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Assessing the relationship between dyslexia, psychological distress, and academic self-efficacy among Nigerian university undergraduates

Bede C. Akpunne, Oladoyin Idowu, Daniel O. Kumuyi¹, Elizabeth N. Akpunne

Abstract:

BACKGROUND: Academic self-efficacy refers to the student's beliefs and attitudes toward their capabilities to achieve academic success, as well as belief in their ability to fulfil academic tasks and the successful learning of the materials. The influence of dyslexia on academic self-efficacy and psychological distress among Nigerian students is underresearched in this study. This study investigated the relationship between dyslexia, psychological distress, and academic self-efficacy.

MATERIALS AND METHOD: A total of 460 undergraduates purposively drawn from the University of Lagos, Nigeria, of over 10,000 undergraduate population, with a mean age of 26 ± 5 years, responded to the Academic Self-Efficacy Scale, the dyslexia adult checklist, the 12-item General Health Questionnaire, and Adult Reading History Questionnaire. Data were analyzed descriptively, and the regression analysis and *T*-tests were used for statistical analysis, with a significance threshold of $P < 0.05$.

RESULTS: The results showed that dyslexia is a significant predictor of academic self-efficacy ($\beta = 0.34$, $t = 7.31$, $P < 0.01$). Dyslexia strongly predicted performance in examination [$\beta = 0.32$, $F = 48.18$, $P = 0.00$], comprehension [$\beta = 0.32$, $F = 33.54$, $P = 0.00$], school adjustment [$\beta = 0.32$, $F = 35.86$, $P = 0.00$], reading skill [$\beta = 0.21$, $F = 18.65$, $P = 0.00$], working memory [$\beta = 0.26$, $F = 28.5$, $P = 0.00$], and time management [$\beta = 0.21$, $F = 19.8$, $P = 0.00$] among the undergraduates. In addition, dyslexia significantly predicted psychological distress [$t(41) = 1.40$, $P = 0.65$]. Gender had no significant influence on academic self-efficacy and psychological distress among the participants [$t(41) = 1.33$, $P = 0.19$].

CONCLUSION: Dyslexia is a strong predictor of academic self-efficacy and psychological distress. Male and female Nigerian undergraduates have similar academic self-efficacy and psychological distress.

Keywords:

Academic self-efficacy, dyslexia, psychological distress, university undergraduates

Department of Psychology,
Redeemer's University,
Ede Osun State,
Nigeria, ¹Department
of Behavioural Science
and Ethics, St Matthew's
University, West Bay,
Cayman Islands

Address for correspondence:

Dr. Daniel O. Kumuyi,
Department of Behaviour
and Ethics, St Matthew's
University, West Bay,
Cayman Islands.
E-mail: kumuyi6212@run.
edu.ng

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Introduction

Albert Bandura is credited with coining the term "self-efficacy," which refers to a person's subjective evaluation of their own ability to perform a certain task.^[1] Self-efficacy and motivation are tightly associated.^[2,3] Additionally, self-efficacy is a method for understanding and forecasting thoughts,

feelings, and actions as well as organizing and carrying out action plans to accomplish particular goals.^[1] It is less concerned with a person's talents and skills. It takes into account what people believe they can do with their skills and abilities, which is of greater importance. All things considered, self-efficacy plays a self-regulatory role by enabling individuals to exert control over

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their cognitive processes and behaviors, changing their environments.^[4]

Self-efficacy beliefs affect how people feel, think, motivate themselves, and conduct themselves.^[5] Self-efficacy beliefs are the cornerstone of human motivation, well-being, and personal achievement.^[3] This is due to the fact that people lack the motivation to act or to persist in the face of challenges unless they have faith in their ability to bring about the results they deserve. A wealth of empirical data supports Bandura's assertion that self-efficacy beliefs affect almost every aspect of people's lives.^[3,6] Examples include whether people think productively, self-debilitatingly, pessimistically, or optimistically and how well they motivate themselves, their susceptibility to stress and depression, and their life decisions.

According to the self-efficacy idea, an individual's importance and perception of his or her own abilities are key contributors to successful outcomes. According to self-efficacy theory, everyone has the ability to succeed given the chance and the confidence to do so.^[7,8] The self-efficacy hypothesis stresses how people can feel more in charge of their life and empowered, which would make it easier for them to achieve their goals.^[8] The self-efficacy theory refutes the idea that successful people are inherently better than unsuccessful people. According to the self-efficacy hypothesis, those who are now struggling might not have had access to the mastery experiences or role-modelling required to grow highly effective levels of self-efficacy.^[8]

Self-doubt and avoiding circumstances where one fears one would fail are symptoms of low self-efficacy. The amount of effort people put into tasks and the length of time they will persevere in the face of difficulties can both be influenced by self-efficacy. Self-efficacy is a very effective predictor of students' motivation and learning.^[9] It forecasts academic progress and career choices across domains and age groups.^[10] Negative correlations have been shown between self-efficacy and dyslexia.^[11]

Dyslexic students are more likely than the general population to drop out of high school, and they are also less likely to graduate from a four-year college.^[12] Most students with learning disabilities tend to acquire good behavioral or emotional coping mechanisms to make up for their disabilities in order to deal with difficulties or challenges in their schooling. Givon and Court, and also Heiman, and Kariv found that the majority of students with dyslexia utilize harmful coping mechanisms, such as not admitting they have a learning disability and not using accommodations, and they also refuse to receive any kind of exceptional aid from others.^[13,14] Due to stigmatization, students with dyslexia are more prone

to feel emotional instability and inferiority, which leads to a considerably more negative academic self-concept and worse academic and overall self-esteem compared to their peers.^[15-18]

According to additional research, students with learning difficulties are more likely to struggle with relationships, social engagement, and general peer interaction, which lowers their social status. They have little to no social skills if their dyslexia is not well handled.^[19-21] As opposed to receiving special assistance in self-contained special education classes or resource rooms, children with learning disabilities who receive in-class support or take part in inclusive programs are more socially accepted by their peers and feel less lonely.^[22] The aforementioned issues may persist into adulthood, resulting in feelings of inadequacy, uncertainty, and anxiety as well as trouble making and maintaining social connections.^[23] Adults with dyslexia are at risk for having low self-esteem, according to research.^[17] However, an important and growing number of students with learning disabilities are able to continue their education and earn a degree from a university or college with effort and perseverance.^[12]

The signs of psychological distress are common in dyslexic children, adolescents, and adults who experienced difficulties in school.^[24-26] They may be subjected to repeated humiliation by other kids and pressure from parents, teachers, or other caregivers who do not comprehend them, which may be the cause of their issues, frustration, and loneliness in life. These issues may eventually lead to a negative self-concept.^[26] According to earlier research, students with dyslexia employ more defensive self-handicapping techniques.^[27] Dyslexics are more likely to experience feelings of perplexity, anger, negativity, anxiety, hopelessness, and depression.

Reading, writing, math, memory, and organizational issues are just a few of the many difficulties that children with learning disabilities (LD) frequently face.^[26] For many people, intense feelings of annoyance, anger, grief, or embarrassment can result in behavioral problems like substance abuse or juvenile delinquency as well as psychological disorders like anxiety, depression, and low self-esteem. The GreatSchools staff expressed their opinion that despite their efforts, dyslexic youngsters frequently receive little praise. Instead, parents, instructors, and other students regularly criticize and condemn them for their academic difficulties and failures. As a result, rather than feeling proud of their achievements, these kids frequently end up in a muck of frustration and embarrassment.^[26] Even when others offer assistance and motivation, ongoing struggle and failure can lead to the development of a poor self-image. A cycle of failure and negativity is reinforced by low self-esteem and uncertainty, which hinder learning

and academic success.^[26] Over time, such children stop trying and enter a state of learned helplessness and see little or no connection between their efforts and ultimate outcomes.^[28]

Dyslexic students frequently experience stress and failure in school,^[29] feel that academicians do not understand their condition,^[30] and think that they are sluggish.^[31] According to studies, dyslexic university students had more somatic complaints, social issues, worse self-esteem, and higher depression scores than their counterparts.^[32,33] It might be assumed that dyslexic undergraduate students had overcome their negative self-perception. However, dyslexic students still struggle with a variety of academic skills even when they are admitted to universities.^[30] The current study examines how dyslexia affects university undergraduates' academic self-efficacy and psychological distress. It is expected that among Nigerian undergraduates, dyslexia will strongly predict academic self-efficacy and psychological distress. Additionally, participants' reports of academic self-efficacy and psychological distress will differ between men and women.

Materials and Methods

Study design and setting

The design of the study is a cross-sectional survey method. The design enabled the researcher to collect information on the phenomenon of dyslexia on academic self-efficacy and psychological distress to examine them among undergraduate students in different departments. This survey was used to identify and examine the interplay and establish the possible hypothesis that dyslexia could affect academic self-efficacy and psychological distress due to attainment of academic achievement borne out of different students, dependent on the individual. The design also allowed the researcher to discuss the variables interested in the population. The dependent variables considered here are academic self-efficacy and psychological distress, while the independent variable considered is dyslexia with sociodemographic variables

This study focuses on the University of Lagos used only undergraduate students of the institution across the faculties. The faculties comprise Faculty of Sciences, Faculty of Social Sciences, Faculty of Engineering, Faculty of Humanities/Arts, Faculty of Law, Faculty of Medicine, Faculty of Education, Faculty of Management Sciences, and various departments in these faculties.

Study participants and sampling

Only undergraduate students from the University of Lagos' various faculties were employed in this investigation. The faculties include sciences, social sciences, engineering, humanities/arts, law, medicine,

education, and management sciences, as well as many departments within each of these faculties. Purposive sampling was used to choose participants from the sampled faculties. A total of 460 respondents were included in the survey, including 165 from the faculty of social science, 85 from the faculty of sciences, 50 from the faculty of humanities and arts, 40 from the faculty of engineering, 40 from the faculty of law, 20 from the faculty of medicine, 20 from the faculty of education, and 40 from the faculty of management sciences.

Data collection tools and techniques

A battery of three instruments was further adapted and used as tools for data collection. Names and details of the scales are as follows:

Academic Self-Efficacy Scale (ASES)

Based on Bandura^[1] self-efficacy theory, the Academic Self-Efficacy Scale and School Image Scale is a prepared and standardized academic self-efficacy scales for high school students. It is based on the notion that high school students' performance in each area of their studies will contribute to their overall academic self-efficacy. The inclusion of representative items from each of the construct's dimensions (learning process, reading, comprehension, memory, learning activities, time management, teacher-student relationships, peer relationships, resource use, goal orientation, coordination, and testing) as well as expert assessments of the face validity allowed for the assurance of construct validity. Test-retest coefficient of correlation was 0.85, indicating stability of score over time. Split-half reliability is 0.90. Concurrent validity with the criterion 'General Self-Efficacy Scale' is 0.43.^[34]

Dyslexia adult checklist

The dyslexia adult checklist^[29] and the British Dyslexia Association use it. It measures dyslexia among both adolescents and the adult population. The scale has 15 items, and it is scored on a 4-point Likert scale. The first ten items are scored on a scale of Rarely, Occasionally, Often, and Most of the Time.

The final five items on this scale are additionally graded as Easy, Challenging, Difficult, and Very Difficult. Less than a 45 implies that you are not dyslexic. People with dyslexia who have undergone a thorough evaluation were given the dyslexia adult checklist. It was discovered that no one who was given a comprehensive evaluation had a score below 45; it is improbable that someone with a score below 45 has dyslexia. Scores of 45 to 60 indicate symptoms of mild to moderate dyslexia. However, a few people who had never before received a dyslexia diagnosis fell into the mild-moderate category. A score of more than 60 suggests evidence of moderate to severe dyslexia.

General Health Questionnaire (GHQ-12)

The General Health Questionnaire (GHQ-12) is a self-administered screening tool designed for use in consultation settings to identify people who have a diagnosable mental illness.^[35] In addition to being a more general measure of psychiatric well-being, the 12-Item General Health Questionnaire (GHQ-12) is the most widely used screening instrument for common mental disorders. Its brevity makes it suitable for use in busy clinical settings, as well as in situations where patients require assistance in completing questionnaire^[36]; its psychometric properties have been investigated in many countries.^[37] The GHQ-12 has been used among the Nigerian population and has good psychometric properties.^[38-40]

Adult Reading History Questionnaire (ARHQ)

A self-report screening tool called the Adult Reading History Questionnaire (ARHQ)^[41] assesses for dyslexia. The ARHQ quizzes adults to find out if they are likely to have a reading disability by asking them about their reading history and present reading habits^[41] established the ARHQ's validity and reliability, and normative scores are based on real testing. ARHQ has Cronbach's alphas of 0.94 and 0.92 from two samples which exhibited internal consistency. Significant correlations (0.87 and 0.84 in the two samples) between an earlier and improved questionnaire version across several years revealed test-retest reliability.^[41]

Ethical consideration

The research intention and procedure were examined and approved by the Internal Research Ethics Committee's (IREC) of Redeemer's University, Ede, Osun State Nigeria, and the Oyo State Ministry of Education, ethical research committee. The research was carried out following the ethical standards laid down in the 1964 Declaration of Helsinki.

Results

The distribution of demographic variables by gender shows that 184 (44.6%) respondents are male, while 229 (55.4%) are female. The mean \pm standard deviation of the age of participants is 20.7 ± 2.6 . Distribution of respondents by faculty shows that 163 (39.5%) respondents are from faculty of social sciences, 81 (19.6%) respondents are from faculty of sciences, 46 (11.1%) respondents are from faculty of humanities/arts, 34 (8.2%) respondents are from faculty of engineering, 25 (6.1%) respondents are from faculty of law, 20 (4.8%) respondents are from faculty of medicine, 13 (3.1%) respondents are from faculty of education, and 31 (7.5%) respondents are from faculty of management sciences. Distribution of respondents by the level of study shows that 138 (33.4%) are from 100 level, 125 (30.3%) are from

200 level, 68 (16.5) are from 300 level, 53 (12.8) are from 400 level, and 29 (7.0%) are from 500 level.

Test of hypotheses

A regression analysis was conducted to determine the predictive influence of dyslexia on the academic self-efficacy of undergraduates at the University of Lagos (UNILAG), Nigeria. The result shown in Table 1 reveals that dyslexia significantly predicted academic self-efficacy among the participants ($\beta = 0.34$, $t = 7.31$, $P < 0.01$). The analysis in Table 1 further shows an R^2 of 0.12, which suggests that a 12.0% variance of academic self-efficacy is explained by dyslexia among the participants [$F(1, 41) = 53.47$, $P = 0.00$].

To further understand the predictive influence of dyslexia on the dimensions of academic self-efficacy, a regression analysis was conducted such that dimensions of performance in examination, comprehension, and adjustment were regressed on dyslexia; the results are presented in Table 1.

The result summarized in Table 2 reveals that dyslexia significantly predicted examination performance among the participants [$\beta = 0.32$, $F = 48.18$, $P = 0.00$]. This reported an R^2 of 0.11, which suggests that an 11.0% variance of examination performance among the participants is explained by dyslexia. The table further revealed that dyslexia significantly predicted the levels of comprehension [$\beta = 0.32$, $F = 33.54$, $P = 0.00$] and school adjustment [$\beta = 0.32$, $F = 35.86$, $P = 0.00$] among the participants. Further analysis of the interactions between dyslexia and comprehension showed an R^2 of 0.08. This suggests that 8.0% variance of comprehension among the participants is explained by dyslexia. In addition, an R^2 of 0.08, an indication that 8.0% variance of school adjustment among the participants is explained by dyslexia.

Table 2 further revealed that dyslexia significantly predicted the degrees of reading skill [$\beta = 0.21$, $F = 18.65$, $P = 0.00$], working memory [$\beta = 0.26$, $F = 28.5$, $P = 0.00$] and time management [$\beta = 0.21$, $F = 19.8$, $P = 0.00$] among the participants. In addition, the observed R^2 of 0.04, 0.07, and 0.05 was reported for reading skill, working memory, and time management, respectively. This suggests that 4% variance in reading skills, 7% variance in working memory, and 5% variance in time management are explained by dyslexia among undergraduates.

Table 1: Regression analysis of the influence of dyslexia on academic self-efficacy among UNILAG undergraduates

	B	β	t	Sig	R	R^2	F	P
(Constant)	70.54		19.33	0.00	0.34	0.12	53.47	0.00
Dyslexia	0.72	0.34	7.31	0.00				

In conclusion, this result revealed that dyslexia is a significant predictor of studied dimensions of academic self-efficacy (performance in examination, comprehension, school adjustment, reading skills, working memory, and time management) among the participants.

A regression analysis was conducted to determine the predictive influence of dyslexia on psychological distress among undergraduate students at the University of Lagos, Nigeria. The result shown in Table 3 reveals that dyslexia significantly predicted psychological distress among the participants ($\beta = 0.15, t = 3.03, P < 0.01$). The analysis summarized in Table 3 further shows an R^2 of 0.02, which suggests that 2.0% variance of psychological distress among the participants is explained by dyslexia [$F(1, 41) = 9.17, P = 0.00$]. Based on this result, it is concluded that dyslexia is a significant predictor of psychological distress among the university of Lagos undergraduates.

An independent sample *t*-test was carried out to determine the influence of gender on academic self-efficacy scores among university of Lagos undergraduates. As summarized in Table 4, the *t*-test scores showed that there were 184 male and 229 female participants surveyed, while the mean (\pm SD) of academic self-efficacy scores was 97.89 ± 19.12 and 95.21 ± 19.45 , respectively. The significant 2-tailed *P* value associated with this test was 0. The *t*-test reveals no statistically significant difference between the mean of academic self-efficacy scores of the male students and that of their female counterparts [$t(41) = 1.40, P = 0.65$]. Therefore, it can be concluded that the academic self-efficacy of the male participants is similar to that of their female students. This result shows no statistically significant gender difference in academic self-efficacy among the Nigerian Undergraduates.

An independent sample *t*-test was carried out to determine the influence of gender on psychological distress scores among university of Lagos undergraduates.

As summarized in Table 5, the *t*-test scores showed that there were 184 male and 229 female participants

surveyed, while the mean (\pm SD) of psychological distress scores was 28.64 ± 6.47 and 27.78 ± 6.53 , respectively. The significant 2-tailed *P* value associated with this test was 0. The *t*-test reveals no statistically significant difference between the mean of psychological distress scores of the male students and that of their female counterparts [$t(41) = 1.33, P = 0.19$]. Therefore, it can be concluded that the severity of psychological distress of the male participants is similar to that of their female students. Based on this result, there is no statistically significant gender difference in psychological distress among the participants.

Discussion

The main focus of this study was to determine how dyslexia predicts academic self-efficacy and psychological distress in Nigerian students. First, this study discovered that dyslexia is a strong predictor of college students' academic self-efficacy. The findings of a study, which revealed that college students with learning disabilities reported lower levels of academic self-efficacy, are consistent with this conclusion.^[41] Students with dyslexia continued to face persistent difficulties with early learning problems throughout their undergraduate studies. This is in keeping with explanations that a clear difference has been discovered in nearly all instances when comparing the academic self-concepts of dyslexic and learning-challenged children with those of their usually achieving peers.^[17] In addition, meta-analysis found that 89% of studies revealed significantly lower academic self-concept in the learning disability and dyslexic groups.^[42]

As children progress through the educational system, this result frequently appears to remain steady over time or even get worse.^[43,44] There are a few things to note here. First, it is anticipated that children who are exhibiting major learning difficulties will have poorer academic self-concepts than those who do not. These children would have an incorrect impression of how well they were doing if this were not the case. Their academic self-concept should advance in line with how they learn to deal with and eventually overcome their challenges.

Table 2: Summary of regression analysis showing the predictive influence of dyslexia on dimensions of academic self-efficacy (performance in examination, comprehension, school adjustment, reading skills, working memory, and time management) among the undergraduates in UNILAG, Lagos state

Predictor	Performance in Examination			Comprehension			School Adjustment			Reading Skills			Working Memory			Time Management		
	β	<i>t</i>	Sig.	β	<i>t</i>	Sig.	β	<i>t</i>	Sig.	β	<i>t</i>	Sig.	β	<i>t</i>	Sig.	β	<i>t</i>	Sig.
Dyslexia	0.32	6.94	0.00	0.28	5.79	0.00	0.14	0.28	0.00	0.21	4.32	0.00	5.34	0.26	0.00	0.21	4.45	0.00
<i>R</i>	0.32			0.28			0.28			0.21			0.26			0.21		
<i>R</i> ²	0.11			0.08			0.08			0.04			0.07			0.05		
<i>F</i> -ratio	48.18			33.54			35.86			18.65			28.5			19.8		
<i>P</i>	0.00			0.00			0.00			0.00			0.00			0.00		

Table 3: Regression analysis of the predictive influence of dyslexia on psychological distress among UNILAG undergraduates

	<i>B</i>	β	<i>t</i>	Sig	<i>R</i>	<i>R</i> ²	<i>F</i>	<i>P</i>
(Constant)	24.37		18.86	0.00	0.15	0.02	9.17	0.00
Dyslexia	0.11	0.15	3.03	0.00				

Table 4: Independent samples *t*-test of gender difference on academic self-efficacy among university undergraduates in UNILAG

Variables	Sex	<i>n</i>	\bar{x}	SD	<i>t</i>	<i>P</i>
Academic self-efficacy	Male	184	97.89	19.12	1.40	0.65
	Female	229	95.21	19.45		

Table 5: Independent samples *t*-test of gender difference on psychological distress among the participants

Variables	Sex	<i>n</i>	\bar{x}	SD	<i>t</i>	<i>P</i>
Psychological distress	Male	184	28.64	6.47	1.33	0.19
	Female	229	27.78	6.53		

It was also observed that dyslexia predicted performance in examination (dimension of academic self-efficacy) among undergraduates. This finding is coherent with studies.^[45,46] The study found that the dyslexic students, even well-compensated, achieved lower results than their nondyslexic peers for all examinations and a lower overall points score. In a UK study, the performance of clinical skill assessment (CSA) among doctors found that candidates who declared dyslexia had a lower chance of passing the exam compared to those who did not declare dyslexia and those who declared it late. In addition, the study reported that candidates with dyslexia required 25 per cent extra time in an exam to perform as well as those that did not declare dyslexia.^[47-49] This result is also in keeping with those who reported that a higher percentage of students living with dyslexia failed an examination compared to their counterparts who were none dyslexic.

The study also observed that dyslexia also significantly predicted comprehension (dimension of self-efficacy) among undergraduates. This aligns with the findings which did a comprehension study on a group of Danish university students with dyslexia and a comparison group of students with no history of reading problems.^[49] The author expressed the difficulty in understudying students with dyslexia in higher education because they have developed compensatory mechanisms to overcome their functional difficulties during their extended interactions with the educational system.^[49] The comprehension study discovered that students with dyslexia as a group had considerably lower comprehension of the text, and they were to read than the control group; they made more mistakes in their retellings.^[49] Furthermore, the dyslexic group had more

trouble generating inferences, rephrasing the text, and providing additional information about the topic based on the quality of the retellings. Instead, their retellings were frequently based on facts from the text, corroborating.^[50]

Everatt used dyslexic and control participants in higher education to administer an untimed reading comprehension task (the participants read four passages and answered 32 multiple-choice questions) and a timed cloze reading comprehension task.^[51] The two groups were comparable on the untimed multiple-choice test, but the dyslexic participants did worse on the timed cloze assignment. Some of the differences could also be explained by the content of the questions. Using both literal and inferential multiple-choice test questions, the study found that university students with dyslexia performed better on definitive statements than on inferential questions, indicating a specific deficit in text interpretation formation rather than reading accuracy.^[51]

Simmons and Singleton also found that while dyslexic people did not take considerably longer to read the passages than control participants, they did take significantly longer to answer the questions.^[50] The study also observed that dyslexia significantly predicts the adjustment dimension of self-efficacy. This is consistent with the findings of Pedersen.^[49] Despite the achievements of successfully gaining admission to higher education, many dyslexic students still have difficulties as they attempt to adjust to the academic reading and writing demands of higher school.^[25,30,52] Some may have passed the reading and writing requirements in elementary and secondary school, but they cannot keep up at the university level.^[53] Academic readings in university courses feature abstract technical vocabulary, new terminology, and long, syntactically complicated sentences, making them difficult to read for individuals with dyslexia.

This study also showed that dyslexia significantly predicts reading skills. This finding supports previous literature^[16,25,51] and opined that dyslexia involves difficulties in reading printed words which could subsequently lead to difficulties in reading comprehension. Theoretically, dyslexia is differentiated from poor reading occasioned by inadequate opportunities to learn or even poor quality of instruction given. In addition, dyslexia is not due to a problem in visual processing that results in letter or word reversals but combinations of certain factors such as visual temporal processing, phonology, and sequencing.^[16] The study on elementary school students^[51] affirmed that children who are not dyslexic at all are likely to respond to interventions and achieve word reading skills and fluency appropriate to their age. In addition, those diagnosed with mild dyslexia, though

have a good prognosis, would require more practice, with their reading growth path slower than children who are not dyslexic. Finally, children with severe dyslexia may not achieve reading proficiency despite intense interventions spanning a lengthy duration.^[54,55]

Furthermore, dyslexia was observed to significantly predict working memory and time management among university undergraduates. This finding supports previous research findings. For instance, according to the study,^[19] students with learning disorders such as dyslexia have a range of 20 to 50 per cent weak working memory (the ability to hold and manipulate information mentally over short periods of time).^[56] A related study affirmed that children with dyslexia often demonstrate working memory deficits.^[20] Related earlier studies concluded that verbal working memory was strongly associated with reading fluency.^[57-59] In a meta-analysis,^[60] the study reported strong evidence of a significant relationship between working memory and reading decoding/reading fluency among children. In summary, studies reveal that deficits in working memory do not always occur in every child with dyslexia or developmental language disorder (DLD); however, when they occur, there may be an underlying cause of language impairment.^[56,61,62] In addition, there is a significant deficiency in phonological working memory in children with dyslexia. Studies showed that children with dyslexia scored lower than their typically developing peers in tasks such as forward digit recall,^[63] verbal span, word recall, and nonword repetitive tasks^[64]

In addition, dyslexia was also found to predict time management among the participants. This finding supports previous research studies.^[65,66] Time management had been reported as being demanding for adults with dyslexia. For instance, adults with dyslexia reported that as children they had difficulties with months, seasons, days of the month, elapsed time, and time tables as well as issues with telling time.^[66] This research study supported that of Freidman^[67] who observed that understanding time and time management was weaker in individuals with dyslexia. This condition was seen as being more pronounced in children than on adults with dyslexia. In addition,^[68] the study found that people with dyslexia frequently reported having trouble keeping appointments on time^[66] and came to the conclusion that time management and timetables are difficult for adults with dyslexia. The difficulties people with dyslexia have with time estimation, remembering what they need to do, and, in some cases, their resistance to using time management techniques like keeping a diary or writing in a notebook are also mentioned.^[65,66] On the other hand, Kirby^[69] found that students with dyslexia made good use of time management techniques.

Our research revealed that dyslexia strongly predicted psychological distress among undergraduates, which is consistent with earlier findings.^[24,25,70] The results of the study showed that children and young people with dyslexia and other reading difficulties have a greater prevalence of mental health disorders because of shared risk factors that also predict mental health issues and reading difficulties. Risk factors for mental health problems include low self-esteem, stigma, and bullying brought on by reading difficulties.^[71] Children's mental health has been a concern for caregivers of dyslexic children.^[25,70] Strong evidence exists to substantiate the idea that dyslexia is associated with a number of psychosocial difficulties that kids encounter, such as low academic self-concept,^[72] low reading self-efficacy, and a higher prevalence of internalizing and externalizing symptoms suggestive of poor mental health.^[71,73]

Furthermore, among university undergraduates, our data showed no statistically significant gender influence on academic self-efficacy. This research supported findings that there was no appreciable difference between male and female students' levels of academic self-efficacy.^[64] In addition, this is in line with the study, which found no appreciable differences between male and female students in terms of their perceived self-efficacy in terms of problem-solving abilities.^[74] However, it was evident from the focus group talks in the same study that female students perceived male students as being more involved in the class and so feared that their confidence would not last.

In addition, our research found no discernible gender differences in psychological distress. Various research papers on the relationship between gender and psychological distress attribute the findings to social and cultural contexts. For example, the results of our study do not support a few published findings,^[75,76] suggesting females had greater psychological distress than males. However, a study from Nigeria^[77] found that men are more likely than women to experience psychological distress. According to research,^[78-79] social, biological, behavioral, and environmental factors interact in a complicated way to cause psychological distress. There have been conflicting results on the relationship between gender and mental anguish. This is because certain childhood experiences and genetic and psychosocial factors have also been described as predisposing factors influencing psychological distress.^[79]

Limitations and recommendations

Based on the findings and conclusion discussed, the following recommendations are made. The educational institutions, primarily through their policies, should consider individuals living with dyslexia and other forms of learning disabilities; research supports that with the

proper assistance, people living with dyslexia can live wholesome lives and attain academic height.

The findings of the study imply that there is room for more research. The study was conducted in one state in Nigeria and focused on one institution and students at the tertiary level of education. There are several institutions in the six geopolitical regions of the country, and this study is focused on one state. The findings of this study can therefore not be taken as conclusive. To further validate the findings of the study, there is a need to carry out this study on other parts of the country and other levels of educations and institutions.

Based on the findings of this research, it is implied that institutions could adapt teaching strategies to ensure that students with dyslexia get the support they very well need.

Conclusion

From the study's findings, the following conclusions have been made based on the study's objectives. Dyslexia significantly predicts and influences academic self-efficacy and dimensions such as performance in the examination, comprehension, school adjustment, reading skills, working memory, and time management. Dyslexia also significantly predicts psychological distress. Gender has no significant influence on the manifestation of academic self-efficacy and psychological distress among undergraduates.

Informed consent

With regards to international standards participants, written informed consent was obtained for this study.

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Conflicts of interest

There are no conflicts of interest.

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