



The Association Between Anxiety Disorders and Insomnia Among College Students: A Cross-Sectional Study

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INTRODUCTION

Sleep quality has numerous positive effects, including feeling well-rested, maintaining normal reflexes, and fostering healthy relationships. Conversely, poor sleep quality can lead to irritability, decreased productivity, and slowed cognitive responses. Law of The Republic of Indonesia concerning Health state that sleep is a fundamental human need to be able to develop physically, mentally, spiritually, and socially (Undang-Undang No. 17 Tahun 2023 Tentang Kesehatan, 2023).. Sleep disorders, particularly insomnia, have become increasingly prevalent across all age groups. The global prevalence of insomnia is estimated at 22%, with women experiencing higher rates than (Zeng et al., 2020). Young individuals, such as college students, are particularly vulnerable to insomnia (Jia et al., 2020). Insomnia is characterized by difficulty falling asleep and insufficient sleep duration, resulting in inadequate sleep quality. This

condition can lead to various social and cognitive impairments (Zhao et al., 2019). Additionally, individuals with untreated insomnia tend to have increased healthcare utilization, which can be costly across multiple service points (Wickwire et al., 2019).

Research conducted on a sample of 520 students has identified anxiety as one of the primary contributors to insomnia (Kaczurkin et al., 2021; Seun-Fadipe & Mosaku, 2017). During early adulthood, students undergo a critical period of adjustment to the college environment. Difficulties in adaptation can lead to various long-term mental health issues, with anxiety being a prevalent concern among students. Anxiety is a distressing and unpleasant emotional state triggered by internal tension resulting from internal or external stimuli. It is regulated by an autonomous neural mechanism, manifesting through physiological responses such as increased heart rate, rapid breathing, sweating palms, and dry mouth when an individual perceives a potentially threatening or frightening situation (Hamm, 2020; T. C. Wang et al., 2020). Additionally, anxiety can be characterized as a condition in which the fear of danger induces unexpected negative emotions that may arise unpredictably (Rensi et al., 2024). Individuals with poor sleep quality-characterized by problems such as insomnia, sleep fragmentation, or insufficient duration-tend to experience increased anxiety symptoms (Peng et al., 2024).

Levels of anxiety intensity are classified into mild anxiety, moderate anxiety, and severe anxiety. Severe levels of anxiety can cause panic in individuals which can hinder daily activities (Aninda Cahya Savitri & Luh Indah Desira Swandi, 2023). The level of seniority of students has their own anxiety, especially in the early semesters who will enter a new environment are more prone to experiencing excessive anxiety and feelings of fear. It can also be that the greatest anxiety is obtained in the final semester students waiting for graduation (Nabila et al., 2024), which can cause depression or excessive anxiety. Anxiety itself can cause difficulty sleeping because an anxious person will bring his anxiety to bed so that he has difficulty falling asleep (Chellappa & Aeschbach, 2022; Haugland et al., 2021). Anxiety can also cause difficulty starting sleep, entering a sleep phase that requires more than sixty minutes, having nightmares, difficulty waking up, and feeling less refreshed in the morning (Mutiar Anissa et al., 2022). This study aims to determine the relationship between insomnia and anxiety in students, which has never been done at the university where the study was conducted. The research university is a university with students from various ethnic groups in Indonesia. Previous studies have mostly focused on adult or student populations in Western countries and also on specific places. By identifying this gap and emphasizing the unique experiences and

cultural origins of the students, this study provides valuable insights that can inform targeted interventions to reduce insomnia and anxiety in this vulnerable group.

METHODS

This study is an analytic observational study employing a cross-sectional design. The research was conducted at Universitas Kristen Indonesia, one of Indonesia's oldest private universities located in a metropolitan area, between October and November 2024. The target population comprised active undergraduate students enrolled at the university. Due to time constraints and accessibility, 290 participants were selected using accidental sampling. However, we acknowledge that this sampling method may limit the generalizability of the findings.

To assess anxiety, we utilized the Self-Reporting Questionnaire (SRQ) (Prasetio et al., 2022). This instrument demonstrated strong reliability in a pilot study involving 32 students, with a correlation index ranging from 0.378 to 0.811 and a Cronbach's alpha of 0.880. The SRQ consists of 20 questions administered online, employing binary response options ("yes" or "no"). A response of "yes" to six or more questions indicates the presence of mental and emotional disorders.

To evaluate insomnia, we employed the Insomnia Severity Index (ISI) questionnaire, which assesses insomnia symptoms experienced over the preceding two weeks. Reliability testing of this instrument yielded a correlation index between 0.619 and 0.871, with a Cronbach's alpha of 0.816. The ISI utilizes a Likert scale ranging from 0 to 4, where a total score of 7 or below indicates no insomnia, and a score exceeding 7 signifies the presence of insomnia.

Prior to questionnaire completion, informed consent was obtained from all participants. The research protocol was reviewed and approved by the UKI Ethics Review Committee (reference number 661/UKI.LPPM/PPM.00.00/ET.2024) on September 17, 2024.

Data analysis was conducted using the Chi-Square test to examine the association between anxiety and insomnia. Additionally, the Odds Ratio (OR) was calculated using IBM SPSS 21 software.

RESULTS

Students who participated in this study were 290 students with a prevalence of anxiety 166 (57.2%), where the most anxious were women and students over 20 years old. It can be seen that the middle-class to new students are more anxious, compared to the year-of-study

students (table 1). Males had a lower risk of experiencing anxiety compared to females (OR = 0.55), with a statistically significant difference ($p = 0.019$). A Cramer's V value of 0.138 indicates a small to moderate association between gender and anxiety. The authors realize these result have the potential bias in the findings and have discussed this as a limitation of the study. In contrast, no significant difference was observed between age groups (OR = 0.93; $p = 0.854$), and the Cramer's V value was very small (0.011), suggesting a very weak or negligible association.

Table 1. Characteristics of Anxiety Respondents (n=290)

Variable	Normal	Anxiety	OR (95% CI)	p-value	Cramer's V
Sex					
Male	58 (51.8%)	54 (48.2%)	0.55 (0.34-0.89)	0.019	0.138
Female	66 (37%)	112 (63%)			
Year of Study					
2020	3 (50%)	3 (50%)			
2021	20 (51.3%)	19 (48.7%)			
2022	31 (37.3%)	52 (62.7%)			
2023	21 (48.8%)	22 (51.2%)			
2024	49 (41.2%)	70 (58.8%)			
Age					
17-19 years	53 (43.8%)	68 (56.2%)	0.93 (0.58–1.49)	0.854	0.011
≥20 years	71 (42%)	98 (58%)			

As for the prevalence of insomnia 241 (83.1%). If the level of insomnia is categorized, then those who experience mild insomnia are 51.9% of students, moderate insomnia in 41.5% of students, and severe insomnia in 6.6% of students (table 2). Subgroup analysis was performed to evaluate the association between insomnia and demographic variables, specifically sex and age. The results showed that the odds of experiencing insomnia were slightly lower in males than in females, with an odds ratio (OR) of 0.91 (95% Confidence Interval [CI]: 0.48–1.71, $p = 0.891$). However, this association was not statistically significant. The strength of the relationship between sex and insomnia was weak, as indicated by Cramer's $V = 0.008$.

Similarly, age group analysis revealed that respondents aged 17–19 years had a higher likelihood of reporting insomnia compared to those aged above 20 years, with an OR of 1.29 (95% CI: 0.70–2.39, $p = 0.514$), but again, the difference was not statistically significant. The association between age and insomnia was also weak, with a Cramer's V value of 0.038.

These findings suggest that while there may be slight differences in insomnia prevalence across sex and age groups, these differences are not statistically or clinically significant in this sample.

Table 2. Characteristics of Insomnia Status (n=290)

Variable	Insomnia	Without Insomnia	OR (95% CI)	p-value	Cramer's V
Sex					
Male	18 (16%)	94 (45.5%)	0.91 (0.48-1.71)	0.891	0.008
Female	31 (17.4%)	147 (41.6%)			
Year of Study					
2020	0	6 (100%)			
2021	6 (15.4%)	33 (84.6%)			
2022	14 (16.9%)	69 (83.1%)			
2023	6 (13.9%)	37 (86.1%)			
2024	23 (19.3%)	96 (80.7%)			
Age			1.29 (0.70-2.39)	0.514	0.038
17–19	23 (19%)	98 (81%)			
>20	26 (15.4%)	143 (84.6%)			
Level of Insomnia (n=241)					
Mild	125 (51.8%)	-			
Moderate	100 (41.5%)	-			
Severe	16 (6.7%)	-			

A strong and statistically significant association was found between anxiety and insomnia. Among respondents without anxiety, 64.3% reported insomnia, while 92.7% of those with anxiety experienced insomnia. The difference was highly significant ($p < 0.001$). The odds of having insomnia were approximately 7 times higher in respondents with anxiety compared to those without anxiety (OR = 7.1; 95% CI: 3.8–13.3) (table 3).

Table 3. Association between Anxiety and Insomnia

Anxiety	Insomnia		Total	p-value	OR CI 95%
	No	Yes			
No	35 (35.7%)	63 (64.3%)	98	0.000	7.1 (3.8 – 13.3)
Yes	14 (7.3%)	178 (92.7%)	192		

DISCUSSION

The results of this study prove a significant association between anxiety and insomnia among college students ($p < 0.001$). This finding suggests that anxiety as a psychological disorders, affects the sleep quality of college students, which can further affect their academic performance, physical health, and psychosocial well-being. In addition, poor sleep quality due to insomnia can lead to impaired cognitive function, memory consolidation, and overall academic performance (Budikayanti et al., 2024; Deng et al., 2023). Our findings align with previous research showing that inadequate sleep, especially when students sleep less than 5 or more than 10 hours, is associated with increased academic failure (Vedaa et al., 2019). Adequate sleep is essential for cognitive function and memory consolidation, if a person

experiences insomnia it can lead to poor academic performance which can also affect sleep and cognitive performance later.

Beyond these core findings, this study highlights how external factors, such as excessive use of social networking sites—a behavior prevalent among 73% of Indonesia's population (BPS-Statistics Indonesia, 2025) may contribute to poor sleep quality and cognitive failures (Ye et al., 2024; Zhang et al., 2023). This suggests that social media use may indirectly exacerbate anxiety and insomnia symptoms in students.

The results also showed that anxiety will cause insomnia 7.1 times greater than non-anxious students. A person who sleeps but whose sleep is not of high quality will likely be exposed to a greater increase in anxiety symptoms and thus easily experience higher mood disturbances such as increased tension, fatigue, confusion, and reduced vigor (Albrecht-Bisset et al., 2023; Sun et al., 2024). As we know the age of students in general is productive and faced with building the structure of life, so it is possible to experience anxiety. Those with chronic insomnia experience instability in sleep characterized by increased frequency of awakenings and disturbances in the consolidation of emotions during sleep that cause anxiety, which in turn leads to poorer sleep quality (Riemann et al., 2023).

In addition, those who experience insomnia and anxiety show a decrease in the number or density of central nervous tissue, which consists mainly of nerve cell bodies (neurons), dendrites, and synapses (places of communication between neurons). The next disturbance that occurs is that the brain is less able to harmonize what the body feels (insula) with its emotional processing (cingulate) and cognitive control (superior frontal), resulting in emotional dysregulation and sleep problems (Xu et al., 2024). Anxiety usually causes problems with sleep, focus, empty thoughts, irritability, muscle tension, irritability, and social and/or occupational functioning, due to impaired modulation in the central nervous system due to low serotonin system activity and increased noradrenergic system activity (Almokhtar A. Adwas et al., 2019).

By providing comprehensive mental health and sleep support, universities can help students maintain better academic performance and overall well-being (Seehuus et al., 2024). Interventions could include counseling services, sleep hygiene workshops, and peer support groups. Family or community-based support is also important, particularly for students who may not live with their families (D. Wang et al., 2022). The role of the university is also important to be able to help students to improve their performance, with treatment that suits the characteristics of the problems of the students. Despite these findings, this study has several limitations. First, the use of a accidental sampling in method. Second, the reliance on self-

reported data may introduce response bias, as participants might underreport or overreport symptoms. Finally, the sampling method may not fully capture the diversity of the student population, potentially leading to sampling bias.

CONCLUSIONS

The prevalence of insomnia among students in this study was 83.1%, while the prevalence of anxiety was 57.2%. Anxiety was found to have a significant association with insomnia in college students ($p < .001$), with students who reported anxiety being approximately 7 times more likely to experience insomnia compared to students without anxiety ($OR = 7.1$; 95% CI: 3.8-13). This study contributes to the understanding of the significant overlap between anxiety and insomnia among students. Further research is needed to explore interventions that address both conditions simultaneously and to identify other contributing factors to sleep disturbances and psychological distress in this population.

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