriano-Ferrer et al., 2016). Soriano-Ferrer et al. (2016), who studied dyslexia awareness among Spanish-speaking teachers, reported similar findings. Additionally, the majority of the respondents in this study did not know if dyslexia could be chronic and identified using intelligence tests and if children with dyslexia were impaired in phonemic awareness. However, in other studies, participants were highly likely to choose "yes" and "no" rather than "do not know" as a response to these questions (Echegaray-Bengoa et al., 2017; Soriano-Ferrer et al., 2016).

The second part of the study involved conducting the SCQ-LD analysis to identify awareness about the stigma individuals with dyslexia face. Most respondents believed that people with dyslexia were subject to negative assumptions by others. Almost 70% believed that people behaved negatively and judgmentally toward individuals with dyslexia. No previous studies have examined dyslexia awareness and its

association with awareness of stigma among non-dyslexic nurses; however, one study reported that dyslexic participants had experienced moderate stigma because of their disability (Trunk et al., 2020). Finally, the results revealed a significant relationship between the knowledge levels on the dyslexia and stigma awareness scales. The findings of the study contribute to understanding the perception of dyslexia among nursing students and show that anticipated stigma depends on the level of knowledge of the disorder. This result is consistent with those of several studies (Grimes et al., 2020; Hennessy et al., 2020; Major & Tetley, 2019). Grimes et al. (2020) explored the experiences of disability and the influence of stigma on learning; its results revealed that 28% of participants with dyslexia experienced negative feelings from their peers and being labeled as dumb or slow by their friends and family, which impacted their school performance and self-esteem. These findings highlight that education about dyslexia is needed to reduce negative attitudes and stigma.

### Limitations

This study had limitations in terms of the data collection tool, sampling method, and design. Self-reported questionnaires were used, potentially introducing bias through participants trying to inflate their knowledge or hide their true feelings to seek social acceptance. Another limitation is the use of a convenience sample. Owing to the descriptive nature of the study and the limited time and resources, convenience sampling was concluded to be preferable. Finally, the cross-sectional design used in this study was a limitation as variables were examined at a single time, despite presumed changes over time in the study variables. For example, people can change in response to several factors. Plausibly, too, the cross-sectional approach may have raised the difficulty of detecting associations. Hence, a longitudinal method is required to obtain more accurate data.

### Implications of the Study

Based on the findings, efforts should be made to raise awareness of dyslexia and its possible impact on nursing students' learning experiences and practice. Awareness will decrease the fear of facing the stigma individuals with dyslexia otherwise experience. This can be accomplished by, for example, organizing dyslexia awareness events in universities and public places and creating a trusted media platform to spread information about dyslexia during Dyslexia Awareness Month. Additional research is needed to assess the awareness levels and stigma related to dyslexia on a larger scale to reinforce the findings of this study.

## Conclusion

This study aimed to assess the level of dyslexia awareness and its relation to the level of knowledge about the stigma associated with dyslexia among nursing students in Saudi Arabia. The findings of this study revealed that dyslexia awareness is at a medium level. Moreover, the results contribute to understanding the perception of dyslexia among nursing students and show that the anticipated stigma depends on the level of knowledge of the disorder. When dyslexia awareness is high, nursing students are more attentive to the stigma surrounding those with dyslexia. Thus,

these results highlight the importance of raising dyslexia awareness among nursing students to fight associated stigma and foster an open culture for nurses with dyslexia to help them learn appropriate coping strategies for safer practice. Awareness of dyslexia and its consequences should be promoted in different contexts, such as schools, universities, and social media; notably, this can help individuals with dyslexia adopt strategies to manage their dyslexia and improve society's understanding and acceptance of individuals with dyslexia without judgment. Consequently, individuals with dyslexia may experience less stigma throughout their careers.

### Declaration of Conflicting Interest

The authors declare no conflict of interest.

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### Authors' Contributions

Conceptualization [DH, RS, RA, RB, ZB, and AM]; Methodology [DH, RS, RA, RB, ZB, and AM]; Formal analysis [DH, RS, RA, RB, ZB, and AM]; Investigation [RS, RA, RB, and ZB]; Writing—original draft preparation [DH, RS, RA, RB, ZB, and AM]; Writing—review and editing [DH, RS, RA, RB, ZB, AM, LS, and NA]; Supervision [DH, AM, LS, and NA]; Project administration [LS and NA]. All authors have read and agreed to the published version of the manuscript.

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### Data Availability

Data are available upon reasonable request with the corresponding author.

### Declaration of Use of AI in Scientific Writing

Nothing to disclose.

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