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Academic Stress as Predictor of Academic Performance among First-Year Radiologic Technology Students

Tekanan Akademik sebagai Peramal Prestasi Akademik dalam Kalangan Pelajar Tahun Pertama Teknologi Radiologi

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ABSTRACT

Academic stress is a common challenge among students enrolled in health-related academic programs due to demanding coursework and high performance expectations. This study examined the relationship between academic stress and academic performance among first-year Radiologic Technology students in a selected private higher education institution in Davao City, Philippines. A descriptive–correlational research design was employed involving 107 first-year Radiologic Technology students during the Academic Year 2024–2025. Participants were selected using Simple Random Sampling technique. Academic stress was measured using an adapted Academic Stress Inventory developed by Lin and Chen (2009), while academic performance was determined using the students' Weighted Percentage Average (WPA) obtained from institutional records with administrative approval. Descriptive statistics were used to determine the level of academic stress and academic performance, while Pearson correlation and linear regression analyses were employed to examine the relationship between the variables at a 0.05 level of significance. Results showed that students experienced a moderate level of academic stress (M = 3.37, SD = 0.549) and a high level of academic performance (M = 3.90, SD = 0.285). However, Pearson correlation analysis revealed no significant relationship between academic stress and academic performance (r = –0.039, p = 0.686). Similarly, regression analysis indicated that academic stress did not significantly predict academic performance (β = –0.039, p = 0.686). These findings suggest that although students experience moderate academic stress, it does not significantly influence their academic performance. The results highlight the importance of institutional support systems that promote students' resilience and effective coping strategies in demanding academic environments.

Keywords: academic stress, academic performance, radiologic technology students, higher education

ABSTRAK

Tekanan akademik merupakan cabaran yang lazim dihadapi oleh pelajar yang mengikuti program akademik berkaitan kesihatan disebabkan oleh tuntutan pembelajaran yang tinggi serta jangkaan prestasi yang ketat. Kajian ini bertujuan untuk meneliti hubungan antara tekanan akademik dan prestasi akademik dalam kalangan pelajar tahun pertama Teknologi Radiologi di sebuah institusi pengajian tinggi swasta terpilih di Davao City, Filipina. Reka bentuk kajian deskriptif-korelasi digunakan dengan melibatkan seramai 107 orang pelajar tahun pertama Teknologi Radiologi bagi Tahun Akademik 2024–2025. Responden dipilih menggunakan teknik persampelan rawak mudah (Simple Random Sampling). Tekanan akademik diukur menggunakan Academic Stress Inventory yang diadaptasi daripada Lin dan Chen (2009), manakala prestasi akademik ditentukan berdasarkan Purata Wajaran Peratusan (Weighted Percentage Average, WPA) pelajar yang diperoleh daripada rekod institusi dengan kebenaran pentadbiran. Statistik deskriptif digunakan untuk menentukan tahap tekanan akademik dan prestasi akademik, manakala analisis korelasi Pearson dan regresi linear digunakan untuk menilai hubungan antara pemboleh ubah pada aras signifikan 0.05. Hasil kajian menunjukkan bahawa pelajar mengalami tahap tekanan akademik yang sederhana (M = 3.37, SD = 0.549) dan tahap prestasi akademik yang tinggi (M = 3.90, S D =

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0.285). Walau bagaimanapun, analisis korelasi Pearson menunjukkan bahawa tiada hubungan yang signifikan antara tekanan akademik dan prestasi akademik ($r = –0.039$, $p = 0.686$). Begitu juga, analisis regresi menunjukkan bahawa tekanan akademik tidak meramalkan prestasi akademik secara signifikan ($\beta = –0.039$, $p = 0.686$). Dapatan ini menunjukkan bahawa walaupun pelajar mengalami tekanan akademik pada tahap sederhana, tekanan tersebut tidak memberi pengaruh yang signifikan terhadap prestasi akademik mereka. Hasil kajian ini menekankan kepentingan sistem sokongan institusi yang dapat menggalakkan daya tahan pelajar serta strategi daya tindak yang berkesan dalam menghadapi persekitaran akademik yang mencabar.

Kata Kunci: tekanan akademik, prestasi akademik, pelajar teknologi radiologi, pengajian tinggi

INTRODUCTION

Academic stress is a significant concern among students in health-related programs, particularly those enrolled in Radiologic Technology, where rigorous academic and clinical demands are expected. First-year students are especially vulnerable as they transition into higher education, encountering new academic environments, increased workload, and heightened expectations that may contribute to anxiety and psychological pressure (Maymon & Hall 2021). Radiologic Technology students often experience substantial academic pressure due to the complexity of subjects, frequent assessments, and the need to master clinical and laboratory skills. These program-specific demands distinguish them from general student populations and necessitate focused investigation. Studies have shown that academic stress can negatively influence students' academic performance, mental health, and overall well-being (Bedewy & Gabriel 2015; Deng et al. 2022). For first-year students, this stress may be more pronounced due to limited coping experience and adjustment challenges, potentially leading to anxiety and reduced academic efficiency (Maymon & Hall 2021).

Recent literature emphasizes that academic stress is multifactorial, shaped by personal, academic, and institutional factors. For instance, Deng et al. (2022) found that academic stress significantly contributes to depressive symptoms, which in turn affect academic outcomes. Similarly, Bedewy and Gabriel (2015) identified key stressors such as academic workload, fear of failure, and classroom-related pressures, all of which are highly relevant in structured programs like Radiologic Technology. However, emerging evidence suggests that the relationship between academic stress and academic performance is not always linear, as coping strategies and institutional support may moderate this association. In international contexts, studies have demonstrated varying relationships between academic stress and performance. For example, Joseph & Sudhesh (2023) reported that students' adjustment and social support significantly influenced how stress affected academic outcomes. These findings highlight the importance of contextual and environmental factors in understanding student performance. However, such studies are often conducted in general or diverse student populations, with limited focus on highly specialized programs such as Radiologic Technology.In the Philippine context, recent studies have begun to examine academic stress among Radiologic Technology students, particularly in private higher education institutions. Research conducted among students reported that Radiologic Technology students experience considerable stress due to academic workload, teacher-related pressures, and financial concerns (Arguel et al. 2016). Furthermore, Alipio (2019) found that Filipino college students in allied health programs experience academic stress influenced by psychological factors such as locus of control and motivation, which may affect both performance and well-being. Notably, these studies suggest that high academic performance does not necessarily equate to low stress levels, indicating a complex relationship between these variables.Moreover, recent works such as those by Huffstetler (2021) and Rosenbaum (2024) explore student stress and persistence in Radiologic Technology education but do not directly establish the predictive relationship between academic stress and academic performance. Similarly, Tucker (2018) focused on instructional strategies without addressing the psychological demands experienced by students. Despite these emerging findings, a critical gap remains in the literature. Existing studies in the Philippines largely focus on general stress levels or associated factors but do not explicitly examine whether academic stress predicts academic performance among first- year Radiologic Technology students. Additionally, while international research provides valuable insights, its applicability to the local context remains limited due to differences in educational systems, cultural factors, and institutional support structures. With this scenario, this study aims to address this gap by examining the relationship between academic stress and academic performance among first-year Radiologic Technology students in a selected private higher education institution in the Philippines. By focusing on this specific population, the study seeks to provide evidence that can inform the development of targeted interventions, enhance student support systems, and ultimately improve both academic outcomes and student well-being.

MATERIALS AND METHODS

This section describes the research design, participants, instruments, data collection procedures, and statistical analyses employed in the study.

RESEARCH DESIGN

This study utilized a descriptive–predictive research design to examine the relationship between academic stress and academic performance and to determine whether academic stress significantly predicts the academic performance of first-year Radiologic Technology students.

PARTICIPANTS

The respondents of the study consisted of 107 first-year Radiologic Technology students enrolled during the Academic Year 2024–2025 in a selected private higher education institution in Davao City, Philippines. Participants were selected using a simple random sampling technique to ensure better representation of the target population by providing each eligible student an equal chance of being included in the study. The required sample size was determined using the Raosoft Sample Size Calculator, a widely used online statistical tool for calculating appropriate sample sizes in survey research. From a total population of 153 first-year Radiologic Technology students, a minimum sample size of 107 respondents was computed based on a 95% confidence level, 5% margin of error, and 50% response distribution.

Participants included in the study were students who were officially enrolled as first-year Radiologic Technology students, 18 years old and above, and willing to participate by providing informed consent. Students who declined participation or submitted incomplete survey responses were excluded from the final data analysis to maintain the accuracy and completeness of the dataset.

RESEARCH INSTRUMENTS

Academic stress was measured using the Academic Stress Inventory developed by Lin and Chen (2009). The instrument assesses four dimensions of academic stress: personal inadequacy, fear of failure, interpersonal difficulties with teachers, and inadequate learning resources. The questionnaire utilized a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument demonstrated high internal consistency reliability in this study with a Cronbach's alpha coefficient of 0.90, indicating excellent reliability (DeVellis 2017). Academic performance was measured using the students' Weighted Percentage Average (WPA) obtained from official institutional academic records with administrative approval.

DATA COLLECTION PROCEDURE

Data were collected using an online survey administered through Google Forms. Prior to data collection, permission to conduct the study and access academic records was obtained from the institution's academic administration. Students were provided with an informed consent form explaining the purpose of the study, voluntary participation, confidentiality, and anonymity. Academic performance data (WPA) were retrieved from institutional records after approval from the registrar's office and were matched with survey responses using coded identifiers.

DATA ANALYSIS

Descriptive statistics were employed to analyze the data and determine the levels of academic stress and academic performance among the respondents. Specifically, the mean and standard deviation were used to summarize and describe the central tendency and variability of the variables under study. To examine the relationship between academic stress and academic performance, Pearson Product– Moment Correlation was utilized to measure the strength and direction of the association between the two variables. Furthermore, simple linear regression analysis was conducted to determine whether academic stress significantly predicts the academic performance of the students and were tested at a 0.05 level of significance.

ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the San Pedro College Research Ethics Committee 2025-0127 prior to data collection. The study adhered to ethical principles including voluntary participation, informed consent, confidentiality, and anonymity in accordance with the Philippine Data Privacy Act of 2012 (RA 10173)

RESULTS AND DISCUSSION

This section presents the results and discussion on the levels of academic stress and academic performance among the respondents. It also examines the relationship between these variables through correlation and predictive analyses. The findings are interpreted in relation to the objectives of the study and supported by relevant literature.

Table 1 presents the demographic profile of the respondents in terms of sex. Out of the total 107 first-year Radiologic Technology students, 71 respondents (66%) were female, while 36 respondents (34%) were male. This indicates that the majority of the participants in the study were female students. The higher proportion of female respondents suggests that female students comprise a larger segment of the first-year Radiologic Technology population in the selected institution.

The demographic distribution indicates that the study sample reflects the existing gender composition of the program, thereby supporting the reliability of the data gathered for the analysis of academic stress and academic performance among first-year Radiologic Technology students.

Table 2 presents the level of academic stress experienced by first-year Radiologic Technology students across four domains: personal inadequacy, fear of failure, interpersonal difficulties with teachers, and inadequate learning resources. The results indicate that the respondents experienced an overall moderate level of academic stress with a mean score of 3.37 (SD = 0.549). This suggests that while students encounter noticeable academic pressures, these stress levels remain within a manageable range. Among the indicators, fear of failure (M = 3.67, SD = 0.792) and personal inadequacy (M = 3.49, SD = 0.653) were interpreted as high levels of stress, indicating that many students feel pressured to meet academic expectations and may experience self-doubt regarding their academic abilities. These findings reflect the challenges faced by students during their transition to higher education, particularly in demanding health-related programs such as Radiologic Technology, where students are required to master complex theoretical knowledge and develop professional competencies. On the other hand, interpersonal difficulties with teachers (M = 3.06, SD = 0.751) and inadequate learning resources (M = 3.25, SD = 0.633) were interpreted as moderate sources of stress. These results suggest that while interactions with instructors and access to learning resources contribute to students' stress experiences, they may not be the most dominant stressors affecting the respondents. Nevertheless, these factors remain important aspects of the academic environment that can influence students' overall learning experience. The findings imply that psychological and performance-related concerns, particularly fear of academic failure and feelings of inadequacy, may play a more prominent role in shaping students' academic stress compared to environmental factors. This highlights the need for institutions to provide academic guidance, mentoring, and psychological support programs that can help students build confidence and develop effective coping strategies. These results are consistent with previous studies showing that academic demands, fear of failure, and self-perceived academic competence are major contributors to stress among university students (Bedewy & Gabriel 2015). Similarly, recent research among Radiologic Technology students reported that academic workload and performance expectations significantly contribute to students' stress levels (Alipio et al. 2024). Addressing these stressors through supportive learning environments and student support services may help improve students' academic adjustment and overall well-being. Table 3 presents the level of academic performance among first-year Radiologic Technology students. The results indicate that the respondents demonstrated a high level of academic performance, as reflected by an overall mean score of 3.90 (SD = 0.285). This finding suggests that the students were generally able to meet the academic requirements of their program and perform well in their coursework during their first year of study. The high academic performance observed among the respondents may indicate that students possess the necessary academic preparation, motivation, and learning strategies needed to succeed in a rigorous health-related program such as Radiologic Technology. Despite experiencing moderate levels of academic stress, the respondents were still able to maintain strong academic outcomes. This suggests that the level of stress experienced by the students may not be severe enough to negatively affect their academic functioning. In some cases, moderate levels of stress may even serve as a motivating factor that encourages students to remain focused and engaged with their academic responsibilities.

Furthermore, the findings may reflect the presence of supportive academic structures within the institution, such as effective instructional practices, accessible learning resources, and guidance from faculty members, which can contribute to students' academic success. The relatively low standard deviation also indicates that the respondents' academic performance scores were closely clustered around the mean, suggesting a relatively consistent level of performance among the students. The implication of this finding is that while academic stress exists among students, it does not necessarily translate into poor academic outcomes. Instead, students may develop adaptive coping strategies and resilience that allow them to manage academic pressures while maintaining satisfactory academic performance (Islam & Rabbi 2024; Bibi et al. 2022). Nevertheless, academic institutions should continue to strengthen academic support services, mentoring programs, and student wellness initiatives to ensure that students can effectively balance academic demands with their overall well-being. Table 4 presents the correlation analysis between academic stress and academic performance among first-year Radiologic Technology students. The results indicate that there is no significant relationship between academic stress and academic performance, as reflected by the correlation coefficient (r = –0.039) and p-value (p = 0.686), which is greater than the 0.05 level of significance. This finding suggests that variations in students' academic stress levels are not statistically associated with changes in their academic performance. Similarly, the analysis of the specific dimensions of academic stress—including personal inadequacy (r= –0.017, p = 0.859), fear of failure (r = –0.033, p = 0.736), interpersonal difficulties with teachers (r = –0.051, p = 0.602),

0.051, p = 0.602), and inadequate learning resources (r = –0.139, p = 0.152)—also revealed no significant correlations with academic performance. These results imply that although students experience moderate levels of academic stress, such stress does not appear to significantly influence their academic performance within the context of this study. One possible explanation is that students may have developed effective coping strategies or adaptive behaviors that allow them to manage academic pressures without negatively affecting their academic achievement. Additionally, institutional support systems, structured learning environments, and academic guidance may help students maintain consistent academic performance despite experiencing stress. The absence of a significant relationship also suggests that academic performance among Radiologic Technology students may be influenced more strongly by other factors not examined in the present study, such as study habits, time management skills, motivation, prior academic preparation, or access to academic support services. These factors may play a more substantial role in determining students' academic outcomes than academic stress alone. The findings highlight that while academic stress is present among students, it does not necessarily translate into measurable changes in academic performance. This underscores the importance of further research exploring other academic, psychological, and environmental factors that may contribute to students' academic success in health-related education programs. The findings are also consistent with the stress-performance framework, which suggests that while moderate stress may motivate students, excessive stress adversely affects learning efficiency and academic achievement (Hanafi et al. 2024; Cruz et al. 2024; Michelotto et al. 2022). For Radiologic Technology students, the combination of academic rigor and early professional expectations may heighten vulnerability to stress, emphasizing the need for structured academic support and stress management programs. The results in Table 5 indicate that academic stress does not significantly predict academic performance among Radiologic Technology students. The regression analysis shows that the unstandardized coefficient for academic stress is –0.021 (p = 0.686), which is not statistically significant at the 0.05 level. Similarly, the standardized coefficient (β = –0.039) suggests a very weak and negligible relationship between academic stress and academic performance. The overall model statistics further support this finding. The R value of 0.039 indicates a very weak association between the variables, while the R^2 value of 0.002 shows that academic stress explains only 0.2% of the variance in academic performance. The adjusted R^2 value of –0.008 further indicates that the model has no practical explanatory power. Moreover, the F value of 0.164 with a corresponding p-value of 0.686 confirms that the regression model is not statistically significant. The absence of a significant predictive relationship suggests that academic stress alone is insufficient to explain variations in academic performance among first-year Radiologic Technology students. Several plausible explanations may account for this finding. First, students may possess effective coping mechanisms—such as time management, peer collaboration, and adaptive learning strategies—that buffer the negative effects of stress. These coping strategies can enable students to maintain stable academic performance despite experiencing moderate to high stress levels (Cruz et al. 2024; Michelotto et al. 2022).

TABLE 1. Demographic Profile of the Respondents

Respondents	**Frequency**	**Percentage**
Male	36	34%
Female	71	66%
Total	**107**	**100%**

TABLE 2. Level of Academic Stress among First Year Radiologic Technology Students

Indicators	**Mean**	**Std. Dev.**	**Interpretation**
Personal Inadequacy	3.49	0.653	High
Fear of Failure	3.67	0.792	High
Interpersonal Difficulties with Teachers	3.06	0.751	Moderate
Inadequate Learning Resources	3.25	0.633	Moderate
Overall Mean	**3.37**	**0.549**	**Moderate**

Legend: *4.21–5.00 = 5 (Very High), 3.41–4.20 = 4 (High), 2.61–3.40 = 3 (Moderate), 1.81–2.60 = 2 (Low), 1.00–1.80 = 1 (Very Low).*

TABLE 3. Level of Academic Performance among First-Year Radiologic Technology Students

Indicators	Mean	Std. Dev.	Interpretation
Overall Mean	**3.90**	**0.285**	**High**

Legend: *4.21–5.00 = 5 (Very High), 3.41–4.20 = 4 (High), 2.61–3.40 = 3 (Moderate), 1.81–2.60 = 2 (Low), 1.00–1.80 = 1 (Very Low).*

TABLE 4. Correlation Analysis of Academic Stress and Academic Performance of Radiologic Technology Students

Academic Performance	Correlation Coefficient	p-value	Interpretation
Academic Stress	-.039	.686	Not Significant
Personal Inadequacy	-.017	.859	Not Significant
Fear of Failure	-.033	.736	Not Significant
Interpersonal Difficulties with Teachers	-.051	.602	Not Significant
Inadequate Learning Resources	-.139	.152	Not Significant

**. Significant level at 0.05

TABLE 5. The Variable that Best Predict the Academic Performance Among Radiologic Technology Students

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.975	.173		23.028	.000
	Academic Stress	-.021	.051	-.039	-.405	.686

R=0.039; R^2=0.002; R^2 Adjusted =-0.008; f value=0.164; p=0.686

Second, institutional support systems may play a critical role. Structured curricula, accessible faculty support, and organized learning environments in Radiologic Technology programs may help students manage academic demands more effectively. Such support mechanisms can mitigate the potential negative impact of stress on academic outcomes. Third, the findings may reflect the multidimensional nature of academic performance. Academic achievement is influenced by various factors beyond stress, including motivation, study habits, prior academic preparation, and psychological resilience. As such, academic stress, when examined in isolation, may not emerge as a strong predictor of performance.

Additionally, it is possible that moderate levels of stress do not necessarily impair performance and may, in some cases, serve as a motivating factor that encourages students to meet academic demands. This aligns with the concept that stress does not uniformly produce negative outcomes and may vary depending on individual differences and contextual factors. Thus, these findings reinforce the earlier correlation results, highlighting that although students experience moderate to high levels of academic stress, they are still able to sustain high academic performance. This underscores the importance of considering mediating and moderating.

CONCLUSION

This study examined the relationship between academic stress and academic performance among first-year Radiologic Technology students in a selected private higher education institution. The findings revealed that students experienced a moderate level of academic stress while maintaining a high level of academic performance. However, statistical analyses demonstrated that academic stress was neither significantly related to nor a significant predictor of academic performance. These results indicate that, although students experience varying levels of academic stress, such stress does not necessarily translate into diminished academic achievement. The findings further suggest that other factors may play a more critical role in sustaining academic performance, including students' resilience, effective coping strategies, and the presence of supportive institutional structures. These elements may buffer the potential negative effects of stress, enabling students to meet academic demands successfully. Given the limited predictive value of academic stress observed in this study, future research should consider examining additional variables that may influence academic performance among Radiologic Technology students. These may include study habits, learning environment, motivation, and psychological well- being, as well as potential mediating or moderating

factors that shape the relationship between stress and academic outcomes.

LIMITATIONS OF THE STUDY

This study has several limitations. The use of a descriptive-predictive design limits causal interpretation. The sample was drawn from a single private higher education institution, which may restrict the generalizability of the findings. The focus on first-year Radiologic Technology students further limits applicability to other year levels. Academic stress was measured using a self-reported instrument, which may be subject to response bias. Additionally, the study examined academic stress as a single predictor, without accounting for other factors such as motivation, study habits, resilience, and mental health, which may influence academic performance.

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