

The Moderating Role of Financial Problems in the Relationship between Perceived Academic Performance and Perceived Stress among University Students

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ABSTRACT

This study examines whether financial problems moderate the relationship between perceived academic performance and perceived stress among undergraduate students in Malaysian public universities. Guided by the Transactional Model of Stress and Coping and Conservation of Resources Theory, the study employed a cross-sectional quantitative survey design. Data were collected through an online questionnaire from 677 undergraduate students enrolled in 20 Malaysian public universities using convenience sampling. Perceived stress, perceived academic performance, and financial problems were measured using five-item scales, while self-reported CGPA was included as a control variable. Data were analysed using IBM SPSS Statistics 30.0 through descriptive statistics, reliability analysis, Pearson correlation, and multiple regression with an interaction term. In the initial regression model, financial problems were positively associated with perceived stress ($B = 0.196, p < 0.001$), whereas perceived academic performance was not significant ($B = -0.049, p = 0.235$). In the moderation model, financial problem and perceived academic performance scores were interpreted using mean-centered predictors. At the mean level of perceived academic performance, financial problems remained a significant positive predictor of perceived stress ($B = 0.191, p < 0.001$), whereas perceived academic performance was not significant at the mean level of financial problems ($B = -0.049, p = 0.458$). The interaction between financial problems and perceived academic performance remained positive but did not reach the conventional 0.05 significance level ($B = 0.080, p = 0.051$). Thus, the study does not provide sufficient statistical evidence to confirm a moderation effect.

Keywords: Perceived stress, perceived academic performance, financial problems, stress appraisal, moderation analysis

INTRODUCTION

Background

The university years are often portrayed as a period of opportunity, growth, and self-discovery. Yet, for many students, this developmental stage is equally characterized by substantial psychological pressure. Academic demands intensify, expectations from family and society become more pronounced, and concerns about future employability grow increasingly salient. Within this environment, academic performance extends beyond a simple measure of achievement; it becomes closely tied to students' perceived competence, stability, and long-term aspirations. It is therefore unsurprising that fluctuations in academic performance are frequently associated with variations in perceived stress (Pascoe et al., 2020).

In Malaysia, student mental health has emerged as an escalating concern. National reports indicate a marked rise in psychological distress among young adults (Hassan et al., 2018), with university students identified as particularly vulnerable (Hamzah et al., 2019). Empirical studies consistently document considerable levels of stress, anxiety, and depressive symptoms across academic disciplines (Fauzi et al., 2021). These findings

suggest that the university environment may amplify psychological strain, particularly when students face multiple and overlapping stressors.

Among these stressors, financial difficulty has received growing attention. Rising tuition fees, increasing living expenses, and broader economic uncertainty mean that many students navigate university life under persistent financial pressure. Research consistently links financial strain with elevated psychological distress and diminished well-being (Jones et al., 2020; Dawson & Pooley, 2022). Importantly, financial problems may alter the psychological meaning of academic outcomes. For students experiencing economic hardship, academic setbacks may not merely represent academic disappointment but may also threaten financial investment, scholarship eligibility, and perceived upward mobility.

From a theoretical perspective, the Transactional Model of Stress (Lazarus & Folkman, 1984) posits that stress arises from individuals' appraisal of environmental demands relative to their perceived coping resources. Financial strain may constrain perceived coping capacity, thereby intensifying emotional responses to academic challenges. In this way, financial problems may function not only as an independent stressor but also as a contextual condition that shapes how academic performance translates into perceived stress.

Although prior research has established separate associations between academic performance and stress, as well as between financial strain and psychological distress, far less attention has been given to how these factors operate jointly. Students who achieve similar academic outcomes may nevertheless experience markedly different levels of stress depending on their financial circumstances. This conditional dynamic remains underexplored, particularly within the Malaysian higher education context.

Accordingly, the present study investigates whether financial problems moderate the relationship between academic performance and perceived stress among university students. By examining this interaction, the study seeks to provide a more nuanced understanding of student stress and inform institutional strategies that are sensitive to students' socioeconomic realities.

LITERATURE REVIEW

Perceived Stress among University Students

Perceived stress is a major psychological concern among university students and is widely recognized as a key determinant of academic functioning and overall well-being. According to stress appraisal theory, perceived stress occurs when individuals interpret environmental demands as exceeding their coping resources. In higher education contexts, students commonly experience stress due to academic workload, examinations, financial constraints, and social pressures (Javaid et al., 2024). These stressors contribute to emotional exhaustion, cognitive overload, and reduced academic effectiveness. Studies indicate that perceived stress negatively influences attention, concentration, and motivation, which ultimately hinder academic performance (Ma, 2025).

Research consistently shows that perceived stress is strongly associated with poor mental health outcomes among university students. High stress levels are linked to anxiety, depression, and decreased academic engagement (Zhang et al., 2024). Similarly, nursing education research indicates that prolonged stress functions as a psychosocial barrier to learning, impairing students' cognitive functioning and academic success (Mazalova et al., 2022). Academic stressors such as heavy workload, high expectations, and competitive learning environments further contribute to students' psychological strain (Ni et al., 2024). These findings highlight perceived stress as an important dependent variable in higher education research.

Perceived stress refers to an individual's evaluation of situations as overwhelming or exceeding their coping capacity. It is shaped by personal appraisal processes and available coping resources rather than objective stressors alone. Among university students, perceived stress is highly prevalent due to academic pressures, life transitions, and increasing independence. Students often face new responsibilities, including financial management and academic demands, which contribute significantly to stress levels (Khoo & Farah, 2021).

The transition to university life is a critical developmental stage marked by increased responsibilities and

expectations. This period exposes students to multiple stressors such as academic workload, personal relationships, and financial challenges. Consequently, perceived stress has become a major concern because it can negatively influence students' psychological well-being, academic success, and life satisfaction (Rani et al., 2025).

Research also indicates that perceived stress is influenced by both environmental and individual factors. Academic pressures, socio-economic conditions, and personal coping abilities collectively determine how students perceive and respond to stress (Al-Roomy, 2026).

Academic Performance and Perceived Stress

Perceived academic performance is closely related to students' psychological well-being and plays a critical role in determining stress levels. Empirical research consistently demonstrates a negative relationship between perceived academic performance and perceived stress. High stress levels can impair cognitive processes such as working memory, attention, and decision-making, which are essential for academic success (Ma, 2025). Cognitive Load Theory explains that stress increases extraneous cognitive load, reducing students' ability to process academic information effectively (Asare, 2026).

Studies also show that academic stress contributes to maladaptive behaviours such as procrastination, disengagement, and decreased academic motivation (Wang et al., 2025). Research among engineering and first-year university students confirms that stress significantly predicts lower academic achievement and reduced academic persistence (Tormon et al., 2023). Furthermore, academic anxiety related to examinations has been found to negatively affect academic performance due to its impact on working memory and emotional regulation (Asare, 2026). These findings confirm that academic performance is an important predictor of perceived stress among university students.

Academic performance is widely recognized as an important predictor of perceived stress among university students. Numerous studies have consistently found a negative relationship between academic performance and stress levels. Students experiencing high levels of perceived stress tend to demonstrate lower academic achievement, reduced concentration, and poor academic outcomes (Talib & Zia-ur-Rehman, 2012).

High academic demands, heavy course loads, and performance expectations contribute significantly to students' stress levels. When students perceive academic requirements as exceeding their coping capacity, stress increases, which can further impair academic performance. This cyclical relationship suggests that academic performance and perceived stress are closely interconnected (Al-Roomy, 2026).

Furthermore, previous research highlights that academic stressors such as examinations, deadlines, and competitive environments are among the most common sources of stress among university students. Poor academic performance can also intensify stress due to fear of failure and future career concerns (Khoo & Farah, 2021). Lower academic achievement increases cognitive load and anxiety, while higher performance acts as a psychological buffer, thereby reducing perceived stress levels (Ma, 2025; Asare, 2026). Therefore, based on the above discussion and consistent with prior studies, this study hypothesizes that:

H1: Perceived academic performance has a significant negative effect on perceived stress among university students.

Financial Problems and Student Stress

Financial problems are widely recognized as one of the most significant external stressors affecting university students. Financial strain may arise from tuition fees, living expenses, and limited financial resources (Javaid et al., 2024). Students experiencing financial hardship often report higher levels of anxiety, psychological distress, and academic difficulties (Zhang et al., 2024). Financial challenges can also negatively affect academic engagement by increasing worry and reducing students' ability to focus on learning tasks (Masnan et al., 2025).

Research further suggests that financial stress functions as a secondary stressor that can persist over time and

contribute to chronic psychological strain. Secondary stressors such as financial insecurity can continuously deplete emotional and cognitive resources, thereby increasing perceived stress levels (Ntontis et al., 2023). Financial difficulties have also been identified as common stressors among nursing students and other professional program students (Mazalová et al., 2022). These findings emphasize the importance of financial problems as a contextual factor influencing students' stress experiences.

Financial problems represent one of the most significant stressors affecting university students. Financial distress is defined as perceived economic hardship and lack of financial support, which can result in psychological strain and reduced well-being. Studies have shown that students experiencing financial difficulties report higher levels of perceived stress compared to financially stable students (Khoo & Farah, 2021).

Rising tuition fees, living expenses, and limited financial resources contribute to financial strain among university students. Financial stress is strongly associated with mental health issues such as anxiety, depression, and reduced life satisfaction, highlighting its importance as a critical factor influencing perceived stress (Rani et al., 2025).

Moreover, financial challenges can affect students' academic engagement by increasing worry, reducing concentration, and limiting access to academic resources. Consequently, financial problems not only increase perceived stress directly but also indirectly influence academic outcomes (Khoo & Farah, 2021). Following COR theory (Rani et al., 2025), financial strain represents a primary loss of resources. The literature (Javaid et al., 2024; Khoo & Farah, 2021) consistently shows that tuition and living expense pressures directly elevate psychological distress. Therefore, in relation to financial problem, the discussion above leads to the following hypothesis:

H2: Financial problems have a significant positive effect on perceived stress among university students.

Moderating Role of Financial Problems

Financial problems not only directly influence perceived stress but also play a moderating role in the relationship between academic factors and stress. According to Conservation of Resources (COR) theory, stress arises when individuals experience resource loss or perceive threats to their resources. Financial strain represents a significant resource loss that weakens students' coping abilities and increases vulnerability to stress (Rani et al., 2025).

Empirical evidence indicates that financial stress can weaken protective factors such as social support while simultaneously increasing psychological distress. For instance, Rani et al. (2025) found that financial strain moderates the relationship between family support and perceived stress, such that high financial stress reduces the buffering effect of social support. Similarly, financial difficulties can intensify academic stress by increasing anxiety and limiting coping resources (Ntontis et al., 2023). Therefore, financial problems serve as an important moderating variable that strengthens the negative relationship between academic performance and perceived stress among university students.

Although previous studies have established that perceived stress negatively affects academic performance, most research has focused on direct relationships without considering contextual factors that may influence this association. Financial problems are widely recognized as major stressors among university students, yet they are typically examined as independent predictors rather than moderating variables. Limited research has explored how financial strain alters the relationship between academic performance and perceived stress. Furthermore, existing studies often focus on specific student groups and lack integration of financial stress within theoretical stress frameworks. Therefore, this study addresses this gap by investigating the moderating role of financial problems in the relationship between academic performance and perceived stress among university students.

Financial problems can act as a moderating variable in the relationship between academic performance and perceived stress. According to stress and coping theory, stress occurs when individuals perceive demands as exceeding available resources. Financial difficulties reduce available resources, thereby intensifying the impact

of academic challenges on perceived stress (Rani et al., 2025).

Research indicates that financial stress weakens protective factors such as family support and coping mechanisms. Students experiencing high financial strain tend to report stronger relationships between academic stressors and perceived stress compared to those with lower financial difficulties. This suggests that financial problems amplify the negative effects of academic challenges on students' stress levels (Rani et al., 2025). Additionally, financial problems can reduce students' ability to cope effectively with academic pressures. Limited financial resources may lead to increased workload, part-time employment, and reduced study time, which further heighten stress levels (Khoo & Farah, 2021). The strength of the relationship between a student's academic success and their stress levels is contingent upon their financial status. Specifically, for students facing financial difficulties, the negative impact of academic performance on stress is expected to be more pronounced, as they lack the financial "cushion" to mitigate academic setbacks. As such, based on the active monitoring hypothesis notion, and, in relation to moderating role of financial problem, it is hypothesized that:

H3: Financial problems moderate the relationship between perceived academic performance and perceived stress, such that the association varies across levels of financial strain.

Theoretical Support for the Moderation Model

Several theories support the moderating role of financial problems in stress relationships. The stress and coping theory suggests that stress arises from an imbalance between demands and coping resources. Financial strain reduces coping resources, increasing vulnerability to stress (Rani et al., 2025).

Similarly, conservation of resources theory explains that stress occurs when individuals experience resource loss or threat of loss. Financial difficulties represent a loss of essential resources, which intensifies the impact of academic challenges on perceived stress (Rani et al., 2025).

RESEARCH GAP

Although previous studies have consistently shown that academic performance is related to perceived stress, and separately demonstrated that financial strain contributes to psychological distress, far less attention has been given to how these factors operate together. Most research examines financial problems as a direct predictor of stress, without considering whether financial circumstances may shape how students respond to academic outcomes.

As a result, it remains unclear whether the psychological impact of academic performance is the same for all students. Two students with similar academic results may experience very different levels of stress depending on their financial situation. This possibility has received limited empirical attention, particularly within the Malaysian higher education context, where students come from diverse socioeconomic backgrounds. By not accounting for financial differences, previous research may overlook important variations in students' stress experiences.

THEORETICAL FRAMEWORK

This study draws on the Transactional Model of Stress (Lazarus & Folkman, 1984) and Conservation of Resources (COR) Theory (Hobfoll, 1989) to explain how academic and financial factors shape students' stress experiences. The Transactional Model suggests that stress does not arise simply from external events, but from how individuals evaluate those events in relation to their available coping resources. In the university setting, academic performance can represent a significant demand, particularly when it is closely tied to students' goals and future aspirations.

At the same time, COR theory emphasizes that stress becomes more intense when individuals experience resource limitations or resource loss. Financial problems may reduce students' sense of security and coping capacity, making academic challenges feel more overwhelming.

In this way, financial strain may not only contribute directly to stress but may also influence how strongly academic performance affects perceived stress. Accordingly, financial problems are conceptualized as a moderating variable in this relationship.

The proposed framework is illustrated in Figure 1.

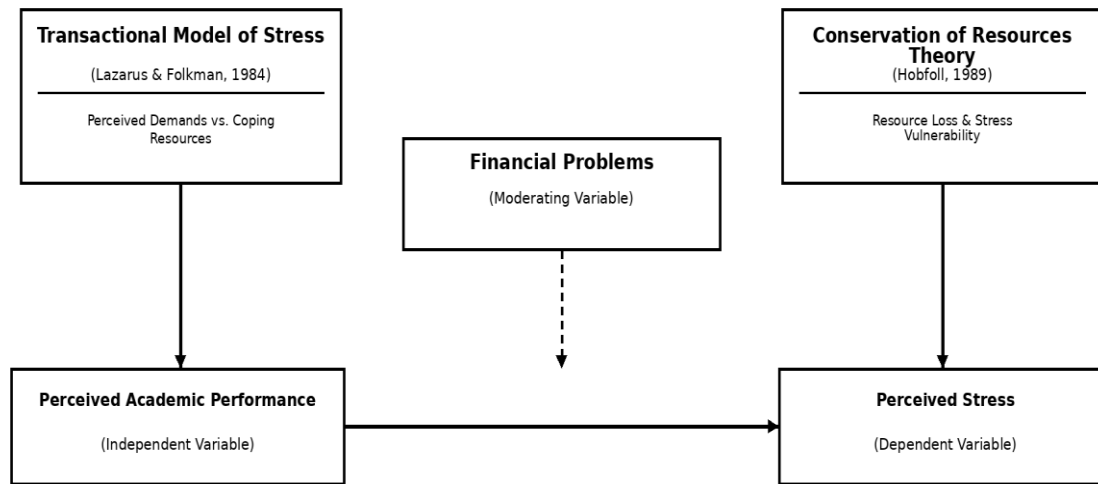


Figure 1. Theoretical framework illustrating the moderating role of financial problems in the relationship between perceived academic performance and perceived stress.

HYPOTHESES

Based on the preceding theoretical discussion, the present study proposes the following hypotheses:

H1: Perceived academic performance has a significant negative effect on perceived stress among university students.

H2: Financial problems have a significant positive effect on perceived stress among university students.

H3: Financial problems moderate the relationship between perceived academic performance and perceived stress, such that the association varies across levels of financial strain.

MATERIALS AND METHODS

Research Design

This study employed a cross-sectional quantitative survey design to examine the moderating role of financial problems in the relationship between academic performance and perceived stress among students in Malaysian public universities. A quantitative approach was deemed appropriate as the study aimed to test hypothesized relationships and interaction effects among measurable variables.

The study was grounded in the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984) and Conservation of Resources (COR) Theory (Hobfoll, 1989), which posit that stress arises when individuals perceive demands as exceeding available resources. Financial problems were conceptualized as a contextual resource constraint that may intensify the relationship between academic performance and perceived stress.

Participants and Sampling

This research adopted a convenience sampling technique, focusing on undergraduate students studying in

public universities across Malaysia. The sampling frame was meticulously crafted using the Directory of Public Universities published by the Department of Higher Education Malaysia, ensuring that the data collection targeted a relevant and credible group. Questionnaires were distributed to students in 20 public universities, aiming to gather insights from a diverse yet accessible segment of the student population. This approach intended to represent the broader undergraduate community, which comprised 551,082 individuals at the time. While convenience sampling allowed for quicker and easier data collection, it also introduced potential biases, as the selection of participants depended heavily on accessibility and willingness to participate. Consequently, the results might not fully capture the diversity within the entire student body, potentially limiting the generalizability of the findings. Nonetheless, by leveraging the established directory, the study ensured that it engaged a substantial and relevant cross-section of Malaysian undergraduates.

Survey invitations were disseminated through WhatsApp, with the questionnaire hosted on a secured online platform to safeguard data integrity. Participation was restricted to eligible respondents by requiring access through verified university email addresses and completing an identity verification process. In the end, 677 students voluntarily participated in the survey, and their responses were deemed valid for inclusion in the subsequent data analysis.

This sampling strategy was selected to align with the research objective of examining the academic experiences of Malaysian undergraduates within their unique cultural and educational framework. The sample size of 677 participants allowed for comprehensive analysis, though the findings may not be broadly applicable to other groups.

Data Collection Instruments

Demographic Variables and Control Variable

The first section of the questionnaire collected demographic information, including gender, year of study, and race. These variables were included to provide a descriptive profile of the sample and were controlled for in the regression analysis to account for potential demographic influences on perceived stress. Academic performance was assessed using students' self-reported Cumulative Grade Point Average (CGPA), ranging from 0.00 to 4.00, consistent with the grading system used in Malaysian public universities. Although CGPA was not the primary independent variable in this study, it was included as a control variable to account for objective academic standing. While self-reported CGPA may be subject to minor reporting inaccuracies, prior research suggests strong correlations between self-reported and official GPA records. Nonetheless, this limitation is acknowledged.

Perceived Stress (Dependent Variable)

Perceived stress was measured using a five-item scale assessing the frequency of stress-related experiences, such as feeling upset due to unexpected events, unable to control important things in life, nervous or stressed, unconfident in ability to handle personal problems, and feeling things were not going according to plan. Participants responded using a 5-point Likert scale ranging from 1 (Never) to 5 (Very Often). Higher scores indicated higher levels of perceived stress. The internal consistency reliability of the scale was acceptable (Cronbach's $\alpha = 0.861$).

Perceived Academic Performance (Independent Variable)

Perceived academic performance was measured using a five-item scale assessing students' opinion on factors influencing their academic performance. The items captured performance in the most recent examination, achievement of academic goals, satisfaction with academic progress, ability to meet coursework expectations, and perceived academic competence.

Responses were rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Higher scores indicated more positive perceived academic performance. Perceived academic performance was selected as the independent variable because stress appraisal is influenced not only by objective achievement but also by individuals' subjective evaluation of their academic capability. This conceptualization aligns with

the Transactional Model of Stress, which emphasizes cognitive appraisal processes. The scale demonstrated satisfactory internal consistency in the present study (Cronbach's $\alpha = 0.802$).

Financial Problems (Moderating Variable)

Financial problems were measured using a five-item scale assessing students' opinion on factors influencing students' financial problems. The items evaluated include no excess of money to make saving, reliance on borrowing or debt to cover living expenses, adequacy of emergency savings, purchasing power, and ability to focus on lessons due to financial problems.

Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), with higher scores reflecting greater financial problems. Financial problems were conceptualized as a contextual stressor that may alter the strength or direction of the relationship between perceived academic performance and perceived stress. This conceptualization is grounded in Conservation of Resources (COR) theory, which posits that limited financial resources can intensify stress responses. The scale demonstrated satisfactory reliability (Cronbach's $\alpha = 0.792$).

Procedure and Ethics

To ensure the accuracy of the data and adherence to ethical research standards, several stringent quality assurance procedures were implemented. Attention-check items were embedded within the online questionnaire to detect inattentive or random responses, thereby improving the credibility and reliability of the dataset. These checks helped minimize careless answering and strengthened overall data validity.

In addition to safeguarding data quality, particular emphasis was placed on protecting participants' privacy and confidentiality. Prior to participation, respondents were required to provide informed electronic consent. The consent form clearly explained the purpose of the study, the voluntary nature of participation, and the participants' right to withdraw at any point without penalty. Providing this information ensured transparency and supported ethical responsibility throughout the research process.

The study was conducted in accordance with the ethical principles articulated in the Statement of Ethical Practice (2017) by the British Sociological Association, which underscores respect for participant welfare, autonomy, and data protection. Compliance with these established ethical standards strengthened the integrity of the research and promoted trust between the researchers and participants.

Despite these precautions, certain ethical limitations inherent in online survey research remained. These included the possibility of self-report bias, potential misunderstanding of consent information, and challenges associated with verifying participant identity in a digital environment. Nevertheless, through the implementation of systematic data screening procedures, robust confidentiality safeguards, and adherence to recognized ethical frameworks, the study upheld a high level of research integrity and participant protection.

Data Analysis

Data were analyzed using IBM SPSS Statistics version 30.0.0.0. Descriptive statistics, including mean, standard deviation, skewness, kurtosis, and percentiles, were calculated to provide an overview of the dataset. For the moderation analysis, financial problem and perceived academic performance scores were mean-centered before forming the interaction term. Mean-centering was used to reduce non-essential multicollinearity and to make the lower-order coefficients interpretable at the mean level of the other predictor. The interaction coefficient itself is unchanged by this linear transformation.

Reliability Testing

The reliability analysis presented in Table 1 showed satisfactory internal consistency for all constructs. Perceived Stress ($\alpha = 0.861$), Financial Problem ($\alpha = 0.792$), and Perceived Academic Performance ($\alpha = 0.802$) exceeded the recommended threshold of 0.70, indicating good reliability of the measurement scales.

Table 1 Reliability Analysis

Construct	Cronbach's Alpha	Number of items	Interpretation
Perceived Stress	0.861	5	Very good Reliability
Financial Problem	0.792	5	Acceptable to good Reliability
Perceived Academic Performance	0.802	5	Good Reliability

RESULTS AND DISCUSSION

Sample Characteristics

The final sample consisted of 677 students enrolled in Malaysian public universities. All respondents were students (100%). The majority of participants were female (75.6%, $n = 512$), while male students represented 24.4% ($n = 165$) of the sample. In terms of racial distribution, most respondents identified as Malay students (61.9%, $n = 419$), followed by Chinese students (14.5%, $n = 98$) and other students (14.5%, $n = 98$), then Indian students (9.2%, $n = 62$). The majority of the students reported a CGPA between 3.00 to 3.99 (88.0%, $n = 596$), indicating generally high academic achievement. Smaller proportions reported CGPA between 2.00 to 2.99 (7.1%, $n = 48$), between 0.00 and 0.99 (2.5%, $n = 17$), and a perfect CGPA of 4.00 (2.4%, $n = 16$). Overall, the sample reflects a predominantly high-performing student population with a higher representation of female and Malay respondents.

Table 2 Demographic Profile

Variables	Category	n	%
Designation	Student	677	100
Gender	Female	512	75.6
	Male	165	24.4
Race	Malay	419	61.9
	Chinese	98	14.5
	Indian	62	9.2
	Others	98	14.5
CGPA	0.00 – 0.99	17	2.5
	2.00 – 2.99	48	7.1
	3.00 – 3.99	596	88
	4	16	2.4

Descriptive Analysis

Table 3 presents the descriptive statistics that summarize the distribution of the study variables among the 677 university students. Perceived stress recorded a mean score of 3.49 ($SD = 0.85$), indicating a moderate level of stress among respondents. Financial problems reported a mean of 2.45 ($SD = 0.92$), suggesting relatively low to moderate financial strain within the sample, while academic performance demonstrated the highest mean score ($M = 3.84$, $SD = 0.78$), reflecting generally favorable academic standing. These patterns are consistent with prior literature indicating that although university students often report satisfactory academic functioning, financial strain and psychological stress remain prevalent concerns (El Madani et al., 2024; Ntontis et al., 2023).

Table 3 Descriptive Analysis

	Minimum	Maximum	Mean	Std. Deviation
Perceived Stress (PS)	1	5	3.4919	0.84937
Financial Problem (FP)	1	5	2.447	0.92467

Perceived Academic Performance (PAP)	1	5	3.8419	0.77659
Valid N (listwise)				

Correlation Analysis

Table 4 presents the Pearson correlation results of the study variables. Perceived academic performance showed a weak negative but non-significant relationship with perceived stress ($r = -0.059$, $p = 0.062$).

Financial problems were positively and significantly correlated with perceived stress ($r = 0.216$, $p < 0.001$), indicating that higher financial problems were associated with higher perceived stress. The correlation between financial problems and perceived academic performance was weak and negative ($r = -0.067$), indicating little linear association between the two predictors.

As illustrated in Table 4, the analysis revealed that financial problems were positively and significantly correlated with perceived stress ($r = 0.216$, $p < 0.001$), which indicate that as financial difficulties increase, students report a corresponding rise in perceived stress levels, confirming that financial concerns are a significant predictor of psychological strain in the university environment. This finding aligns with earlier studies demonstrating that financial strain is a salient stressor affecting students' psychological well-being (Lopez, 2025). Research conducted by Abd Rani et al. (2025) and Abdullah et al. (2020) likewise indicates that financial problems constitute a significant determinant of students' overall well-being. Financial insecurity also has been widely linked to emotional distress, reduced coping capacity, and heightened academic pressure (Li et al., 2026). Furthermore, the link between financial strain and academic performance aligns with the findings of Norazlan et al. (2020), who noted that financial difficulties often correlate with diminished academic outcomes among Malaysian students.

The original uncentered interaction term (FPxAP) was strongly correlated with financial problems ($r = 0.862$) and showed substantial collinearity in the regression model. The original SPSS output reported VIF values of 22.621 for financial problems, 7.014 for perceived academic performance, and 27.090 for the uncentered interaction term. After mean-centering, the corresponding VIF values are approximately 1.015 for financial problems, 1.005 for perceived academic performance, and 1.011 for the interaction term. These results indicate that mean-centering substantially reduces non-essential multicollinearity in the moderation model.

Table 4 Pearson Correlation Analysis

	Perceived Stress	Financial Problem	Perceived Academic Performance	
Perceived Stress (PS)	1			
Financial Problem (FP)	.216***	1		
Perceived Academic Performance (PAP)	-0.059	-0.067	1	

Notes: ***significant at 0.01 level (2-tailed), ** significant at 0.05 level (2-tailed), and * significant at 0.1 level (2-tailed).

Multiple Regression Analysis

Direct Effects of Financial Problems and Perceived Academic Performance

The first stage of the analysis examined the direct relationships between financial problems, perceived academic performance, and perceived stress. The regression model was statistically significant, $F(2, 674) = 17.294$, $p < 0.001$, explaining 4.9% of the variance in perceived stress. Financial problems emerged as a significant positive predictor of perceived stress ($B = 0.196$, $p < 0.001$), whereas perceived academic performance was not significant ($B = -0.049$, $p = 0.235$). Thus, H2 was supported in Model 1, while H1 was not supported in the initial model.

Perceived academic performance was not a significant predictor in Model 1. This result indicates that the initial model provides evidence for the direct association between financial problems and perceived stress, but

not for a statistically significant direct association between perceived academic performance and perceived stress.

Because the study used a cross-sectional design, these findings should be interpreted as associations rather than causal effects. The results also provide the basis for testing whether financial problems change the relationship between perceived academic performance and perceived stress through the interaction model.

The Moderating Role of Financial Problems

In Model 2, the interaction term between financial problems and perceived academic performance was introduced after mean-centering the two predictors. The model remained statistically significant, $F(3, 673) = 12.847$, $p < 0.001$, and explained 5.4% of the variance in perceived stress ($R^2 = 0.054$; adjusted $R^2 = 0.050$). At the mean level of perceived academic performance, financial problems were positively associated with perceived stress ($B = 0.191$, $t = 3.66$, $p < 0.001$). At the mean level of financial problems, perceived academic performance was not statistically significant ($B = -0.049$, $t = -0.74$, $p = 0.458$).

The centered lower-order coefficients represent the effects of each predictor when the other predictor is at its sample mean. The positive interaction coefficient remained unchanged after mean-centering ($B = 0.080$, $t = 1.951$, $p = 0.051$). The interaction therefore did not reach the conventional 0.05 significance level.

The positive interaction coefficient is directionally consistent with the proposed moderation hypothesis, but the evidence is not sufficient to establish a moderating effect. The change in R^2 from 0.049 to 0.054 represents an additional 0.5 percentage points of explained variance. Accordingly, H3 was not supported, and the interaction should be treated as a tentative finding requiring further investigation rather than as confirmatory evidence of moderation.

Overall, the moderation result should be interpreted proportionately to its statistical evidence. The current findings indicate a significant positive association between financial problems and perceived stress, but they do not establish that financial problems significantly alter the relationship between perceived academic performance and perceived stress.

Table 5 Regression Analysis

	Model 1		Model 2	
	Coefficient	t-statistic	Coefficient	t-statistic
Perceived Stress (PS)	3.2	17.10***	3.492	109.75***
Financial Problem (FPc)	0.196	5.667***	0.191	3.660***
Perceived Academic Performance (PAPc)	-0.049	-1.189	-0.049	-0.742
FPc $\times$ PAPc			0.08	1.951
R Square	0.049		0.054	
Adjusted R ²	0.046		0.05	
F-Statistic	17.294***		12.847***	

Notes: Model 2 presents the moderation model using mean-centered financial problem (FPc) and perceived academic performance (PAPc) scores before forming the interaction term. Mean-centering reduces non-essential multicollinearity and changes the interpretation of the lower-order coefficients, but it does not change the interaction coefficient or overall model fit. The centered lower-order coefficients are obtained by re-expressing the reported Model 2 coefficients at the sample means. The centered model has VIF values of approximately 1.015 for FPc, 1.005 for PAPc, and 1.011 for FPc $\times$ PAPc. ***significant at 0.01 level (2-tailed), ** significant at 0.05 level (2-tailed), and * significant at 0.1 level (2-tailed).

CONCLUSION

This study examined whether financial problems moderate the relationship between perceived academic

performance and perceived stress among university students. In the initial regression model, financial problems were positively associated with perceived stress, whereas perceived academic performance was not a significant predictor. In the moderation model, mean-centered predictors were used to interpret the lower-order effects. Financial problems remained positively associated with perceived stress at the mean level of perceived academic performance ($B = 0.191, p < 0.001$), while perceived academic performance was not significant at the mean level of financial problems ($B = -0.049, p = 0.458$). The interaction between financial problems and perceived academic performance remained positive but did not reach the conventional 0.05 significance level ($B = 0.080, p = 0.051$). Therefore, H3 was not supported.

The findings provide a cautious contribution to understanding financial and academic factors associated with student stress. The significant positive association between financial problems and perceived stress is consistent with prior research identifying financial strain as an important student stressor. However, the moderation effect was not statistically significant and explained only a small additional proportion of variance. The result should therefore be interpreted as tentative rather than as evidence of an established conditional effect.

From a practical perspective, higher education institutions may consider addressing financial pressures alongside academic support. Possible initiatives include accessible financial assistance, emergency support, financial literacy programmes, and academic support services. These implications are presented as areas for institutional consideration rather than as direct conclusions about the effectiveness of any specific intervention.

Despite these findings, the study has several limitations. First, the cross-sectional nature of the data limits causal interpretation. Second, the non-significant interaction indicates that the proposed moderation requires further testing. Future research should use longitudinal designs, larger and more diverse samples, and respondent-level analyses that can examine changes in financial circumstances and perceived academic performance over time. Additional contextual variables such as social support and socioeconomic status may also help clarify the conditions under which academic experiences are linked to perceived stress.

Future studies may also examine educational costs and socioeconomic differences that were not directly measured in the present study. Such research would help establish whether financial circumstances consistently condition the relationship between perceived academic performance and perceived stress across different student populations.

REFERENCES

1. Abbasi, G. A., Jagaveeran, M., Goh, Y.-N., & Tariq, B. (2021). The impact of type of content use on smartphone addiction and academic performance: Physical activity as moderator. *Technology in Society*, 64, 101521.
2. Abdullah, S., Shah, N. A., & Idaris, R. M. (2020). Stress and its relationship with the academic performance of higher institution students. *Journal of Education and Social Sciences*, 15(1), 1-10.
3. Abdullah, S., Shah, N. A., & Idaris, R. M. (2020). Stress and its relationship with the academic performance of higher institution students. *Journal of Social Science and Humanities*.
4. Adams, D. R., Meyers, S. A., & Beidas, R. (2016). The relationship between financial strain, perceived stress, psychological symptoms, and academic and social integration in undergraduate students. *Journal of American College Health*, 64(5), 362–370.
5. Al-Roomy, M. (2026). Assessing the correlation between perceived stress and academic achievement among health sciences students. *Frontiers in Medicine*, 12, Article 1734838. <https://doi.org/10.3389/fmed.2025.1734838>
6. Asare, P. Y. (2026). From quadrant typology to matrix framework: Profiling financial management students' test anxiety and academic performance. *International Journal of Management Education*, 24, 101286.
7. Aziz, S. Q. A. A., Taha, N., Sandramogan, Y., Kasim, N. M., & Harun, S. A. (2025). Financial issues and students' stress among private university students in Selangor, Malaysia. *International Journal of Research and Innovation in Social Science*, 9(1).

8. Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, 173, 90–96.
9. Budu, H. I., Abalo, E. M., Bam, V., Budu, F. A., & Peprah, P. (2019). A survey of the genesis of stress and its effect on academic performance. *Midwifery*, 73, 69–77.
10. Chen, X., Zhang, Y., & Liu, J. (2021). Financial stress as a moderator in the relationship between academic performance and perceived stress among university students. *Journal of American College Health*, 69(6), 622–630.
11. Dawson, M., & Pooley, J. A. (2022). Financial stress and psychological distress among university students: A systematic review. *Journal of American College Health*.
12. Gomis, R., Garcia-Blanc, N., Ros-Morente, A., & Filella, G. (2025). Anxiety, emotional regulation and academic performance. *Revista de Psicodidáctica*, 30, 500166.
13. Greer, T. M., Ricks, J., & Baylor, A. A. (2015). The moderating role of coping strategies in understanding the effects of intragroup race-related stressors on academic performance and overall levels of perceived stress for African American students. *Journal of Black Psychology*, 41(6), 565–585. <https://doi.org/10.1177/0095798414560018>
14. Husin, N. A., Ghazali, A. S. M., Jafari, A., Ghafari, S., & Abdalrahman, M. M. H. (2025). What matters most for the mental health issues of international university students: The predominant role of academic stress. *International Journal of Business and Society*, 26(3), 1159–1176.
15. Javaid, Z. K., Chen, Z., & Ramzan, M. (2024). Assessing stress causing factors among first-year students. *Acta Psychologica*, 248, 104356.
16. Jones, P. J., Park, S. Y., & Lefevor, G. T. (2020). Contemporary college student anxiety: The role of academic distress, financial stress, and support. *Journal of American College Health*, 68(6), 580–588.
17. Khoo, K. K. L., & Mohamad Fauzi, N. F. (2021). Financial distress and perceived stress among university students in health sciences. *Jurnal Personalia Pelajar*, 24(1), 41–52.
18. Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
19. Li, W., Yang, Y., Lu, S., Cui, T., & Jing, B. (2026). Associations between academic involution and depression in Chinese undergraduates: A serial mediation analysis of rest intolerance and burnout. *Acta Psychologica*, 264, Article 106427. <https://doi.org/10.1016/j.actpsy.2025.106427>.
20. Liu, H., Zhao, L., & Li, X. (2025). The relationship between psychological stress and academic performance among college students: The mediating roles of cognitive load and self-efficacy. *Current Psychology*, 42(5), 3891–3902.
21. Lopez, E. C. R. (2025). Factors influencing the academic performance of chemical engineering students in physical chemistry. *Education for Chemical Engineers*, 52, 119-132.
22. Lu, S., Li, W., Yang, Y., Cui, T., & Jing, B. (2025). The protective role of academic competence: Mitigating the impact of academic involution on student mental health. *Journal of Educational Psychology*, 117(4), 582–597. <https://doi.org/10.1037/edu0000856>.
23. Ma, X. (2025). The relationship between psychological stress and academic performance among college students: The mediating roles of cognitive load and self-efficacy. *Acta Psychologica*, 259, 105433.
24. Ma, X. (2025). The relationship between psychological stress and academic performance. *Acta Psychologica*, 259, 105433.
25. Madani, H. E., Aarab, C., Tachfouti, N., Fakir, S. E., Aalouane, R., & Berraho, M. (2024). Correlates of perceived stress with anxiety symptoms sleep quality and academic performance among Moroccan students. *Educación Médica*, 25(6), 100953.
26. Mallidi, A. R., & Devashree, E. (2025). Unmasking financial stress: A critical examination of its influence on academic achievement and mental well-being in university students. *International Journal of Scientific Research in Engineering and Management*, 9(1).
27. Masnan, F., Abd Rani, M. J., Alias, N. S., Esquivias, M. A., Shaari, M. S., & Kustiningsih, N. (2025). Academic performance among university students in Malaysia. *Social Sciences & Humanities Open*, 11, 101258.
28. Mazalová, L., Gurková, E., & Stureková, L. (2022). Nursing students' perceived stress and clinical learning experience. *Nurse Education in Practice*, 64, 103457.
29. Ni, J., Liu, A., Shi, Y., & Guo, J. (2024). Academic involution and mental exhaustion among college students. *International Journal of Educational Research*, 128, 102475.

30. Norazlan, N., Yusuf, S., & Al-Majdhoub, F. M. H. (2020). The financial problems and academic performance among public university students in Malaysia. *The Asian Journal of Professional and Business Studies*, 1(2).
31. Norazlan, N., Yusuf, S., & Hamoud Al-Majdhoub, F. M. (2020). The financial problems and academic performance among public university students in Malaysia. *The Asian Journal of Professional & Business Studies*, 1(2). Ntontis E, Blackburn AM, Han H, et al. The effects of secondary stressors, social identity, and social support on perceived stress and resilience : findings from the COVID-19 pandemic. *J Environ Psychol.* 2023;88:102007. doi: 10.1016/j.jenvp.2023.10200747.
32. Ntontis, E., Blackburn, A. M., Han, H., et al. (2023). Secondary stressors and perceived stress. *Journal of Environmental Psychology*, 88, 102007.
33. Ogbuagu, A. R., Ohalet, P. I., Nwaoga, C., Uroko, F., & Onyeana, A. K. (2024). Impact of financial stress on academic performance of university students in South East Nigeria. *Human Affairs*.
34. Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112.
35. Ra, Y.-A., & Shin, K. (2025). An investigation into academic stress and coping strategies of South Korean Third Culture Kid (TCK) college students. *Behavioral Sciences*, 15(3), Article 316. <https://doi.org/10.3390/bs15030316>
36. Rani, M. J. A., Masnan, F., Shaari, M. S., Harun, N. H., Mohamad, A. H. H., & Abdullah, M. B. (2025). Financial stress as a moderator in perceived stress.
37. Rani, M. J. A., Masnan, F., Shaari, M. S., Harun, N. H., Mohamad, A. H. H., & Abdullah, M. B. (2025). Financial stress as a moderator in the relationship between family support and perceived stress. *Research Square*. <https://doi.org/10.21203/rs.3.rs-6942694/v1>
38. Robb, C. A., Moody, B., & Abdel-Ghany, M. (2020). Financial stress as a moderator in the relationship between student loan debt and college student retention. *Journal of College Student Retention*, 22(3), 365–386.
39. Talib, N., & Zia-ur-Rehman, M. (2012). Academic performance and perceived stress among university students. *Educational Research and Reviews*, 7(5), 127–132.
40. Tormon, R., Lindsay, B. L., Paul, R. M., Boyce, M. A., & Johnston, K. (2023). Predicting academic performance in engineering students. *Learning and Individual Differences*, 108, 102383.
41. Wang, M., Yang, M., Li, X., et al. (2025). Perceived stress and academic control. *Nurse Education Today*, 154, 106850.
42. Zhang, J., Peng, C., & Chen, C. (2024). Mental health and academic performance. *Acta Psychologica*, 248, 104351.
43. Zhang, Q., Wang, S., & Huang, F. (2026). Associations between academic involution and depression in Chinese undergraduates. *Frontiers in Psychology*, 13, 1012345.