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The Effects of Smoking Habits and Emotional Stress on Sleep Quality Among Final-Year University Students

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ABSTRACT

Final-year university students are particularly vulnerable to emotional stress due to academic pressure, the demands of completing a thesis, and anxiety about entering the workforce. In such circumstances, smoking is often used as a coping mechanism, although it may adversely affect sleep quality. This study aims to analyze the relationship between emotional stress, smoking habits, and sleep quality among final-year university students. This research employed a descriptive correlational design with a cross-sectional approach. The sample consisted of 50 final-year students selected through total sampling. Data collection instruments included the Kessler Psychological Distress Scale (K10) to assess emotional stress, a smoking habits questionnaire, and a sleep quality assessment via Google Forms. Data were analyzed using the Kendall Tau correlation test. The results showed a significant relationship between emotional stress and smoking habits ($p<0.05$), both of which were negatively correlated with sleep quality. Students with higher stress levels tended to smoke more frequently and experienced poorer sleep quality, including difficulty falling asleep and frequent nighttime awakenings. It can be concluded that emotional stress and smoking habits contribute to decreased sleep quality among students. Preventive interventions such as stress management education and smoking cessation efforts are essential to help maintain students' psychophysiological balance during the academic transition period.

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INTRODUCTION

The final year of university represents a critical transitional phase for students, often accompanied by unique pressures that can significantly affect their overall well-being (Zhai et al., 2018). This period is typically marked by increased academic workload, anxiety about future careers, and preparation for entering the workforce, all of which may disrupt previously established healthy lifestyle habits (Fuente et al., 2020). Specifically, the relationship between smoking habits, emotional stress, and sleep quality during this phase warrants further investigation, as these factors may interact and impact academic performance and long-term

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health outcomes (Albasheer et al., 2020). These three elements may reinforce one another in a negative cycle: stress increases smoking behavior, which in turn deteriorates sleep quality, and poor sleep exacerbates stress levels (Pérez-Jorge et al., 2025).

Final-year students frequently face challenges that negatively affect their sleep quality (Schmickler et al., 2023). Increased pressure during exam periods, for instance, often results in reduced sleep duration and lower sleep quality (Bouloukaki et al., 2023). Academic stress itself may stem from various sources such as exam anxiety, heavy workloads, peer pressure, lack of supporting facilities like libraries, health issues during evaluations, online group discussions, unpredictable course materials, overlapping deadlines, difficulties in writing research proposals, and unclear feedback from lecturers (Islam & Rabbi, 2024). Conventional teaching methods also contribute to stress, indicating the need for more innovative learning approaches. Additionally, financial pressure and uncertainty about future employment further intensify students' psychological burden, potentially leading to the adoption of maladaptive coping mechanisms, such as smoking.

Smoking, often perceived as a relief from psychological distress, involves nicotine, a stimulant that may provide temporary relaxation. However, over the long term, it fosters dependence and disrupts sleep regulation (Saminan, 2016). Chronic smoking-related respiratory issues can also increase the risk of sleep apnea and generally reduce sleep quality. Meanwhile, emotional stress triggers an increase in cortisol levels, activating the sympathetic nervous system, which disrupts sleep cycles, reduces deep sleep duration, and causes sleep disturbances (Saminan et al., 2024).

Poor sleep quality among final-year students can impair concentration, memory, decision-making, and emotional stability, ultimately affecting academic performance and increasing the risk of mental health disorders (Jaehne et al., 2009). Although numerous studies have examined the individual effects of stress and smoking habits on sleep quality, research that integrates both variables in a single model, particularly among final-year students in Indonesia, remains limited. Therefore, comprehensive and context-specific research is needed to address this gap.

Previous studies have demonstrated that academic stress significantly impacts students' sleep quality (Zhu et al., 2023). Other research has also identified a link between smoking habits and poor sleep quality, especially when smoking occurs close to bedtime (Khan et al., 2016; Allen et al., 2021). However, few studies have directly analyzed the interaction between emotional stress and smoking habits within a single model to explain sleep quality. In Indonesia, this integrative approach has rarely been applied, especially among final-year university students, using a data-driven quantitative methodology.

This study contributes to the literature by integrating two main variables—emotional stress and smoking habits—to simultaneously evaluate their impact on the sleep quality of final-year students. This approach enables the identification of interactive relationships and potential synergistic effects. Furthermore, the study is expected to enrich the local literature on the physiological and adaptive behavioral aspects of students in the final stages of higher education. Therefore, this research aims to analyze the influence of emotional stress and

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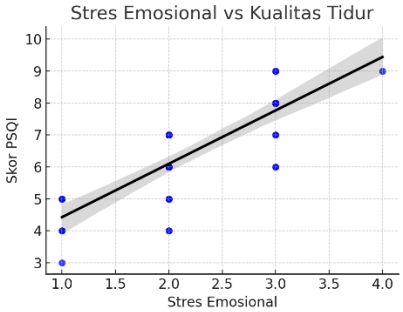
smoking habits on sleep quality among final-year university students and to explore the interaction between these variables within a unified analytical model.

METHODS

This study employed a descriptive-analytical design with a quantitative approach and utilized a survey method. The purpose of this design was to examine the effects of smoking habits and emotional stress on the sleep quality of final-year university students. The population consisted of all final-year students from various academic programs at Syiah Kuala University during the even semester of the 2024/2025 academic year. The researchers distributed questionnaires both online (via Google Forms) and offline (printed forms) to respondents who met the inclusion criteria. The collected data were analyzed using SPSS software.

RESULTS AND DISCUSSION

The Relationship Between Emotional Stress and Sleep Quality



Gambar 1. Garfik scatter plot

Based on Figure 1, it can be observed that higher levels of emotional stress are associated with increased PSQI scores, indicating a decline in sleep quality. Kendall's Tau statistical test revealed a strong positive correlation ($\tau = 0.736$; $p < 0.001$). This suggests that emotional stress experienced by final-year students, stemming from academic pressure and career uncertainty, has a significant impact on their sleep disturbances.

Final-year students typically face intense pressures such as:

1. Thesis and final project deadlines
2. Anxiety about career prospects
3. Social and financial stressors
4. The imbalance between academic responsibilities, part-time work, and social activities

These stressors lead students to experience various sleep disorders, including insomnia, frequent nighttime awakenings, and excessive daytime sleepiness. These sleep issues ultimately impair academic performance and mental health (Albasheer et al., 2020; Schmickler et al., 2023). High levels of academic stress can disrupt circadian rhythms and decrease sleep efficiency. This condition negatively impacts concentration, study productivity, and increases the risk of more serious mental health disorders, such as depression or anxiety.

These findings align with research by Bouloukaki et al. (2023), which demonstrated that academic stress reduces both the duration and quality of students' sleep. Furthermore, a

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study by Pérez-Jorge et al. (2025) highlighted that sleep disturbances contribute to a chronic stress cycle among university students. Psychological stress directly affects physiological functioning, particularly by disrupting normal sleep patterns. Stress activates the sympathetic nervous system and increases cortisol levels, both of which interfere with sleep initiation and maintenance (Zhai et al., 2018; Irwin, 2019). Emotional stress also triggers the activation of the sympathetic nervous system and the hypothalamic–pituitary–adrenal (HPA) axis, leading to excessive release of stress hormones such as cortisol. Elevated cortisol levels at night impair the body's ability to enter deep and REM sleep stages, thus reducing the restorative quality of sleep and causing persistent fatigue (Meerlo et al., 2008; Irwin, 2019).

The Relationship Between Smoking Habits and Sleep Quality

The second scatter plot illustrates that higher categories of smoking (from non-smokers to heavy smokers) are associated with higher PSQI scores, indicating more disturbed sleep quality. The Kendall's Tau correlation test showed a strong relationship ($\tau = 0.772$; $p < 0.001$). This finding suggests that smoking habits negatively impact sleep patterns.

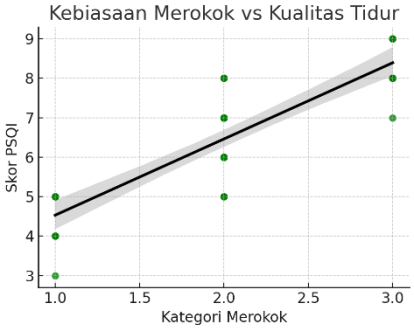

Figure 2. Scatter Plot of the Relationship Between Smoking Habits and Sleep Quality

Smoking has been known to activate the sympathetic nervous system and disrupt deep sleep phases (REM), which can reduce sleep efficiency (Jaehne et al., 2009). Saminan (2016) also explained that smoking habits contribute to airway irritation, which can further deteriorate sleep quality, particularly at night. Smoking has been proven to affect sleep quality through several interrelated physiological mechanisms negatively. Nicotine, the primary active compound in cigarettes, acts as a stimulant of the sympathetic nervous system, directly increasing heart rate, blood pressure, and brain activity. This system activation leads to a prolonged arousal state, making it difficult for individuals to fall asleep or maintain sleep for an extended duration (Jaehne et al., 2009).

Neurophysiological studies have shown that nicotine significantly disrupts sleep architecture through various mechanisms. Nicotine exposure can reduce total sleep duration and inhibit the occurrence of slow-wave sleep and the Rapid Eye Movement (REM) phase, both of which are crucial for physical recovery and memory consolidation during the sleep cycle. Moreover, nicotine is known to increase sleep latency, thereby extending the time taken to transition from wakefulness to the first stage of sleep. Sleep fragmentation is also heightened, with individuals experiencing more frequent nocturnal awakenings, thereby diminishing overall sleep efficiency.

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Cigarette smoke contains irritant compounds such as tar, carbon monoxide, and formaldehyde that can irritate the mucous membranes of both the upper and lower respiratory tracts. Chronic inflammatory processes triggered by this irritation elevate the risk of nighttime coughing, shortness of breath, and mild sleep apnea, all of which disrupt sleep continuity (Saminan, 2016). Conditions such as postnasal drip, mild bronchospasm, and increased mucus production are common symptoms in smokers. They may trigger coughing reflexes during sleep, leading to micro-arousals that significantly degrade sleep quality. These sleep disturbances can become chronic, resulting in daytime fatigue, cognitive impairments, and reduced academic or occupational performance.

If smoking habits and sleep disturbances persist over time, they can elevate the risk of developing several serious chronic diseases. These include chronic obstructive pulmonary disease (COPD), hypertension, and cardiovascular diseases due to heightened sympathetic nervous system activity. Sleep disorders may also lead to metabolic dysregulation, including increased risk of insulin resistance and other metabolic conditions. Importantly, poor sleep quality impacts neurotransmitter balance in the brain, potentially triggering depression and anxiety disorders, especially since disrupted REM phases play a critical role in emotional and stress processing.

The Relationship Between Emotional Stress and Smoking Habits

The third scatter plot illustrates that students with higher levels of emotional stress also tend to engage in heavier smoking habits. The Kendall's Tau correlation between stress and smoking behavior revealed a highly significant result ($\tau = 0.785$; $p < 0.001$). This finding indicates that stress drives students to use cigarettes as a coping mechanism, albeit a maladaptive one.

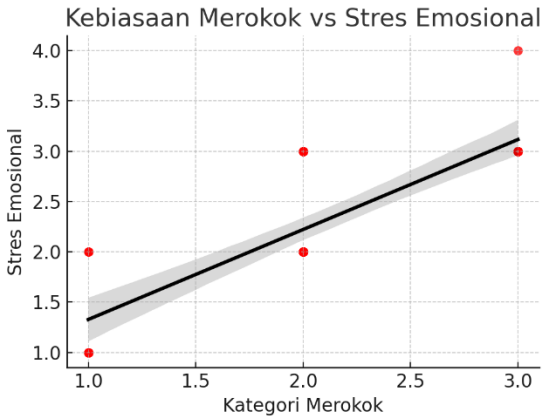

Figure 3. Scatter Plot of the Relationship Between Emotional Stress and Smoking Habits

This phenomenon is consistent with the findings of Islam & Rabbi (2024) and Saminan et al. (2024), who explained that emotional stress is one of the primary driving factors behind smoking behavior, particularly among individuals of productive age facing academic and economic pressures. Nicotine in cigarettes functions by stimulating the release of the neurotransmitter dopamine, which induces a short-term sense of pleasure and can temporarily alleviate psychological tension. However, this effect is transient and leads to

dependence. When the effects of nicotine wear off, individuals often experience a return of emotional emptiness or anxiety, thereby triggering the urge to smoke again. This cycle of addiction reinforces the link between stress and smoking habits (Parrott, 1999; Kassel et al., 2003).

Research by Kassel et al. (2003) demonstrated that emotional stress responses are strongly correlated with an increased frequency of smoking, particularly among individuals with low coping capacity or insufficient social support. Among university students, stressors such as final projects, academic demands, and uncertainty about the future can lead to chronic stress, which ultimately heightens the risk of substance use, such as nicotine, as a psychological escape.

Moreover, chronic emotional stress plays a role in altering the perception of long-term health risks, whereby individuals tend to prioritize immediate emotional relief over potential future health consequences. This implies that under stress, students may be more likely to disregard the harmful effects of smoking in favor of seeking "instant relief," despite the risks involved. Furthermore, a bibliometric analysis by Saminan et al. (2024) found that stress exerts systemic effects on physiological functions, including increasing susceptibility to addictive behaviors such as smoking. This underscores the importance of comprehensive stress management as a key strategy in efforts to reduce the prevalence of smoking habits, particularly among student populations.

CONCLUSION

This study demonstrates that emotional stress and smoking habits are closely associated with a decline in sleep quality among final-year university students. Elevated stress levels tend to drive smoking behavior as a coping mechanism, while nicotine further disrupts sleep architecture, leading to reduced sleep efficiency and duration. These sleep disturbances, in turn, exacerbate stress levels, creating a negative, self-reinforcing cycle. These findings highlight the urgent need for preventive interventions, including stress management education and smoking cessation programs, to help preserve sleep quality and overall health among students during the critical transition from academia to the workforce.

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