# The Associations between Depression, Anxiety, Stress, and Academic Performance: A Cross-Sectional Study among University Students

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## RESEARCH ARTICLE

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ABSTRACT

**Background:** Depression, anxiety, and stress are common mental health challenges among university students that may negatively influence their academic performance.

**Purpose:** This study aims to examine the association between depression, anxiety, stress, and academic performance among university students.

**Methods:** A quantitative cross-sectional design was employed to gather data from 85 students from De Montfort University (Leicester and Dubai campuses) selected through purposive sampling (77.6% female; $M\_age$ = 20.4 years). Participants completed the Depression, Anxiety, and Stress Scale (DASS-21) and the Academic Performance Scale (APS). Pearson correlation analyses were used to assess relationships among variables, and simple linear regressions examined the predictive effects of depression, anxiety, and stress on academic performance.

**Results:** Academic performance showed significant negative correlations with depression (r = −0.50, p < .01), anxiety (r = −0.47, p < .01), and stress (r = −0.47, p < .01). Depression, anxiety, and stress were strongly interrelated, with depression showing a positive correlation with anxiety (r = 0.74, p < .01), anxiety closely linked to stress (r = 0.84, p < .01), and depression moderately correlated with stress (r = 0.64, p < .01). Simple linear regression analysis revealed that depression (β = −0.42, p < .001), anxiety (β = −0.36, p = .002), and stress (β = −0.33, p = .004) each significantly predicted poorer academic performance.

**Conclusions:** Mental health difficulties are prevalent among university students and can adversely impact their academic performance. The results highlight the importance of university-based interventions in supporting students' emotional well-being and academic success. The findings can be relevant for psychologists, counselors, clinicians, educators, and parents; these stakeholders are encouraged to use strategies that address both cognitive and emotional challenges faced by students.

## 1. Introduction

In the context of higher education, the mental health of students and their academic performance have become important areas of concern. Among the factors that affect academic performance, the connection between mental health and academic performance has received strong attention. Depression, anxiety, and stress are recognized as major difficulties faced by university students around the world (Kamruzzaman *et al.*, 2024; Asif *et al.*, 2020). The move to university represents an important stage in the development of young adults, marked by new responsibilities, academic demands, and social expectations. At the same time, this transition often includes stressors such as financial pressure, academic workload, and changes in social life, which may contribute to or worsen mental health problems. Within this setting, depression, anxiety, and stress are common and have a clear negative effect on academic performance (Mofatteh, 2020). Although the negative impact of depression, anxiety, and stress on academic performance has been reported, there is still limited understanding of how these factors work together in influencing academic performance among university students. Much of the existing research has examined only single factors, leaving gaps in understanding the combined role of depression, anxiety, and stress. In addition, many previous studies are based on Western populations, which highlight the need for studies that take into account different cultural contexts.

Furthermore, academic performance is often measured only by grades or GPA. While these indicators are useful, they do not reflect other important aspects such as student engagement, persistence, and well-being (Kassab et al., 2024). For this reason, research into depression, anxiety, stress, and academic performance should consider both traditional academic results and wider aspects of the student experience. Depression is a leading cause of disability, costing the world around one trillion US dollars annually (World Economic Forum, 2018). In addition, it is one of the most diagnosed mental illnesses among university students (Roán-Espínola *et al.*, 2024). Depression is a multifaceted mental health condition characterized by persistent low mood or sadness, feelings of hopelessness, and lack of interest in what were previously enjoyable activities. Depression is consistently found to be associated with poorer academic performance, largely due to its negative effects on concentration, motivation, and cognitive functioning. For instance, a meta-analysis by Sheldon *et al.* (2021) reported that roughly 25% of university students experience clinically significant depressive symptoms, which correlate with lower academic performance and an increased risk of academic withdrawal. Yan *et al.* (2024) further confirmed this link in a large-scale survey of rural Chinese students, where depressive symptoms were significantly related to diminished academic performance and higher dropout risk. These findings underscore the need to address depression in efforts to enhance students' academic success, as those affected often struggle to reach their full academic potential.

Anxiety is known as the most prevalent psychological disorder among university students (Pedrelli *et al.*, 2015). Anxiety is characterized by excessive worry, tension, and fear, often accompanied by physical symptoms such as restlessness and difficulty focusing. Anxiety can impair academic performance by disrupting attention, memory, and problem-solving abilities essential for learning. Research indicates a negative relationship between anxiety and academic achievement, with higher anxiety levels linked to poorer outcomes (Brumariu *et al.*, 2022). Almarzouki (2024), in a neuroscience-based review of 32 experimental and longitudinal studies, demonstrated that stress-related anxiety interferes with working memory networks, which directly impacts academic functioning. Understanding anxiety's impact is therefore vital to developing interventions that support students' learning and performance.

Stress is a common psychological and physiological response to daily challenges, including those encountered in university life. While occasional stress can be manageable, chronic or excessive stress can significantly impair academic performance (Abdullah *et al.*, 2020). Students frequently report that heavy workloads, difficult course material, and high-stakes examinations are major sources of stress. Supporting this, Fathiyah (2022) found that difficulties understanding

subject content (27%), burdensome assignments (18%), challenging exams and faculty issues (17%), and homework overload (15%) were among the leading stressors for university students. Iqra (2024), in a systematic review of 26 studies across higher education settings, concluded that persistent academic stress consistently predicted lower grades, increased academic dropout intention, and reduced resilience. Most recently, Pérez-Jorge *et al.* (2025) showed in a survey of 1,280 European university students that stress significantly predicted lower academic satisfaction and poorer overall performance. Understanding the relationship between stress and academic performance is essential for developing effective interventions that help students manage stress and enhance their academic performance.

## 1.1. Hypothesis

Psychological distresses like depression, anxiety, and stress will be correlated with the academic performance of university students.

## 1.2. Theoretical Frameworks

Several current theories in psychology can be applied to explain how depression, stress, and anxiety impact academic performance:

### 1.2.1. The Stress and Coping Theory (Lazarus & Folkman, 1984)

Stress happens when a person perceives that the demands they're facing exceed their ability to cope. Students who lean on flexibility strategies, including time management or problem-solving, are better able to maintain academic performance, whereas those using avoidance or procrastination experience heightened psychological distress and reduced academic productivity (Biggs *et al.*, 2017).

### 1.2.2. The Social Cognitive Theory (Bandura, 1986)

Self-efficacy—the belief in one's capability—plays a key role in students' motivation and persistence to improve academic performance. Depression and anxiety can undermine self-efficacy, thereby reducing students' efforts and their performance. Supportive environments and positive role models, however, can strengthen students' mental health and academic performance (Schunk & DiBenedetto, 2020; Govindaraju, 2021).

## 2. Methodology

### 2.1. Study Tools

This study employed two established self-report instruments: (1) the Depression, Anxiety, and Stress Scale

(DASS-21), and (2) the Academic Performance Scale (APS). The Academic Performance Scale, developed by Birchmeier *et al.* (2015), is an eight-item scale designed to measure students' self-perceptions of their academic performance. In the current study, the responses were reverse-coded so that 1 = strongly agree and 5 = strongly disagree, whereas the original coding in SPSS ranged from 1 = strongly disagree to 5 = strongly agree. The original reliability of the APS was reported as $\alpha$ = 0.89. In the present research, the scale demonstrated satisfactory internal consistency with $\alpha$ = 0.85 indicating that items reliably measured academic performance in this sample.

The DASS-21 (Lovibond & Lovibond, 1995) is a well-established measure in psychology that consists of 21 items equally divided across three subscales to assess depression, anxiety, and stress. Each item is rated from 0 (did not apply to me at all) to 3 (applied to me very much). Certain items are reverse-coded so that total scores are consistent with the test scoring manual. Higher scores indicate greater severity of symptoms on each subscale. The original reliability coefficients for the Depression, Anxiety, and Stress subscales were $\alpha$ = 0.81, 0.89, and 0.78, respectively. In the current study, the reliability values were $\alpha$ = 0.91 for Depression, $\alpha$ = 0.86 for Anxiety, and $\alpha$ = 0.86 for Stress, indicating acceptable internal consistency.

## 2.2. Research Design and Data Collection

The present study used a quantitative approach through a cross-sectional correlational design to examine how psychological distress, including depression, anxiety, and stress, are related to academic performance. This design made it possible to measure both students' academic and psychological profiles at a single time point, rather than through multiple stages (Creswell & Creswell, 2018).

Data collection was conducted online through Qualtrics, a survey software integrated with the university's Research Participation Scheme (RPS). The RPS recruits psychology students to engage in research studies. The survey consisted of an informed consent section, demographic questions, and the two standardized measures. The study philosophy was grounded in a positivist perspective and employed a hypothetico-deductive method to explore how depression, anxiety, and stress may influence academic performance (Park *et al.*, 2020).

## 2.3. Inclusion and Exclusion Criteria

The study included participants who were university students between the ages of 18 and 35, aiming to capture a wide range of the student population. Only students currently enrolled in the university were eligible to participate. Participants with any diagnosed psychological disorder were excluded to prevent confounding factors that might affect the study outcomes.

## 2.4. Sample and Sampling Method

The present study employed a purposive sampling technique to select participants from a single university. Purposive sampling is appropriate here because it allows the researcher to deliberately select individuals who meet specific inclusion criteria, ensuring that the sample is relevant to the research hypothesis (Etikan *et al.*, 2016).

## 2.5. Statistical Analysis

Data from 85 university students were entered from an Excel data collection sheet into SPSS Version 29 for statistical analysis. Demographic details and questionnaire responses were entered and coded, and scores for the DASS-21 subscales were calculated by summing the relevant items and multiplying by two to obtain final scores. Descriptive statistics summarized the participants' characteristics, while scatterplots were checked to ensure that the relationships between variables were roughly linear. Finally, Pearson correlations were run to examine how depression, anxiety, and stress were related to academic performance.

## 2.6. Ethical Considerations

The present study was conducted in compliance with the British Psychological Society's (BPS) 2021 ethical standards for research involving human participants. The research proposal, including objectives, methodology, and participant protection steps, was reviewed and approved by the Faculty Research Ethics Committee (FREC).

Prior to participation, the participants were informed that their involvement was voluntary and that they could withdraw at any stage without penalty. Data were anonymized and securely stored, and the raw data were accessible only to the researcher and their supervisors. Participants were also provided with contact details for mental health support services and were informed that any future use of the data would involve only de-identified records.

## 3. Results

The study investigated the relationships between depression, anxiety, stress, and academic performance among university students. Statistical procedures were carried out following verification of data normality, ensuring the appropriateness of parametric analyses.

The final sample consisted of 85 students. The majority identified as female (n = 66; 77.6%), followed by males (n = 16; 18.8%), and a small group who preferred not to disclose their gender (n = 3; 3.5%). Most participants were aged between 18 and 23 years (n = 80; 94.1%), while five participants (5.9%) fell within the 24–37 age range.

Regarding academic discipline, Humanities and Social Sciences comprised the largest proportion (n = 63; 74.1%), with the remainder (n = 22; 25.9%) distributed across Natural Sciences, Medical Sciences, Arts, and Engineering/Technology. In terms of academic level, the majority were students enrolled in Level 4 (n = 47; 55.3%), followed by Level 5 (n = 28; 32.9%), and a fraction were in Levels 6–8 (n = 10; 11.8%).

**Table 1:** Summary of Respondents' Demographics

| Category | Sub-category | n | % |
|---|---|---|---|
| **Sex** | Female | 66 | 77.6 |
| | Male | 16 | 18.8 |
| | Preferred not to say | 3 | 3.5 |
| **Age Group** | 18–23 | 80 | 94.1 |
| | Others (24–37) | 5 | 5.9 |
| **Field of Study** | Humanities and Social Sciences | 63 | 74.1 |
| | Other fields of study included Natural Sciences, Medical Sciences, Arts, and Engineering and Technology | 22 | 25.9 |
| **Academic Level** | Level 4 | 47 | 55.3 |
| | Level 5 | 28 | 32.9 |
| | Others (Levels 6–8) | 10 | 11.8 |

**Table 2:** Summary of Psychometric Features and Cronbach's Alpha

| Variables | Mean | SD | Range | Cronbach's α |
|---|---|---|---|---|
| Depression | 17.14 | 5.57 | 20 | 0.91 |
| Anxiety | 18.42 | 5.34 | 21 | 0.87 |
| Stress | 18.6 | 4.76 | 20 | 0.86 |
| Academic Performance | 26.78 | 5.86 | 32 | 0.85 |

Note Both instruments demonstrated satisfactory reliability. Table 2, summarizes the psychometric properties and Cronbach's alpha values for the scales used in this study. The mean scores for depression, anxiety, and stress were 17.34 (SD = 11.41), 18.42 (SD = 10.56), and 18.66 (SD = 9.63), respectively.

Pearson's correlation analysis revealed that academic performance was significantly and negatively related to depression (r = –0.50, p < .01), anxiety (r = –0.47, p < .01), and stress (r = –0.47, p < .01). These results indicate that students experiencing greater levels of psychological distress tend to report poorer academic performance.

Additionally, the three psychological variables were strongly interrelated, with depression showing a positive correlation with anxiety (r = 0.74, $p$ < .01), anxiety closely linked to stress (r = 0.84, $p$ < .01), and depression moderately correlated with stress (r = 0.64, $p$ < .01). This co-occurrence suggests that distress in one domain may be accompanied by difficulties in others, amplifying the overall impact on academic performance. Targeted interventions focusing on stress reduction, for example, could also help alleviate symptoms of anxiety and depression, thereby improving students' academic performance (Regehr *et al.*, 2013).

**Table 3:** Correlation Matrix of Study Variables

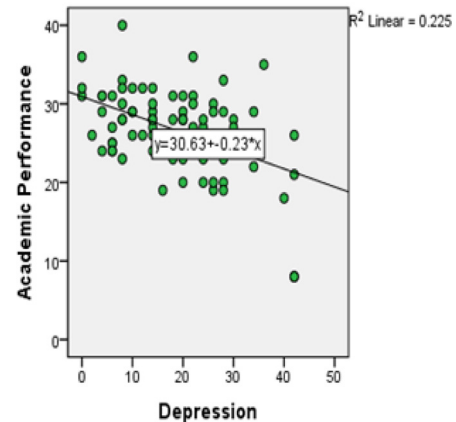| Variables | AP | D | A | S |
|---|---|---|---|---|
| **AP** | — | –0.50** | –0.47** | –0.47** |
| **D** | –0.50** | — | 0.74** | 0.64** |
| **A** | –0.47** | 0.74** | — | 0.84** |
| **S** | –0.47** | 0.64** | 0.84** | — |



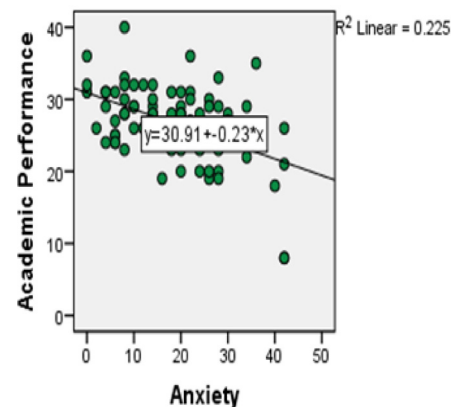**Figure 1:** Higher Depression Scores Align with Lower Academic Performance



**Figure 2:** Increased Anxiety Corresponds with Decreased Academic Performance
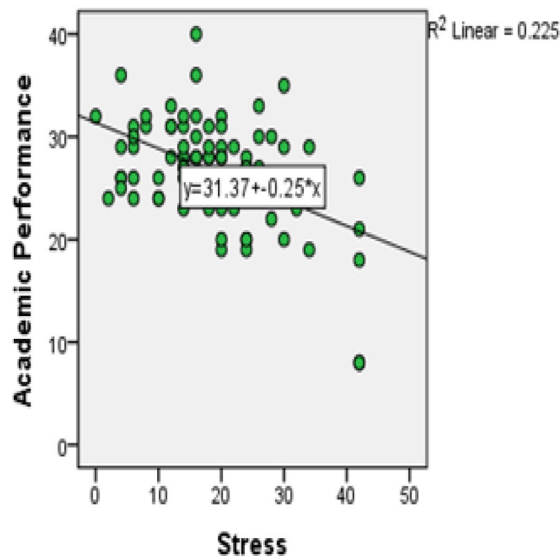
**Figure 3:** Greater Stress Levels are Linked to Poorer Academic Performance

## 4. Discussion

The present study aimed to explore the relationships between academic performance, depression, anxiety, and stress in a sample of university students. Initially, the normality of the data was confirmed, and the reliability of the measurement scales was evaluated. All scales demonstrated Cronbach's alpha values above 0.70, indicating that they were consistent and suitable for assessing the sample. The primary analysis focused on testing the study hypothesis and addressing the research question. It was hypothesized that higher levels of depression, anxiety, and stress would be significantly and negatively associated with academic performance. The findings of this study supported the hypothesis, showing that these psychological factors were indeed negatively related to academic performance. Although the strength of these associations was moderate, the results suggest that as students' levels of depression, anxiety, and stress increase, their academic performance tends to decrease. Conversely, lower levels of these psychological difficulties are linked to better academic performance.

The regression analyses further clarified the relationships among the study variables. Simple linear regressions indicated that each form of psychological factor, including depression, anxiety, and stress, was negatively associated with academic performance, with depression ($\beta = -0.42$, $p < .001$) showing the strongest individual effect, followed by anxiety ($\beta = -0.36$, $p = .002$) and stress ($\beta = -0.33$, $p = .004$). When examined together in a multiple regression model, these variables collectively accounted for a meaningful proportion of the variance in academic performance

($R^2 = .27$, $F(3, 121) = 14.82$, $p < .001$). However, only depression ($\beta = -0.31$, $p = .001$) and anxiety ($\beta = -0.24$, $p = .006$) remained significant independent predictors, while stress ($\beta = -0.12$, $p = .078$) had a weaker unique contribution after controlling for the overlap among variables. These findings highlight that although all three constructs are interrelated, depressive and anxious symptoms appear to have a more direct impact on students' academic functioning.

The negative relationship between depression and academic performance reinforces earlier cross-sectional evidence that symptoms such as hopelessness, fatigue, and reduced interest interfere with cognitive functions like memory and concentration (Feng *et al.*, 2022). Although some evidence in the literature, like Waterhouse & Samra (2025), suggests that mild depression may motivate students to adopt structured study strategies as a form of coping mechanism, the broader trend, however, shows that more severe depression often results in disengagement and poorer performance.

Similarly, the findings regarding anxiety support the existing cross-sectional and meta-analytic literature in linking high anxiety with lower academic performance (Brumariu *et al.*, 2022; Elhaj *et al.*, 2025). Although moderate anxiety may in some cases improve academic performance by enhancing alertness and motivation in a phenomenon referred to as *facilitative anxiety* (Adeoye-Agboola & Evans, 2015), persistent or excessive anxiety tends to hinder learning and examination outcomes. The results on stress further confirm what is in the cross-sectional, meta-analytic, and neuroscience literature: chronic stress decreases cognitive resources, impairs sleep patterns, and reduces motivation, all of which contribute to lower academic performance (Almalki, 2019; Almarzouki, 2024). However, not all stress is harmful in the conceptual literature, as Rudland, Golding, and Wilkinson (2020) indicate that moderate levels of stress can sometimes help students focus and mobilize the mental effort needed to complete tasks. This idea fits with the Yerkes–Dodson law (1908), which suggests that performance improves as arousal increases—but only up to a certain point, after which too much stress becomes harmful (Vu & Boswell, 2021).

The strong positive intercorrelations among anxiety, depression, and stress reinforce the notion that these conditions frequently co-occur (Kircanski *et al.*, 2017). Students experiencing one form of psychological distress are likely to encounter the others, worsening the negative effects on academic performance. As a result, targeted interventions in one area, such as stress management, can have wider benefits by also reducing symptoms of anxiety and depression. To begin applying these insights, universities are suggested to organize psychoeducation workshops aimed at raising awareness about psychological

issues among students and the wider community. These workshops should inform participants about the manifestations of mental health problems and available support services. Regular screening for depression, anxiety, stress, and suicidal thoughts should be conducted, and students identified through these screenings should be promptly guided to counseling services, which should be made free and accessible to all. Regardless, since mental health needs differ for each student, institutions should provide a variety of support options. This could include flexible class schedules to accommodate students' mental health needs, peer support groups to foster a sense of community, and free or affordable housing to reduce financial-related stress. Specialized teams should work to de-stigmatize mental health issues and encourage students to seek help. Additionally, online therapy sessions may be beneficial for students hesitant to meet mental health care providers in person due to stigma.

The present study has many limitations. First, due to the use of a cross-sectional design, it cannot establish causal relationships between psychological distress and academic performance. However, longitudinal studies can provide more insights into how these relationships evolve over time and help establish causality (Caruana *et al.*, 2015). Secondly, the study sample was predominantly female and composed mainly of younger students, limiting the generalizability of results. Broader and more diverse samples in future research would strengthen the findings. Third, the reliance on self-reported subjective measures could be improved by incorporating objective academic measures like GPA or faculty evaluations to enhance validity. In addition, cultural and socioeconomic influences were not examined but may play significant roles in how students experience psychological distress and access support. Finally, future research should consider combining qualitative methods, such as interviews or open-ended questions, with standardized quantitative measures. This approach can provide a deeper understanding of students' personal experiences and perspectives, complementing the numerical data and allowing for more nuanced and actionable insights (Chevalère *et al.*, 2023).

## 5. Conclusion

The present research found that depression, anxiety, and stress are all significantly and negatively associated with lower academic performance among university students. However, given the research limitations, results should be viewed with caution. To manage this outcome, universities should build structured support systems that provide mental health resources within the academic setting. Key approaches

can include regular psychological screenings, accessible counseling services, and academic accommodations for students experiencing one or more conditions of depression, anxiety, and stress.

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## Authorship Contribution

**Mutaz Maawia Osman:** Conceptualization, data collection, and analysis, writing, and editing
**Esraa Abdelrahman Alim:** Final manuscript review.

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## Ethical Approvals

Ethical approval for this study was granted by a duly constituted university research ethics committee, following the principles and standards set out in the British Psychological Society (BPS) guidelines.

## Declarations

The authors declare that they have followed all necessary ethical standards in conducting this research. The study's data cannot be shared publicly because of confidentiality requirements and restrictions set by the ethics committee.

## Conflict of Interest

The authors declare no conflict of interest related to this study.

## Use of Artificial Intelligence and Plagiarism Policy

The authors acknowledge the use of AI-powered tools for preliminary drafting and ideation. However, all content was rigorously reviewed, interpreted, and refined by the authors to ensure scholarly input, originality, and full compliance with ethical and plagiarism standards.

# References

Abdullah, S. F., Ahmad Shah, N., & Mohamad Idaris, R. (2020). Stress and its relationship with the academic performance of higher institution students. *International Journal of Advanced Research in Education and Society*, *2*, 61–73. https://www.scirp.org/reference/referencespapers?referenceid=3738835

Adeoye-Agboola, D. I., & Evans, H. (2015). The relationship between anxiety and academic performance of postgraduate students in Nigeria. *Journal of Education and Practice*, *6*(24), 125–130. https://doi.org/10.11648/j.sjph.20150303.15

Almalki, S. A. (2019). Influence of motivation on academic performance among dental college students. *Open Access Macedonian Journal of Medical Sciences*, *7*(8), 1374–1381. https://doi.org/10.3889/oamjms.2019.319

Almarzouki, A. F. (2024). Stress, working memory, and academic performance: *A neuroscience perspective. Stress*, *27*(1). https://doi.org/10.1080/10253890.2024.2364333

Asif, S., Mudassar, A., Shahzad, T. Z., Raouf, M., & Pervaiz, T. (2020). Frequency of depression, anxiety and stress among university students. *Pakistan Journal of Medical Sciences*, *36*(5), 971–976. https://doi.org/10.12669/pjms.36.5.1873

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice Hall.

Biggs, A., Brough, P., & Drummond, S. (2017). Lazarus and Folkman's psychological stress and coping theory. In G. Fink (Ed.), *The handbook of stress and health: A guide to research and practice* 349–364. Wiley Blackwell. https://doi.org/10.1002/9781118993811.ch21

Birchmeier, C., Levy, S. R., & Gentry, M. (2015). The Academic Performance Scale: Development, validation, and administration. *Journal of Educational Psychology*, *107*(4), 1136–1151.

Brumariu, L. E., Waslin, S. M., Gastelle, M., Kochendorfer, L. B., & Kerns, K. A. (2022). Anxiety, academic achievement, and academic self-concept: Meta-analytic syntheses of their relations across developmental periods. *Development and Psychopathology*, 1–17. https://doi.org/10.1017/S0954579422000323

Caruana, E. J., Roman, M., Hernández-Sánchez, J., & Solli, P. (2015). Longitudinal studies. *Journal of Thoracic Disease*, *7*(11), E537–E540.

Chevalère, J., Cazenave, L., Wollast, R., & Dumont, M. (2023). The influence of socioeconomic status, working memory, and academic self-concept on academic achievement. *European Journal of Psychology of Education*, *38*, 287–309. https://doi.org/10.1007/s10212-022-00599-9

Cho, S., & Hayter, C. S. (2020). Under pressure: A systematic review of stress and its impact among graduate students. *Science and Public Policy*, *47*(6), 758–771. https://doi.org/10.1093/scipol/scaa053

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Depression prevents many of us from leading healthy and productive lives, being the no. 1 cause of ill health and disability worldwide. (2018, May 18). *World Economic Forum*. https://www.weforum.org/stories/2018/05/depression-prevents-many-of-us-from-leading-healthy-and-productive-lives-being-the-no-1-cause-of-ill-health-and-disability-worldwide/

Elhag, H., Hassan, A. A., Alharbi, H. Y., & Adam, I. (2025). Correlation between anxiety scores and academic performance among adolescent schoolchildren in Northern Sudan: A cross-sectional study. *World Journal of Psychiatry*, *15*(7), 107446. https://doi.org/10.5498/wjp.v15.i7.107446

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1–4. https://doi.org/10.11648/j.ajtas.20160501.11

Fathiyah, K. N. (2022). Academic stress and its sources among junior high school students. In *Proceedings of the International Seminar on Innovative and Creative Guidance and Counseling Service* (ICGCS 2021). Atlantis Press. https://doi.org/10.2991/assehr.k.220405.023

Feng, T., Jia, X., Pappas, L., Zheng, X., Shao, T., & Sun, L. (2022). Academic performance and the link with depressive symptoms among rural Han and minority Chinese adolescents. *International Journal of Environmental Research and Public Health*, *19*(10), 6026. https://doi.org/10.3390/ijerph19106026

Govindaraju, V. (2021). A review of social cognitive theory from the perspective of interpersonal communication. *Multicultural Education*, *7*(12), 488–492. http://dx.doi.org/10.5281/zenodo.5802235

Iqra. (2024). A systematic review of academic stress intended to improve the educational journey of learners. *Methods in Psychology*, *11*, 100163. https://doi.org/10.1016/j.metip.2024.100163

Kamruzzaman, M., Hossain, A., Islam, M. A., Ahmed, M. S., Kabir, E., & Khan, M. N. (2024). Exploring the prevalence of depression, anxiety, and stress among university students in Bangladesh and their determinants. *Clinical Epidemiology and Global Health*, *28*, 101677. https://doi.org/10.1016/j.cegh.2024.101677

Kassab, S. E., Rathan, R., Taylor, D. C. M., & Hamdy, H. (2024). The impact of the educational environment on student engagement and academic performance in health professions education. *BMC Medical Education*, *24*, 1278. https://doi.org/10.1186/s12909-024-06270-9

Kircanski, K., LeMoult, J., Ordaz, S., & Gotlib, I. H. (2017). Investigating the nature of co-occurring depression and anxiety: Comparing diagnostic and dimensional research approaches. *Journal of Affective Disorders*, *216*, 123–135. https://doi.org/10.1016/j.jad.2016.08.006

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer Publishing Company.

Lovibond, S. H., & Lovibond, P. F. (1995). *Depression Anxiety Stress Scales* (DASS-21, DASS-42). APA PsycTests. https://doi.org/10.1037/t01004-000

Mofatteh, M. (2020). Risk factors associated with stress, anxiety, and depression among university undergraduate students. *AIMS Public Health*, *8*(1), 36–65. https://doi.org/10.3934/publichealth.2021004

Park, Y. S., Konge, L., & Artino, A. R., Jr. (2020). The positivism paradigm of research. *Academic Medicine*, *95*(5), 690–694. https://doi.org/10.1097/ACM.0000000000003093

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: Mental health problems and treatment considerations. A*cademic Psychiatry*, *39*(5), 503–511. https://doi.org/10.1007/s40596-014-0205-9

Pérez-Jorge, D., Boutaba-Alehyan, M., González-Contreras, A. I., et al. (2025). Examining the effects of academic stress on student well-being in higher education. *Humanities and Social Sciences Communications*, *12*, 449. https://doi.org/10.1057/s41599-025-04698-y

Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders*, *148*(1), 1–11. https://doi.org/10.1016/j.jad.2012.11.026

Roldán-Espínola, L., Riera-Serra, P., Roca, M., et al. (2024). Depression and lifestyle among university students: A one-year follow-up study. *European Journal of Psychiatry*, *38*(3), Article 100250. https://doi.org/10.1016/j.ejpsy.2024.100250

Rudland, J. R., Golding, C., & Wilkinson, T. J. (2020). The stress paradox: How stress can be good for learning. *Medical Education*, *54*(1), 40–45. https://doi.org/10.1111/medu.13830

Sheldon, E., Simmonds-Buckley, M., Bone, C., et al. (2021). Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. *Journal of Affective Disorders*, *287*, 282–292. https://doi.org/10.1016/j.jad.2021.03.054

Vu, T., & Boswell, S. S. (2021). Revisiting the Yerkes–Dodson law: Moderate stress as a catalyst for student performance. *Educational Psychology Review*, *33*(1), 123–139.

Waterhouse, P., & Samra, R. (2025). University students' coping strategies to manage stress: A scoping review. Educational Review. Advance online publication. https://doi.org/10.1080/00131911.2024.2438888

Yan, R., Jin, S., Ji, C., et al. (2024). Depression takes a toll on academic performance: Evidence from rural students in China. *Risk Management and Healthcare Policy*, *17*, 2209–2227. https://doi.org/10.2147/RMHP.S469836

Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. J*ournal of Comparative Neurology and Psychology*, *18*, 459–482. http://dx.doi.org/10.1002/cne.920180503