

The Relationship between Gadget Use Intensity with Student Sleep Quality

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ABSTRACT

Purpose Excessive gadget usage among university students is suspected of adversely affecting their daily sleep patterns and overall sleep quality. Sleep regulation is highly dependent on the hormone melatonin, which is sensitive to light exposure. Using a smartphone before sleep time and excessive of gadget usage will make screen light suppress the secretion of melatonin in the bloodstream and disrupt sleep rhythm. This study aimed to analyze the relationship between the relationship of gadget use and sleep quality among university students. Methodology: This study use a cross-sectional approach among students at university. Forty students selected through purposive sampling. Gadget use intensity was measured using a structured Likert-scale questionnaire Cronbach's alpha equals zero point seven eight nine, while sleep quality was evaluated using the Pittsburgh Sleep Quality Index PSQI with Cronbach's alpha equals zero point seven six six. Spearman's rank correlation test was performed with a significance level of zero point zero five. Findings: Respondents exhibited high gadget use intensity ninety point zero percent, n equals thirty-six and poor sleep quality eighty-five point zero percent, n equals thirty-four. Spearman's rank correlation showed no statistically significant relationship between gadget use intensity and sleep quality with p value zero point three eight nine. Research Implications: These findings suggest that while high gadget usage is prevalent among undergraduate students, sleep quality is a complex outcome influenced by broader lifestyle, academic, and psychosocial variables beyond screen time duration alone. Practical Implications: Higher education institutions and healthcare providers can utilize these findings to develop counseling and guidance programs regarding healthy gadget use and sleep habits for students. Originality/Value: This study provides empirical insights into gadget use intensity and sleep quality among Indonesian university students, with sleep quality assessed using the Pittsburgh Sleep Quality Index PSQI.

Keywords: Gadget use Intensity, Sleep Quality, University Students.

1. INTRODUCTION

In the modern digital era, electronic devices such as smartphones, laptops, and tablets have become an indispensable part of daily life, particularly among university students. Gadgets serve various primary functions, ranging from supporting academic learning and digital research to facilitating communication and social media interaction. However, the high intensity and continuous use of these devices often lead to uncontrolled screen time habits, where students frequently use their devices late into the night (Andira, Usman, 2022). Furthermore, students frequently exceed the recommended daily screen limit of two hours due to a combination of academic responsibilities and non-academic digital engagements, which may subsequently heighten the risk of physical and mental health issues (Daeli, Frisca and Manurung, 2026).

Sleep is a fundamental biological need required for physiological recovery, stamina restoration, and optimal daily functioning. Sleep quality refers to an individual's overall satisfaction with their sleep experience, ensuring they wake up feeling refreshed without experiencing daytime fatigue, restlessness, lethargy, or frequent drowsiness. However, sleep regulation is heavily dependent on the hormone melatonin, which is sensitive to light exposure. Using smartphones before going to bed exposes users to screen light that suppresses melatonin secretion in the bloodstream and disrupts the body's natural circadian rhythm (biological clock), ultimately leading to sleep disturbances (Murwani and Umam, 2021).

Globally, the prevalence of poor sleep quality ranges from 15.3% to 39.2% worldwide, with specific regional studies reporting significant rates such as 21.2% for males and 33.2% for females in the Netherlands, and 10.4% among adolescents in Norway. In Indonesia, poor sleep quality affects approximately 38% of individuals in urban areas and 37.7% in non-urban regions. Furthermore, this issue becomes notably pronounced among university students, particularly during academic thesis or final project completion, where the prevalence of poor sleep quality surges significantly to reach 68.70%. This high statistical burden highlights the critical need to investigate factors influencing student sleep hygiene (Sanger and Sepang, 2021).

Globally, the prevalence of excessive gadget usage and digital dependence has become a significant public health concern, with internet addiction rates reaching 10.9% in the Middle East, 8.0% in North America, and 7.1% across Asia. In Indonesia, digital device adoption is exceptionally high and predominantly driven by young adults and university students, where active internet users increased significantly from 71.19 million to 83.7 million individuals nationwide. Furthermore, a large proportion of young internet users spend more than three hours per day on their devices, with heavy usage reaching 42.4% among adolescents. This massive integration of technology into everyday routines underscores the urgency of examining how excessive screen exposure influences student sleep patterns (Rini, 2020).

One of the most common sleep problems among university students is insomnia, which involves difficulty initiating and maintaining sleep. This condition frequently leads to poor sleep quality and reduced learning concentration. Sleep disturbances among students can cause negative. This is supported by (Schmickler *et al.*, 2023), indicating that students who do not prioritise sleep experience a deterioration in learning capacity and poor academic performance.

Furthermore, prolonged exposure to digital screens has been linked to digital eye strain (DES) and visual fatigue. Digital eye strain refers to a cluster of ocular and physical discomforts arising from extended screen time, commonly characterised by symptoms such as dry eyes, eye redness, and blurred vision, whereas visual fatigue involves temporary ocular exhaustion and reduced visual comfort resulting from visually demanding tasks (Khorrami, 2026).

Impacts on overall health, physical and mental well-being, and academic performance, as reflected in academic achievement. Consequently, maintaining good sleep quality is crucial for students' success in higher education, as irregular sleep patterns disrupt the learning process and cognitive concentration (Wulandari and Pranata, 2024).

2. LITERATURE REVIEW / THEORETICAL FRAMEWORK

Gadget Use Intensity

Gadget use intensity refers to the frequency, duration, and purpose of electronic device usage (such as smartphones, tablets, and laptops) in daily life (Wahyuliarmy, 2021). In contemporary student populations, high gadget intensity is often characterised by prolonged screen time, frequent checking of notifications, and active engagement with digital media or social networks, particularly during late-night hours preceding sleep.

Sleep Quality and the PSQI Framework

Sleep quality is a multidimensional concept that evaluates not only the total duration of sleep an individual achieves, but also sleep onset latency, sleep efficiency, and subjective sleep disturbances. Nursing students are particularly vulnerable to poor sleep quality due to academic burdens, clinical placement stressors, and lifestyle factors. To measure this objectively and reliably, this study utilises the Pittsburgh Sleep Quality Index (PSQI) (Hutasoit, Mandrofa, 2024), which evaluates several distinct components of sleep over a one-month interval, providing a comprehensive clinical score that differentiates between good and poor sleep quality.

Hypothesis

Based on the theoretical framework and empirical findings regarding the disruptive impact of screen exposure on student sleep patterns (Parulian and Soputri, 2023), this study hypothesises that there is a significant relationship between gadget use intensity and sleep quality among university students.

3. RESEARCH METHOD

Research Design

This study employed a quantitative research design with a cross-sectional approach to examine the relationship between gadget use intensity and sleep quality among university students.

Population and Sample

The population of this study consists of undergraduate students. A total of 40 respondents were selected using a purposive sampling technique based on specific inclusion criteria relevant to the study objectives.

Research Instruments

Data collection was conducted using standardised questionnaires. Gadget use intensity was measured using a structured Likert-scale questionnaire (Cronbach's $\alpha = 0.789$), while sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI) with Cronbach's $\alpha = 0.766$.

Data Analysis

Bivariate correlation analysis using Spearman's rank test was performed to evaluate the relationship between gadget use intensity and sleep quality scores. Spearman's rank correlation test was performed with a significance level of 0.05.

4. RESULTS

Spearman Rank Correlation between Gadget Use Intensity and Sleep Quality

Gadget Intensity	Spearman's rho	—
	df	—
	p-value	—
Sleep Quality	Spearman's rho	-0.140
	df	38
	p-value	0.389
Note. * $p < .05$, ** $p < .01$, *** $p < .001$		

The univariate analysis of the 40 university student respondents showed that the majority exhibited high gadget use intensity, accounting for 36 respondents (90.0%), while only 4 respondents (10.0%) were in the normal category. Regarding sleep quality evaluated using the PSQI questionnaire, 34 respondents (85.0%) experienced poor sleep quality, whereas only 6 respondents (15.0%) reported good sleep quality. Furthermore, bivariate correlation analysis using Spearman's rank test revealed a correlation coefficient of $r_s = -0.140$ with a p-value of 0.389. Since the p-value is greater than 0.05, the statistical analysis indicates no statistically significant linear correlation between gadget use intensity and sleep quality scores among the student participants.

5. DISCUSSION

The findings of this study revealed that the majority of university student respondents exhibited high gadget use intensity (90.0%) and poor sleep quality (85.0%). This high proportion aligns with contemporary trends demonstrating heavy digital device dependence among young adults, where smartphones and laptops are constantly utilised for academic tasks, social communication, and entertainment late into the night. Prolonged screen exposure before bedtime exposes users to short-wavelength blue light, which physiologically suppresses melatonin secretion and disturbs natural circadian rhythms, contributing to difficulties in maintaining healthy sleep patterns.

Despite the high prevalence of both high gadget intensity and poor sleep quality, the bivariate correlation analysis using Spearman's rank test indicated no statistically significant linear correlation between the two variables ($r_s = -0.140$, $p = 0.389$). Conceptually, this unexpected finding suggests that poor sleep quality among university students is a complex, multifactorial outcome rather than a direct linear consequence of screen time duration alone. While screen exposure plays a critical role, other psychological factors such as digital amnesia, where over-reliance on digital devices impairs the ability



to remember, process information, and focus independently, along with emotional instability, anxiety, and a lack of emotional control also contribute significantly. Furthermore, disrupted daily activity cycles and altered circadian rhythms caused by late-night gadget use (Robert and Kadiravan, 2022).

In addition, excessive digital device use is closely associated with physical strains such as repetitive forward neck flexion, heavy neck tilting, and prolonged sitting duration, which significantly increase mechanical demands on neck muscles and contribute to musculoskeletal discomfort among students (Salameh *et al.*, 2024).

Beyond gadget-related factors, sleep quality is also influenced by environmental and academic variables, such as academic stress, heavy coursework, and irregular study schedules (Antoniadou *et al.*, 2024). Environmental noise, caffeine consumption, and psychological coping mechanisms also heavily influence student sleep hygiene. Consequently, addressing student sleep quality requires a broader lifestyle and psychological guidance beyond merely limiting screen time duration.

6. CONCLUSION

This study concludes that there is no significant linear correlation between gadget use intensity and sleep quality among university students ($r_s = -0.140, p = 0.389$). This indicates that poor sleep quality is a complex, multifactorial issue rather than a direct consequence of screen time duration alone. Beyond gadget exposure, sleep hygiene and student well-being are heavily influenced by psychological factors, environmental conditions, and academic stressors, such as coursework demands and irregular schedules. Therefore, interventions addressing student sleep quality should adopt a holistic approach incorporating lifestyle modifications, stress management, and psychological support rather than focussing solely on limiting screen time. These findings highlight the need for academic institutions to implement targeted support systems and wellness programs to help nursing and university students manage academic pressures and maintain overall health.

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