INVESTIGATING THE INTERPLAY OF ACADEMIC STRESS, ANXIETY, AND SLEEP DISTURBANCES IN COLLEGE STUDENTS



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Investigating the Interplay of Academic Stress, Anxiety, and Sleep Disturbances in College Students

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Abstract
Poor sleep quality negatively affects students' cognitive abilities. Meanwhile, improperly managed academic stress and anxiety exacerbates sleep disorders, potentially impeding academic performance. This study aimed to examine the relationship between academic stress, anxiety, and sleep disorders among students. The research employed a quantitative, correlational design, with 109 students from Institut Agama Islam Negeri Kerinci, Indonesia, as research participants. Data were collected using instruments such as the Sleep Quality Scale (Cronbach's alpha 0.969), Academic Anxiety Scale (Cronbach's alpha 0.956), and Academic Stress Scale (Cronbach's alpha 0.980). The data were analyzed using descriptive statistics, as well as simple and multiple regression tests. The results indicate a correlation between the level of academic stress and academic anxiety and the incidence of sleep disorders in college students. In summary, higher levels of academic stress and anxiety increase the likelihood of individuals experiencing sleep disorders. It is expected that future research will expand the sample population to allow for more generalizable results for the student population.

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1. Introduction

Educational institutions rely heavily on students, while the government and educators play crucial roles in providing an optimal learning environment to achieve educational goals. The absence of any of these components would hinder the optimal functioning of education. To achieve maximum learning outcomes, students must remain active and focused during the learning process. Without their participation, learning outcomes will not be optimally achieved. However, students' learning processes do not always run smoothly. Sleep disorders are one of the influencing factors that hinder students from achieving their learning goals.

Sleep disorders are disruptions in normal sleep behavior and patterns. It causes distress and impairs daily functioning, affecting social activities, work, and driving. These disorders may manifest as abnormal movements during sleep, lack of sleep, or excessive sleep (Alsolami et al.,2020). Essentially, sleep carries a crucial physiological role for humans. Meanwhile, an individual's required amount and quality of sleep depend on various environmental factors that interact with the underlying physiological variables. Further, sleep is essential for learning and memory formation. It facilitates the process of memory consolidation by providing optimal conditions for the effective reorganization of representations. Additionally, sleep promotes the consolidation of spatial and contextual memories. During sleep, neurophysiological processes occur. This process integrates new data into pre-existing cortical networks. This hippocampal activity has been linked to memory consolidation and learning (Toscano-Hermoso et al., 2020).

Irregular sleep cycles and insufficient sleep among students have been shown to decrease memory and concentration, leading to reduced learning motivation during classroom learning (Devi et al.,2018). Poor sleep is also associated with lower academic performance due to decreased concentration (Lisiswanti et al., 2019). Additionally, these sleep disorders may also result in adverse consequences during the day, including depression (Williams et al., 2020). Research has revealed that sleep problems are associated with learning difficulties, neurocognitive performance, and poor academic achievement. According to previous studies, over 60% of students experience sleep issues,

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with more than 25% of them sleeping less than 7 hours per night, as indicated by an index measuring poor sleep quality. Additionally, between 16-23% of college students report experiencing symptoms of insomnia and significant mental health issues related to sleep disorders (Toscano-Hermoso et al., 2020). Sleep disorders are also prevalent among adults, thereby, possibly leading to negative outcomes such as motor vehicle accidents, reduced quality of life, and increased mortality rate (Do,2022). Persistent and repeated sleep disturbances also have a significant impact on an individual's health. Accordingly, it is important to diagnose and treat sleep or wake complaints to prevent negative socio-economic consequences (Kumar,2008).

A study conducted in Germany found that 36% of individuals aged 18-80 experienced poor sleep quality. Similarly, a cross-sectional study involving 5001 adults in Hong Kong, China, reported a prevalence of 39.4%. As commonly known, students transitioning from adolescence to adulthood and from home to campus often experience sleep deprivation. Further, college students frequently encounter various challenges, including academic pressure, social obligations, internet distractions, self-responsibility, and uncertain schedules (Li et al., 2020). Meanwhile, insomnia symptoms, such as short sleep and sleep disturbances, are also linked to an increased risk of several chronic health conditions, such as diabetes, hypertension, and other types of cardiovascular disease (Britton et al.,2020). Sleep disorders that cause anxiety can further lead to negative conditions, such as depression, anxiety, poor work performance, and stomach ulcers, and can even worsen self-esteem. Meanwhile, irregular sleep patterns have been reported, causing decreased alertness, irritability, and unstable emotions (Wardani & Tiastiningsih, 2023).

Although sleep disorders present a negative impact on many aspects, studies have reported that students still encounter this problem. For instance, (Gaultney, 2010) found that 27% of students are at risk of experiencing at least one type of sleep disorder. Similarly, Schlarb et al. (2017) reported that up to 60% of students participating in their study suffer from poor quality of life, while 7.7% of them meet all the criteria for insomnia disorders. Furthermore, studies also discovered that students experience insomnia and nightmares. Insomnia is defined as difficulty falling asleep or staying asleep, even when a person has the opportunity to do so. Insomnia sufferers often report feeling dissatisfied with their sleep and may experience symptoms such as fatigue, low energy, difficulty concentrating, mood disturbances, and decreased work performance. Insomnia can be categorized based on its duration. Meanwhile, acute insomnia is defined as a short-lived sleep disorder that often occurs due to life circumstances. It tends to recover without any treatment (Devi et al.,2018). Further, nightmares are vivid dreams associated with strong negative emotions that wake a person from sleep. Nightmares are often associated with various clinical problems and disorders, thereby, it is considered as a specific disorder (Toscano-Hermoso et al., 2020). Additionally, a study also reported that some students experience several types of sleep disorders, such as narcolepsy, restless legs syndrome, insomnia, and obstructive sleep apnea, with sleepwalking and nightmares being less commonly experienced by students (Al Salmani et al., 2020). The majority of the students in that study met the proposed DSM-5 criteria for chronic insomnia (9.5%). (Taylor et al., 2013) asserted that the group with chronic insomnia reported significantly worse sleep quality, higher levels of fatigue, depression, anxiety, and stress, as well as lower quality of life. Additionally, they reported greater use of hypnotics and stimulants to manage their sleep problems.

Several studies have investigated the relationship between academic stress and sleep disorders (Kalmbach et al., 2018; Han et al., 2012). Academic stress is a prominent area of research in university settings due to its impact on psychological health and emotional stability (De La Fuente et al., 2020). The adaptive threshold scale suggests that there is no significant correlation between academic stress and the desire for personal growth (Okechukwu et al., 2022). Academic stress is a result of personal or academic pressure experienced by students. It arises when there is a demand for higher academic performance from peers, teachers, or the general public. These expectations can often misrepresent students' abilities, leading to the development of psychological problems that hinder their ability to learn at school (Barseli et al.,2020). Further, academic stress can lead to increased psychological activity, resulting in persistent illness and resistance to change. To avoid reinforcing negative thoughts during sleep, it is important to avoid repeatedly discussing assignments or academic problems.

Aside from academic stress, academic anxiety also correlates with sleep disorders (Amir et al., 2023a; Hotijah et al., 2021a). Anxiety is a personal perception of tension, fear, nervousness, and

worry related to more significant activities of the nervous system (Kusumastuti, 2020). Meanwhile, academic anxiety is defined as tension and fear of events that may happen in the future in relation to the academic environment. This tension and fear can hinder the completion of academic tasks and activities (Sanitiara et al., 2014). Besides, academic anxiety also refers to disruptions in thought patterns, physical responses, and behavior due to the possibility of poor performance on academic assignments. It is a type of anxiety that manifests as cognitive, physiological, and perceptual reactions experienced by students in response to educational contexts. Academic anxiety can occur in various contexts, including teaching, peer review, and general classes, as well as in specific content areas such as math and reading comprehension (Fishstrom et al., 2022). It is a common psychological issue experienced by students, representing anxiety related to academic institutions, including teachers and specific courses (Aristawati et al., 2020). Academic failure may indicate mental health issues, such as anxiety, tension, depression, or lack of interest. Additionally, various factors can affect students' academic performance, including their gender and student type (Novitria et al., 2022). Academic anxiety is frequently accompanied by excessive thoughts about assignments, exams, or academic performance. These thoughts can be difficult to control, particularly at night, and can disrupt the sleep process, making it difficult for a person to fall asleep.

This study examines the relationship between academic stress, anxiety, and sleep disorders in college students. Previous research has explored the impact of academic stress and anxiety on sleep disorders. However, given the instability of the Indonesian education system, this study provides valuable insights into sleep-disordered behavior among college students. In particular, this study aims to establish a position for a higher education advisor who will oversee the implementation of a sleep disorders program, taking into account mental health and religiosity.

2. Method

This study adopted correlational research as it aims to investigate the relationship and level of association between two or more variables without manipulating them (Hasbi et al., 2023). A survey was conducted involving 4,260 students from the State Islamic Institute Kerinci to identify the influence of academic stress, academic anxiety, and sleep disorders. The data of 109 participants were selected from the population using convenience sampling. The students were requested to fill in personal identity, demographic variables, and questionnaire. The data was garnered in two weeks in January 2024. The characteristics of the respondents are presented in Table 1.

Table 1. Characteristics of research respondent

Characteristic	Category	Frequency	Percentage
Cohort/semester	2023/I	11	10.1%
	2022/III	63	57.8%
	2021/V	22	20.2%
	2020/VII	8	7.3%
	2019/IX	3	2.8%
	2018	2	1.8%
Gender	Male	61	56%
	Female	48	44%
GPA	>3.50	95	88%
	<3.50	13	12%
Experiencing sleep disturbances	Yes	81	74.3%
	No	28	25.7%

Table 1 shows that 61 (56%) of the respondents were male, while the remaining 48 (44%) were female. The majority of cohorts/semesters experiencing sleep disorders were those in the 2022/III class/semester, with a total of 63 people or 57.8%, followed by the 2021/V class/semester with 22 people or 20.2%, 2023/I with 11 people or 10.1%, 2020/VII with 8 people or 7.3%, 2019/IX with 3 people or 2.8%, and 2018/XI with 2 people or 1.8%. In terms of GPA, 95 of the participants (88%) had a GPA >3.50, while the remaining 13 people (12%) had a GPA <3.50. In the end, among all respondents, 81 of them (74.3%) reported experiencing sleep disturbances, while 28 of them (25.7%) had no sleep disturbances.

2.1. The Sleep Quality Scale

The researchers utilized the sleep quality research scale developed by Hyeryeon Yi, Kyungrim Sin and Cholshin (2006). This instrument comprehensively measures adult sleep quality and evaluates its validity and reliability. The scale comprises 28 items, each rated on a 4-point Likert scale (4=strongly agree, 3=agree, 2=disagree, 1=strongly disagree). The scale comprises six factors, namely recovery after sleep, difficulty falling asleep, difficulty waking up, sleep satisfaction, difficulty maintaining sleep, and internal consistency. The correlation coefficient was 0.81, and the Cronbach Alpha test produced a score of 0.969, indicating its high reliability.

2.2. Academic Anxiety Scale (AAS)

This study adopted the Academic Anxiety Scale developed by Cassady, Pierson & Starling (Cassady et al., 2019). This scale is an improvement over the Cognitive Test Anxiety Scale, which only discusses cognitive indicators for anxiety tests (Cassady & Johnson, 2002). The academic Anxiety Scale measures broader aspects beyond cognitive indicators. The scale consisting contained 11 4-point Likert-type items to measure academic worries and fears. The response options are identical to the CTAR: '4 = Strongly agree,' '3 = agree,' '2 = disagree,' and '1 = Strongly disagree.' For instance, item number 1 states, 'I often worry that my best is not as good as expected in school.' Meanwhile, the reliability estimates for this scale are high, with a Guttman split-half reliability of 0.91 and a Cronbach's alpha of 0.90 (Cassady et al., 2019). Further, the Cronbach's Alpha test yielded a score of 0.956.

2.3. Academic Stress Scale

For measuring academic stress, this study utilized the Questionnaire of Academic Stress (QASSE) developed by Garcia-Ros, Perez Gonzales, and M. Tomas (García-Ros, Pérez-González, & Tomás, 2018). It evaluates sources and school situations that correlated to academic stress in adolescence and their impact on student's physical and psychological well-being. The QASSE comprises four dimensions, namely academic excellence, interaction with classmates, family pressure, and future-oriented perspective. The scale comprises 24 items and uses a four-choice Likert scale (4=strongly agree, 3=agree, 2=disagree, 1=strongly disagree). The Cronbach's Alpha test yielded a score of 0.980.

The data analysis was carried out using descriptive statistics, including mean, standard deviation, and percentage, to evaluate respondents' achievements on each variable. Addition-ally, simple regression and multiple regression techniques were applied to test the hypotheses. Regression analysis is a statistical method commonly used in research to analyze the relation-ship between one or more independent variables and their dependent variables (Ispriyanti & Safitri, 2012). Prior to the regression analysis, several requirements should be met, including normality, linearity, multicollinearity, and heteroscedasticity. All of these tests were conducted using the SPSS version 25.00 application.

3. Results and Discussion

3.1. Results

Data processing began with a descriptive analysis to evaluate the performance of each variable. The results of the descriptive processing are presented in Table 2. The academic stress variable had an average of 48.87 and a standard deviation of 19.74, which was categorized as low. These data indicate that the majority of respondents were in the very low category, followed by moderate, high, low, and very high. Therefore, some students still experience high levels of stress. Regarding academic anxiety, most respondents were categorized as having low levels, with an average score of 22.04. The majority of respondents (37.61%) reported very low academic anxiety. Additionally, the data indicate that participants experience low levels of sleep disturbance. However, upon reviewing the frequency distribution, it is evident that some students still experience moderate or deficient levels of sleep disturbance.

Table 2. Results of Descriptive Analysis

Variable	Average	Level (%)				
		Very Low	Low	Moderate	High	Very High
Academic Stress	48.87(19.74)	37 (33.94)	21 (19.26)	26 (23.85)	23 (21.10)	2 (1.83)
Academic Anxiety	22.04(9.01)	41 (37.61)	16 (14.67)	33 (30.27)	18 (16.51)	1 (0.91)
Sleep Disturbance	49.97(17.37)	43 (39.44)	38 (34.86)	23 (21.10)	5 (4.58)	0 (0)

Additionally, as described previously, prior to the regression test, the data should meet several requirements, such as normality, multicollinearity, and heteroscedasticity. Table 3 displays the results of these tests. From the normality test, it was found that all data, including the academic stress variable (p=0.000), the academic anxiety variable (p=0.000), and the sleep disturbance variable (p=0.000), were normally distributed. Additionally, multicollinearity testing revealed no issues between variables, as the VIF value of 6.949 was less than 10. Furthermore, after conducting heteroscedasticity testing on the academic stress variable and academic anxiety variable, it was concluded that no heteroscedasticity occurred (academic stress: p = 0.280; academic anxiety: p = 0.774). This analysis suggests that the assumption of homoscedasticity was met.

Table 3. Results of the Classical Assumption Test

No	Classical Assumption	Sig.	Decision
1	Normality test of academic stress	0.000<0.05	Normal
2	Normality test of academic anxiety	0.000<0.05	Normal
3	Normality test of sleep disturbance	0.000<0.05	Normal
4	Multicollinearity	6.949*	No multicollinearity
5	Heteroscedasticity test on academic stress variable	0.280**	No heteroscedasticity
6	Heteroscedasticity test on academic anxiety variable	0.774**	No heteroscedasticity

* VIF score
* glejser

As presented in Table 3, all of the analytical requirements have been met. A hypothesis test was conducted using simple regression to observe the partial effect of academic stress and academic anxiety on sleep disturbance. Beside, multiple regression analysis was also conducted to identify the combined effect. Table 4 shows the results of regression analysis concerning the effects of academic stress on sleep disturbance, as indicated by the t-value of 14.537, implying a significant effect of academic stress on sleep disturbance.

Table 4. Results of Simple Regression Test of Academic Stress Effects on Sleep Disorders

Unstandardized Coefficients		Standardized Coefficients	t	Sig.
B	Std. Error	Beta		
14.916	2.601		5.735	.000
.717	.049	.815	14.537	.000

The hypothesis test concerning the effect of academic anxiety on sleep disturbance was conducted using a simple regression test. The results in Table 5 show a significant effect of academic anxiety on sleep disturbance, with a t-value of 12.453 and a significance value of 0.000.

Table 5. Results of Simple Regression Test of Academic Anxiety Effects on Sleep Disturbance

Unstandardized Coefficients		Standardized Coefficients	t	Sig.
B	Std. Error	Beta		
17.270	2.837		6.088	.000
1.483	.119	.769	12.453	.000

In the following test, the simultaneous effects of academic stress and academic anxiety on students' sleep disturbances. The test was completed through the multiple regression analysis. The test's results are presented in Table 6.

Table 6. Results of Multiple Regression Analysis of Academic Stress and Academic Anxiety Simultaneous Effects on Students' Sleep Disorders

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	14.627	2.637		5.547	.000
AnxietyAK	.206	.286	.107	.720	.473
StressAK	.630	.130	.716	4.836	.000

Table 6 exhibits a t-count of 0.720 at a significant level of 0.473, indicating that Ha is accepted and the regression coefficient is significant. Additionally, the t-count value is 4.836 with a significant level of 0.000, further supporting the acceptance of Ha and the significance of the regression coefficient. Therefore, it can be concluded that academic stress and academic anxiety have an effect on sleep disorders

3.2. Discussion

The analysis results revealed that the students experience low levels of academic stress. Studies on academic stress have been extensively carried out, revealing excessive workload, competition among students, failure, financial difficulties, poor relationships between students and lecturers, and family problems at home as its primary causes (Busari, A. O., n.d.; Husnar et al., 2017). Further, a correlation has been observed between academic stress and sleep disturbance, with academic stress contributing to 66.4% of sleep disturbance. Similarly, previous research has also shown a negative correlation between academic stress and sleep quality (Deng et al., 2023; Herawati & Gayatri, 2019; Noveni et al., 2022). Statistically significant relationships between stress, anxiety, depression, and sleep quality have also been reported (Maisa et al., 2021a). Studies have also identified a positive correlation between sleep quality and academic stress in college students (Maisa et al., 2021a; Palasamy, J., Moorthy, S. K., Bodinagoda, N. M. R., Singam, P. T., & Ravi, P, n.d.; Ramadita et al., 2023; Tari et al., 2022). Meanwhile, other studies revealed that academic literacy has been found to have a significant effect on sleep quality (Alfaiz et al., 2019; Maisa et al., 2021b; Sari et al., 2020; Widyaningrum et al., 2023). Finally, the findings suggest that academic stress has a significant effect on sleep quality.

The analysis results also imply low academic anxiety among the participants. Academic anxiety is defined as an unpleasant feeling that affects students' physical and psychological well-being in academic settings (Permata & Widiasavitri, 2019). The analysis results revealed a correlation between academic anxiety and sleep disturbance, with academic anxiety contributing 59.2% to the relationship. As previous studies have shown, academic anxiety is significantly negatively correlated with student sleep quality (Amir et al., 2023b). Additionally, excessive anxiety hinders individuals from falling asleep, leading to poor sleeping habits (Hotijah et al., 2021b). Continuous anxiety can negatively impact the quality of sleep among college students, leading to disturbances in their psychological and physiological balance (Goszal & Yuwono, 2022). Additionally, anxiety can hinder problem-solving abilities and disrupt sleep patterns due to increased energy (Ghawa et al., 2021).

The research indicates that students encounter low sleep disturbance. However, if it is left untreated, prolonged sleep disturbance can lead to adverse conditions such as depression, fatigue, decreased performance and endurance, irritability, and even affect one's safety. Accordingly, individuals experiencing sleep deprivation may become weak, irritable, and emotionally unstable (Wardani & Tiastiningsih, 2023). Besides, there is a correlation between academic stress and academic anxiety and sleep disorders, with academic stress and anxiety contributing to 66.6% of sleep disorders. Previous research has shown that while some level of academic stress is necessary and unavoidable, chronically high academic stress is associated with high anxiety and sleep disturbances (Alhamed, 2023; Zunhammer et al., 2014). Other studies have discovered that academic stress has a direct impact on adolescents' sleep quality. Wang and Fan (2023) described that anxiety and fatigue can mediate this relationship. Moreover, stress can adversely affect physical health, causing sleeplessness as well as mental problems such as anxiety, panic, and depression. It can also disrupt academic performance and lead to negative behavior (Widyaningrum et al., 2023). Additionally, studies have shown that psychological factors, including stress, anxiety, and depression, can impact sleep quality in college students (Mohamed Mohamed Bayoumy et al., 2023).

The research findings have important implications for student welfare support strategies, especially in higher education institutions. Managing academic stress and anxiety is crucial to improving the quality of sleep in college students. Therefore, it is important to expand mental health education and support programs to help students manage academic stress and anxiety, which may hinder their sleep. The relationship between academic literacy and sleep quality emphasizes the importance of developing academic skills while prioritizing rest time. Psychological factors, such as stress, anxiety, and depression, require special attention in efforts to improve sleep quality and overall mental well-being. With substantial comprehension of the correlation between these variables, educational institutions can design more effective strategies to support students in achieving an optimal balance between their academic demands and their psychological well-being.

4. Conclusions

The research findings indicate a negative correlation between academic stress and sleep disorders. Furthermore, academic anxiety is found to affect sleep disorders. In addition, academic stress and anxiety impact students' sleep disorders. Based on these findings, it is recommended that the campus increase students' awareness of the concept of academic stress and anxiety, which can potentially lead to sleep disorders. Implementation of these measures will not only positively impact students' general health but also potentially improve their academic performance. With this understanding, campus stakeholders, particularly student assistance units or those involved in formulating policies related to student welfare, can design programs or policies to reduce stress and anxiety levels. Future research should broaden the scope of the study population to enable generalization of the research findings.

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