

Exploring Relationship Between Academic Anxiety and Depression Among Undergraduate College Students

Original Research

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Abstract

Introduction: Academic anxiety and depression are prevalent mental health challenges among college students, often impacting both personal well-being and academic performance. This study explored the relationship between academic anxiety and depression among undergraduate students enrolled in a health course at a university in Southeastern United States.

Methods: A total of students participated, completing the Academic Anxiety Scale (AAS) and the Center for Epidemiologic Studies Depression Scale (CES-D), at both the beginning and end of the semester. Intervention components consisted of activities, discussions and assessments (quizzes) on goal setting, stress coping mechanisms, time management skills, sleep score, resiliency and psychological wellness. Descriptive and inferential statistical analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS) version 29.0.1.0 (171) to examine correlations between academic anxiety, depressive symptoms, and academic performance pre- and post-intervention. We hypothesized that higher levels of academic anxiety at the beginning of the semester would correlate with increased depressive symptoms by semester's end.

Results: Study results showed strong statistical evidence that the course positively impacted the number of depressed students. Pre-semester moderate/high anxiety significantly decreased the odds of being not depressed, $Wald \chi^2(1) = 4.27, p = .039$, odds ratio (OR) = 0.12. Post-semester moderate/high anxiety showed a marginal effect, $Wald \chi^2(1) = 3.66, p = .056$, OR = 0.10.

Conclusions: These results emphasize the need for addressing academic anxiety, as it can contribute to depressive symptoms. The results underscore the importance of enhancing mental health resources and interventions, to better support students in managing anxiety and depression within academic settings. Further research with a larger sample size and more variables is recommended to confirm these results.

Key Words: academic anxiety, depression, college students

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Introduction

Academic anxiety and depression have emerged as two of the most significant mental health challenges facing college students today, with far-reaching implications for both psychological well-being and academic success (Kahn et al., 2018). As the demands of higher education intensify, these issues have garnered increasing attention from researchers, educators, and policymakers. College students are frequently confronted with a complex array of stressors—including rigorous academic expectations, social adjustments, and developmental pressures—that can precipitate or exacerbate symptoms of anxiety and depression (Watson et al., 2018).

The impact of these mental health conditions extends beyond emotional distress, influencing students' academic outcomes, retention rates, and overall college experiences (Smith & Zhang, 2020). According to Blanco, Saha, and Rios (2023), mental health concerns such as anxiety and depression are closely intertwined with academic challenges, positioning them as urgent priorities for institutional intervention.

Among these concerns, academic anxiety has proven particularly detrimental. It disrupts key cognitive processes—such as attention, memory, and executive functioning—while also impairing emotional regulation and overall student engagement (Lin et al., 2025). As academic environments grow increasingly competitive, many students find themselves ill-equipped to manage the escalating demands of coursework, examinations, and extracurricular commitments. Götz, Schneider, and Haslam (2020), reported that nearly 40% of university students experience significant academic anxiety, which contributes to lower academic achievement, heightened stress, and reduced quality of life.

Likewise, Liu et al. (2021) found that approximately 35% of college students meet the diagnostic criteria for depression, with academic pressure identified as a major contributing factor. Owens, White, and Barlow (2022) further demonstrated that academic anxiety significantly impairs students' ability to concentrate during exams, complete assignments, and engage effectively in lectures—often resulting in a marked decline in performance. Chu (2023) adds that depression, often co-occurring with anxiety, exacerbates these cognitive impairments and creates a self-perpetuating cycle of poor mental health and diminished academic functioning.

The purpose of this study was to examine the relationship between academic anxiety levels and depression status among college students, with a focus on changes from the beginning to the end of the semester. The findings provide important insights into how anxiety influences mental health outcomes in academic settings.

Scientific Methods

Participants

At the beginning of the semester, 27 students completed the pretest but only 24 ($n=24$) completed the both the pre and posttests. To participate in the study, participants had to be enrolled in the sixteen-week's course. An email was sent out to the students explain the purpose of the study. Student were informed that participation was voluntary. Survey instruments were completed anonymously via Qualtrics XM survey system. Participants in the study were aged between 18 to 24 years and included both male and female students from a range of academic disciplines. These fields included biological middle school education, engineering, psychology, business, and other general studies, which allowed for a diverse representation of the student body. This demographic variability was intended to provide insight into whether academic anxiety and depression manifested differently across different academic backgrounds.

This study employed a quantitative, quasi-experimental pretest-posttest design to examine changes in academic anxiety and depressive symptoms among college students over the course of a semester. The primary objective was to assess whether participation in a health-focused college course influenced students' psychological well-being.

Protocol

Before participating, all students were fully informed of the purpose of the study, and their informed consent was obtained to ensure that they understood the voluntary nature of the study and the measures in place to protect their confidentiality. This consent process helped ensure ethical compliance and transparency, adhering to research standards. Although the sample size of 27 was relatively small, it was adequate for preliminary analysis of the relationship between academic anxiety and depression. Participants were recruited during the first week of the semester through classroom announcements and provided informed consent prior to participation. All data were anonymized, and the study protocol was approved by the university's Institutional Review Board (IRB).

To assess academic anxiety and depressive symptoms, participants completed two well-established instruments at the beginning and at the end of the semester. Academic anxiety was measured using the Academic Anxiety Scale (AAS) developed by Cassady (2003). The AAS has demonstrated strong internal consistency and construct validity in previous research involving college student populations, making it a reliable tool for evaluating academic anxiety in higher education setting (Thomas et al.; 2018).

Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), a 20-item instrument that evaluates the frequency of depressive symptoms experienced over the past week.

Items reflect common symptoms of depression, including sadness, loss of interest or pleasure in activities, fatigue, and difficulty concentrating. Respondents rated the frequency of each symptom on a 4-point Likert scale ranging from 0 (“Rarely or none of the time”) to 3 (“Most or all of the time”), resulting in a total score ranging from 0 to 60. A score of 16 or above is typically used as a threshold indicating the presence of clinically significant depressive symptoms (Radloff, 1977; Lewinsohn et al., 1911; Eaton et al. 2024).

Statistical Analysis

All statistical analyses were conducted using version SPSS 29.0.1.0 (171). To examine the predictive relationship between academic anxiety at the beginning of the semester and depressive symptoms at the end of the semester, a binary logistic regression analysis was conducted. The dependent variable was depression status, coded as 0 = *Depressed* and 1 = *Not Depressed*.

This approach was selected to assess whether pre-semester academic anxiety (measured by AAS) significantly predicted the likelihood of elevated depressive symptoms at semester’s end (measured by CES-D). For this analysis, CES-D scores were dichotomized using the established clinical cutoff score of 16, with scores ≥ 16 indicating the presence of clinically relevant depressive symptoms. To evaluate changes in students’ anxiety levels over the course of the semester, a McNemar-Bowker test was performed, comparing the distribution of participants across four predefined anxiety categories at both pre-course and post-course assessments.

Results

Out of the 27 participants, 24 completed both the pre and posttests (anxiety and depression) at the beginning of the semester. There were 11 male students and 16 enrolled in the course. All class levels were represented in this study as indicated in Table 1.

Table 1. Descriptive statistics of demographic variables.

Variable	N (%)
Gender (n=27)	
Male	11 (40.7%)
Female	16 (59.3%)
Academic Level	
Freshman	5 (18.5%)
Sophomore	5 (18. 5%)
Junior	12 (44.4%)
Senior	3 (11 %)
Unclassified	2 (7.2%)

Academic anxiety levels were assessed before and after the semester. Pre-semester, 12.5% of students reported no anxiety, 37.5% reported mild anxiety, 33.3% reported moderate anxiety, and 16.7% reported severe anxiety. Post-semester, the percentage of students reporting no anxiety increased slightly to 16.7%, while mild anxiety decreased to 33.3%. Moderate anxiety declined to 29.2%, and severe anxiety increased to 20.8%. These results suggest that the course did not produce a measurable impact on reducing anxiety when categorized more broadly. (see table 2).

Table 2. Distribution of Academic Anxiety Levels Pre-and Post-Semester (N=24).

Anxiety Level	Pre-Semester	Post-Semester
None	3 (12.5%)	4 (16.7%)
Mild	9 (37.5%)	8 (33.3%)
Moderate	8 (33.3%)	7 (29.2%)
Severe	4 (16.7%)	5 (20.8%)

Table 3 outlines two binary logistic regression models examining the predictive effect of academic anxiety on the likelihood of being classified as not depressed.

In Model 1, pre-intervention academic anxiety was a significant predictor of depression status, Wald $\chi^2(1) = 4.27, p = .039$. Students reporting moderate to high levels of anxiety at baseline had significantly lower odds of being not depressed compared to their low-anxiety peers (OR = 0.123), reflecting an 88% decrease in likelihood. The constant for Model 1 was not statistically significant.

Model 2, based on post-intervention anxiety levels, approached statistical significance, Wald $\chi^2(1) = 3.66, p = .056$. While the result did not meet the conventional significance threshold, it suggested a meaningful trend: students with moderate to high post-intervention anxiety were 90% less likely to be classified as not depressed (OR = 0.10). The constant in this model was statistically significant ($B = 2.485, SE = 1.041, p = .017$), indicating a strong baseline probability of being not depressed among students with low levels of anxiety following the intervention.

Table 3. Binary Logistic Regression.

Predictor	B	SE	Wald	df	p	Exp(B)
Model 1: Pre-Anxiety						
PreAnx Mod/High	-2.095	1.013	4.27	1	.039	0.123
Constant	0.223	0.671	0.11	1	.739	1.250
Model 2: Post-Anxiety						
PostAnx Mod/High	-2.303	1.204	3.66	1	.056	0.100
Constant	2.485	1.041	5.70	1	.017	12.000

Discussion

The purpose of this study was to examine the relationship between academic anxiety and depression among undergraduate students enrolled in a health-focused course, assessing changes in these variables over the semester and evaluating the potential impact of course-based mental health interventions. The findings offer a nuanced understanding of how academic anxiety and depressive symptoms interact in a university setting and how structured health education may influence these mental health outcomes.

The results of this study offer important insights into the relationship between academic anxiety and depressive symptoms among college students. Logistic regression analyses demonstrated that pre-semester academic anxiety significantly predicted pre-semester depression levels, aligning with prior research that has established a close association between anxiety and depression among college students (Owens, White, & Barlow, 2022; Liu et al., 2021). A p -value of .056 suggests a trend toward significance and may indicate that with a larger sample size or reduced variance, the effect would likely reach significance.

Although academic anxiety remained relatively stable from pre-to post-course regardless of whether scores were evaluated continuously, categorized into four levels, or dichotomized there was a statistically significant reduction in depressive symptoms over the course of the semester. This suggests that while the health course may not have had a measurable impact on anxiety levels, it may have provided meaningful support in reducing symptoms of depression. This pattern of results aligns with prior studies indicating that depression may be more responsive to psychoeducational interventions than anxiety, particularly when those interventions incorporate wellness strategies, stress reduction techniques, and mental health literacy (Panicker & Sachdev, 2019; Zhang et al., 2019).

Limitations

A major limitation of the study is the relatively small sample size ($n = 24$). This small sample size can raise concerns about the generalizability of the findings, particularly when making conclusions about the broader student population. Although the sample size was adequate for preliminary analysis and uncovering initial trends, a larger sample would allow for more robust statistical analyses and increase the external validity of the results. The sample consists of students from a single course at one university, limiting the diversity of the student body in terms of demographic characteristics. The study acknowledges the presence of data separation issues in the logistic regression models, which may affect the accuracy of the results. The study also relied on self-reported measures of anxiety and depression, which may be subject to response bias. Additionally, the binary classification of anxiety and depression simplifies what are inherently dimensional constructs, potentially obscuring more nuanced relationships. Finally, the pilot study design limits the ability to draw causal inferences from the observed associations.

Conclusions

This study examined the impact of a college health course on academic anxiety and depression among undergraduate students. While no significant change was observed in anxiety levels over the semester, a statistically significant reduction in depressive symptoms was found. The limited sample size, particularly the small number of participants reporting depressive symptoms post-intervention may account for results that approached but did not reach significance. These results suggest that while course-based interventions may positively influence emotional well-being, they may require additional components or target strategies to effectively address anxiety-related concerns. The integration of mental health education into academic curricula holds promise as a scalable and accessible approach to promoting psychological resilience among students. Conversely, these findings raise a nuanced point about how depression and anxiety may respond differently to brief, course-based interventions. While the intervention (a semester-long health-focused course) may have been sufficient to produce observable changes in depressive symptoms, academic anxiety often reflects more entrenched cognitive-behavioral patterns and may be less responsive to short-term interventions. Future research should explore intervention duration and content more explicitly, using larger, diverse samples. A better understanding of these dynamics could inform campus-based prevention and support programs, especially for students at higher risk due to academic stress. As institutions of higher education face increasing demands to support student well-being, evidence-based, curriculum-integrated interventions represent a critical step toward fostering healthier and more supportive learning environments.

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