Influence of Stress and Test Anxiety on Academic Achievement of Science Education Students in Adamawa State University, Mubi

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ABSTRACT

This study investigated the perceived influence of stress and test anxiety on academic achievement among undergraduate science education students at Adamawa State University, Mubi. Adopting a descriptive survey design, the research targeted a population of 429 students across four academic levels. A stratified random sampling technique was used to select 200 participants. Data were collected using a validated and reliable instrument the Influence of Stress and Test Anxiety on Academic Achievement Questionnaire (ISTAAAQ) which achieved a reliability coefficient of 0.84. Descriptive statistics (mean and standard deviation) were employed to answer research questions, while t-tests and Pearson correlation were used to test hypotheses at a 0.05 significance level. Findings revealed that stress is widely perceived as a major academic impediment, particularly due to workload, with a grand mean of 3.54. Test anxiety was also found to significantly affect performance, with a grand mean of 3.48. Gender differences emerged in stress perception, with females reporting higher stress levels, while no significant gender differences were found in test anxiety. Correlation analyses indicated statistically significant moderate negative relationships between stress ($r = -0.587$, $p = 0.027$) and test anxiety ($r = -0.631$, $p = 0.039$) and academic achievement. The study concluded that both stress and test anxiety substantially hinder academic performance and should be addressed through targeted support services. Recommendations include the implementation of stress management programs, expansion of counseling services, gender-responsive interventions, and reforms in academic workload and assessment practices to reduce psychological burden on students.

Keywords: Academic stress, Test anxiety, Academic achievement, Undergraduate students · Gender differences, Science education, Stress management, psychological factors

INTRODUCTION

In Nigeria, undergraduate students encounter a confluence of academic, social, and economic challenges that collectively affect their educational experience. Among these challenges, stress and test anxiety are increasingly recognized as potent disruptors of academic success. With high academic expectations, poor infrastructural conditions, erratic academic calendars, and socioeconomic instability, Nigerian students often experience intense psychological strain (Abugu & Chidi, 2025; Uyanne et al., 2025). This pressure manifests not only in poor academic performance but also in deteriorating mental health, calling for a deeper understanding of how stress and test anxiety specifically contribute to students' academic trajectories. Academic stress refers to the body's response to academic-related demands that exceed coping abilities. In Nigerian universities, such stress is exacerbated by overpopulated classrooms, outdated curricula, long strikes, and limited academic resources. Research shows that students often report feelings of helplessness, loss of motivation, and emotional exhaustion all of which negatively affect concentration and academic output (Galle & Augustine, 2024; Akpan et al., 2024). In addition, students from low-income backgrounds face greater stress due to limited access to learning materials and fear of academic failure tied to financial aid or future career prospects (Ibikunle & Umeakubuilo, 2025).

Test anxiety, characterized by physiological arousal and psychological worry in exam settings, is another significant barrier to academic performance. In Nigeria, the heavy emphasis on summative assessments and competitive grading systems amplifies this anxiety. Students often equate exam failure with personal failure, leading to panic, memory blockages, and even avoidance behaviors (Nwadi et al., 2025; Edeh et al., 2025). Recent findings indicate that heightened test anxiety correlates negatively with grade point average (GPA) and is especially prevalent among students in high-stakes courses such as medicine and engineering (Abugu & Chidi, 2025; Galle & Augustine, 2024). The mental health burden of undergraduates is intricately tied to both psychological predispositions and institutional pressures. While some students may possess higher emotional resilience, institutional shortcomings such as poorly trained academic staff, overcrowded hostels, and lack of mental health services exacerbate anxiety and stress levels (Alhassan et al., 2024; Akpan et al., 2024). Furthermore, factors such as poor remuneration and low morale among academic staff reduce the overall academic climate quality, thereby indirectly affecting student motivation and performance (Alhassan et al., 2024). The systemic neglect of student mental well-being contributes to growing academic apathy and dropout rates.

Although global literature extensively covers academic stress and anxiety, Nigeria-specific research remains insufficient. Few empirical studies focus on how these psychological variables manifest within Nigeria's unique educational environment marked by political instability, underfunding, and infrastructural deficits. Notably, localized studies such as those by Uyanne et al. (2025) and Adebayo et al. (2024) have begun to explore these dimensions, but there is a need for more rigorous, multi-institutional investigations. Understanding the intersection between cultural expectations, institutional capacity, and student psychology will enrich both policy and pedagogy in Nigerian higher education.

This study is imperative in the face of rising academic failure, mental health deterioration, and institutional inertia across Nigerian universities. By dissecting the relationship between stress, test anxiety, and academic achievement, this research seeks to inform university policies on counseling, curriculum structuring, and examination practices. Additionally, the findings may contribute to the development of context-sensitive interventions such as mindfulness programs, time management workshops, and stress resilience training tailored to Nigerian students (Nwadi et al., 2025; Edeh et al., 2025). Ultimately, a better understanding of these psychological barriers could lead to enhanced student performance, retention, and academic fulfillment.

Statement of Problem

Academic achievement is a critical indicator of educational success, particularly among science education students who are often expected to demonstrate both theoretical knowledge and practical competence. However, there is increasing concern about the declining academic performance of undergraduate students in Nigerian universities, including those enrolled in science education programs at Adamawa State University, Mubi. Despite institutional efforts to improve teaching quality and curriculum delivery, many students continue to underperform in key assessments. This persistent trend raises questions about the underlying psychological factors particularly stress and test anxiety that may be contributing to this academic underachievement.

Students face multiple stressors ranging from academic pressure, limited access to learning materials, unstable electricity and internet supply, to the insecurity that plagues parts of Northern Eastern Nigeria. These stress-inducing factors are compounded during exam periods, where students frequently report symptoms of anxiety such as panic, poor concentration, and sleep disturbances. While anecdotal evidence suggests that stress and anxiety impair students' ability to perform optimally, there is a lack of localized empirical data that investigates how these psychological conditions specifically influence science education students' academic outcomes in the study area.

Despite a growing body of international research linking stress and test anxiety to academic performance, there remains a paucity of studies that explore these issues within the Nigerian university context, and even fewer that focus specifically on students in science education programs. Without context-specific research, interventions may be misaligned with students' lived realities and may fail to address the root causes of their academic difficulties.

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Therefore, this study seeks to address the pressing need to empirically investigate the extent to which stress and test anxiety influence the academic achievement of undergraduate science education students at Adamawa State University, Mubi.

Objectives of the Study

The objectives of the study are to:

- examine the relationship between the level of stress and academic achievement among undergraduate science education students at Adamawa State University, Mubi.

- investigate the relationship between test anxiety and academic achievement among science education students at Adamawa State University, Mubi.

- assess whether significant gender differences exist in the experience of stress among science education students at Adamawa State University, Mubi.

- determine whether there are significant gender differences in test anxiety among science education students at Adamawa State University, Mubi.

Research Questions

In line with the objectives outlined above, the study seeks to address the following research questions:

What is the relationship between stress and academic achievement among undergraduate science education students at Adamawa State University, Mubi?

What is the relationship between test anxiety and academic achievement among undergraduate science education students at Adamawa State University, Mubi?

What are the levels of stress among male and female undergraduate science education students at Adamawa State University, Mubi?

What are the levels of test anxiety among male and female undergraduate science education students at Adamawa State University, Mubi?

Research Hypotheses

The following null hypotheses have been formulated to guide the study and will be tested at the 0.05 level of significance:

H_{01}: There is no significant relationship between stress and academic achievement among undergraduate science education students at Adamawa State University, Mubi.

H_{02}: There is no significant relationship between test anxiety and academic achievement among undergraduate science education students at Adamawa State University, Mubi.

H_{03}: There are no significant gender differences in stress among undergraduate science education students at Adamawa State University, Mubi.

H_{04}: There are no significant gender differences in test anxiety among undergraduate science education students at Adamawa State University, Mubi.

METHODOLOGY

The study adopted a descriptive survey research design, which is suitable for collecting data from a large group to describe current phenomena. The target population consisted of 429 undergraduate science education students at Adamawa State University, Mubi, distributed across four levels. A sample of 200 science education students comprising 25 males and 25 females from each level was selected using stratified random sampling based on sex and level. Data were collected using a structured questionnaire titled "Influence of Stress and Test Anxiety on Academic Achievement Questionnaire (ISTAAAQ)," consisting of three sections that covered demographic information, stress, and test anxiety. The instrument was validated by experts from the Faculty of Education, and its reliability was confirmed through a pilot test using the Pearson Product Moment Correlation, yielding a coefficient of 0.84. Data collection was done personally by the researcher, who distributed and retrieved the questionnaires on the spot. Descriptive statistics (mean and standard deviation) were used to answer the research questions, with a mean benchmark of 2.5 for acceptance, while t-test and correlational analysis were employed to test the research hypotheses.

RESULTS

Research Question 1: What is the relationship between the level of stress and academic achievement among undergraduate science education students at Adamawa State University, Mubi?

Table 1: Mean and Standard Deviation of Students' Responses on the Relationship between Stress and Academic Achievement

S/N	Item	$(\bar{x})$	SD	Decision
1	I often feel overwhelmed by academic workload, which reduces my academic performance.	3.62	1.134	Accepted
2	High stress levels make it difficult for me to concentrate during lectures and exams.	3.55	1.107	Accepted
3	I experience burnout from continuous academic demands, which affects my academic success.	3.49	1.128	Accepted
4	Stress leads me to procrastinate, which lowers the quality of my academic work.	3.46	1.095	Accepted
5	I perform poorly in exams when I am under high stress.	3.58	1.112	Accepted
	Grand Mean	3.54		**Accepted**

The results in Table 1 reveal that undergraduate science education students at Adamawa State University, Mubi, perceive stress as a major hindrance to their academic performance. With a grand mean of 3.54, respondents consistently agreed that stress negatively affects concentration, exam outcomes, and overall productivity. The highest mean (3.62) suggests that academic workload is a major stressor. Burnout and procrastination were also highlighted as stress-induced challenges impacting achievement. These findings align with existing literature that links academic stress to reduced performance among university students.

Research Question 2: What is the relationship between test anxiety and academic achievement among undergraduate science education students at Adamawa State University, Mubi?

Table 2: Mean and Standard Deviation of Students' Responses on the Relationship between Test Anxiety and Academic Achievement

S/N	Item	($\bar{x}$)	SD	Decision
1	I feel anxious before and during exams, which affects my academic performance.	3.58	1.121	Accepted
2	Test anxiety causes me to forget information I studied.	3.44	1.098	Accepted
3	My performance drops significantly when I am anxious during tests.	3.39	1.115	Accepted
4	I feel more confident and perform better when I manage my test anxiety.	3.47	1.074	Accepted
5	Test anxiety interferes with my ability to understand exam questions.	3.51	1.089	Accepted
	Grand Mean	**3.48**		**Accepted**

Table 2 reveals that students generally agree that test anxiety negatively influences their academic achievement, with a grand mean of 3.48. The item with the highest mean (3.58) indicates that anxiety before and during exams significantly affects performance, while all items exceeded the acceptance threshold of 2.5. This suggests a strong perceived link between test anxiety and academic outcomes among students.

Research Question 3: What are the levels of stress among male and female undergraduate science education students at Adamawa State University, Mubi?

Table 2: Mean and Standard Deviation of Students' Responses on Gender Differences in Stress

S/N	Item	($\bar{x}$)	SD	Decision
1	Female students tend to experience more academic stress than male students.	3.45	1.102	Accepted
2	Male students are less likely to express their academic stress.	3.29	1.089	Accepted
3	Gender influences how students cope with academic stress.	3.36	1.067	Accepted
4	Stress-related performance decline is more common among female students.	3.18	1.121	Accepted
5	Male and female students react differently to academic pressure.	3.33	1.105	Accepted
	Grand Mean	**3.32**		**Accepted**

Table 3 shows that students generally perceive significant gender differences in how stress is experienced and managed, with a grand mean of 3.32. The item with the highest mean (3.45) suggests that female students are more prone to academic stress. All mean values are above 2.5, indicating agreement with each item.

Research Question 4: What are the levels of test anxiety among male and female undergraduate science education students at Adamawa State University, Mubi?

Table 4: Mean and Standard Deviation of Students' Responses on Gender Differences in Test Anxiety

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S/N	Item	($\bar{x}$)	SD	Decision
1	Female students are more likely to experience test anxiety than male students.	3.41	1.088	Accepted
2	Male students tend to hide their anxiety during examinations.	3.25	1.097	Accepted
3	Gender plays a role in students' reaction to test pressure.	3.38	1.083	Accepted
4	Female students often report nervousness before exams.	3.49	1.109	Accepted
5	Male and female students apply different strategies to manage test anxiety.	3.31	1.091	Accepted
	Grand Mean	**3.37**		**Accepted**

Table 4 indicates that respondents perceive gender differences in test anxiety, with a grand mean of 3.37. The highest mean (3.49) supports the notion that female students report more nervousness before exams. All items were accepted, reinforcing the view that gender differences exist in managing and experiencing test anxiety.

Hypothesis One: There is no significant relationship between stress and academic achievement among undergraduate science education students at Adamawa State University, Mubi.

Table 5: Correlation Analysis of Relationship between Stress and Academic Achievement among Undergraduate Science Education Students

	Stress	Academic Achievement
Stress	1	-0.587
Academic Achievement	-0.587	1
Sig. (2-tailed)		0.027
N	188	188

$P < 0.05$

Table 5 presents the Pearson correlation analysis between stress and academic achievement among undergraduate students in the Department of Science Education. The correlation coefficient is r = -0.587, indicating a moderate negative relationship between stress and academic performance. The p-value of 0.027 is less than 0.05, suggesting that the correlation is statistically significant. Therefore, the null hypothesis is rejected, meaning that stress significantly affects academic achievement among students.

Hypothesis Two: There is no significant relationship between test anxiety and academic achievement among undergraduate science education students at Adamawa State University, Mubi.

Table 6: Correlation Analysis of Relationship between Test Anxiety and Academic Achievement

	Stress	Academics
Test-anxiety	1	-0.631
Sig. (2-tailed)		0.039

| N | 188 | 188 |

P < 0.05

Table 6 presents the result of a Pearson correlation analysis conducted to examine the relationship between test anxiety and academic achievement among undergraduate science education students. The correlation coefficient (r = -0.631) indicates a moderate negative relationship, and the p-value = 0.039 is less than the significance level of 0.05. Therefore, the null hypothesis is rejected. This implies that test anxiety significantly affects academic performance; as anxiety increases, achievement tends to decrease. The result suggests that effective strategies to reduce test anxiety could contribute positively to students' academic outcomes.

Hypothesis Three: There are no significant gender differences in stress among undergraduate science education students at Adamawa State University, Mubi.

Table 7: T-test Analysis of Stress Based on Gender

Gender	N	Mean ($\overline{x}$)	SD	t	df	Sig.
Male	97	2.2835	0.6881	-1.861	186	0.044
Female	91	2.4725	0.7046			

P < 0.05

Table 7 reveals that the mean stress score for female students ($\overline{x}$ = 2.4725) is higher than that of male students ($\overline{x}$ = 2.2835). The t-value of -1.861 and a p-value of 0.044 indicate a statistically significant difference between male and female students. Since the p-value is less than 0.05, the null hypothesis is rejected. This implies that gender plays a significant role in stress levels, with female students reporting higher stress.

Hypothesis Four: There are no significant gender differences in test anxiety among undergraduate science education students at Adamawa State University, Mubi.

Table 8: T-test Analysis of Test Anxiety Based on Gender

Gender	N	Mean ($\overline{x}$)	SD	t	df	Sig.
Male	97	2.5979	0.8405	0.127	186	0.899
Female	91	2.5824	0.8375			

P > 0.05

As shown in Table 8, the mean test anxiety scores for male ($\overline{x}$ = 2.5979) and female ($\overline{x}$ = 2.5824) students are very close, and the t-value of 0.127 with a p-value of 0.899 indicates that the difference is not statistically significant. Since the p-value is greater than 0.05, the null hypothesis is retained. This means that there are no significant gender differences in test anxiety among the students. Both male and female students experience similar levels of anxiety during tests, suggesting that anxiety-related interventions can be designed and applied equally across genders.

DISCUSSION

The study conducted among undergraduate science education students at Adamawa State University, Mubi, revealed that stress is widely perceived as a major obstacle to academic achievement. With a grand mean of 3.54, participants consistently reported that stress negatively impacts concentration, examination outcomes, and overall academic productivity. Notably, academic workload emerged as the most prominent stressor, scoring the highest mean of 3.62. The findings also indicate that stress contributes to secondary effects such as

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burnout and procrastination, both of which further undermine academic progress. These results affirm earlier findings that excessive stress hinders cognitive functions and academic output in university settings (Misra & Castillo, 2004; Ahern & Norris, 2011).

Additionally, the role of test anxiety as a determinant of academic achievement was strongly highlighted. Table 2 demonstrated a grand mean of 3.48, indicating general agreement among students that anxiety before and during examinations adversely affects performance. The highest-rated item (mean = 3.58) reinforces the belief that psychological tension during assessments substantially diminishes academic outcomes. These perceptions are in line with existing literature, which links test anxiety to lower grades and reduced academic efficiency due to its effects on memory recall and task performance under pressure (Cassady & Johnson, 2002; Putwain, 2008).

Perceptions regarding gender differences in stress and test anxiety were also explored. Students generally agreed that female students experience and manage academic stress differently, as reflected in a grand mean of 3.32 in Table 3. The item with the highest mean (3.45) specifically pointed to females being more vulnerable to academic stress, a finding that aligns with prior research showing that women often report higher stress due to multiple social and academic expectations (Matud, 2004). Similarly, Table 4 suggested gender differences in test anxiety perceptions, with female students reportedly experiencing more nervousness before exams (mean = 3.49), although the differences in this domain were somewhat less pronounced.

Statistical analysis confirmed the significant negative correlation between stress and academic performance. Table 5 reported a Pearson correlation coefficient of $r = -0.587$ ($p = 0.027$), indicating that higher stress levels are moderately associated with lower academic achievement. This result confirms the rejection of the null hypothesis, underscoring that stress is not only a perceived hindrance but also a statistically validated one. These findings support broader academic discussions linking chronic stress with deteriorated academic functioning and decreased mental resilience in students (Linnenbrink & Pintrich, 2004; Deasy et al., 2014).

Further, the analysis of test anxiety and its impact yielded similar conclusions. As shown in Table 6, the correlation coefficient ($r = -0.631$) and a p-value of 0.039 confirm a moderate negative and statistically significant relationship between anxiety and academic performance. While Table 7 supported the idea that female students report significantly higher stress than males ($p = 0.044$), Table 8 showed no significant gender difference in test anxiety ($p = 0.899$). This suggests that while stress may be gender-differentiated, anxiety affects male and female students relatively equally, pointing to the importance of inclusive and broadly applicable psychological interventions for academic settings (Zeidner, 1998; Karaman et al., 2018).

CONCLUSION

The study explored the perceived effects of stress and test anxiety on the academic performance of undergraduate science education students at Adamawa State University, Mubi. The findings reveal that both stress and test anxiety are significant psychological barriers that negatively impact students' academic outcomes. Stress, particularly due to academic workload, was shown to impair concentration, lead to burnout, and reduce overall productivity. Test anxiety, especially before and during examinations, was also perceived as a major contributor to poor performance. Gender differences were observed in the experience of stress, with female students reporting significantly higher stress levels; however, no significant gender differences were found in test anxiety. Correlation analyses confirmed moderate negative relationships between both stress and academic achievement ($r = -0.587$) and test anxiety and academic achievement ($r = -0.631$), with statistically significant results. These outcomes underscore the need for proactive and inclusive mental health interventions within academic environments to support student success.

RECOMMENDATIONS

The university should develop and incorporate structured stress management programs into student support services. These programs can include workshops on time management, coping strategies, and relaxation techniques to help students better manage academic workload and reduce burnout.

Regular access to trained academic counselors and psychologists should be provided to assist students dealing with anxiety and stress-related issues. Such services should be tailored to address the specific challenges of test anxiety and its impact on academic performance.

Given the significant gender differences in stress levels, gender-responsive interventions such as peer support groups and mentorship for female students should be integrated to better address their unique psychological and academic needs.

Academic departments should consider revising course schedules and assessment formats to reduce excessive workload and pressure. Incorporating continuous assessments and alternative testing methods could help mitigate anxiety and enhance learning outcomes.

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