The Relationship Between Screen Time, Sleep Quality and Stress Levels Among College Students

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Abstract

This research explores how screen exposure correlates with sleep disturbances and heightened stress levels in college students aged 18 to 24. Utilizing a quantitative, cross-sectional methodology, responses were gathered from 200 students through structured self-report questionnaires that included demographic details, daily screen usage, the Pittsburgh Sleep Quality Index (PSQI), and the Perceived Stress Scale (PSS). Statistical analysis revealed a significant positive association between screen use and stress levels ($r = 0.612$, $p < 0.01$) and an inverse relationship with sleep quality ($r = -0.612$, $p < 0.01$). Regression findings indicated that both screen duration ($\beta = -0.270$) and academic demands ($\beta = -0.213$) significantly impacted sleep quality, explaining 58.5% of its variability ($R^2 = 0.585$). Moreover, ANOVA results supported a significant difference in stress levels among distinct screen time brackets ($F = 5.42$, $p = 0.005$). The findings emphasize the detrimental consequences of excessive screen exposure on student well-being, urging the implementation of digital wellness strategies and improved sleep hygiene education.

Keywords: screen exposure, student well-being, perceived stress, sleep patterns, digital lifestyle, academic stress

1. Introduction

In the digital age, screen-based technologies such as smartphones, laptops, and tablets have become essential tools for students. While these devices facilitate academic engagement, virtual communication, and entertainment, prolonged screen exposure has raised concerns about its effects on health. For young adults enrolled in college, increased device usage has been linked to poor sleep outcomes and heightened psychological distress.

According to global health guidelines, individuals in the 18–24 age group should ideally get between 7 to 9 hours of rest per night. However, recent studies suggest that many students fall short of this benchmark due to erratic sleep schedules, often exacerbated by late-night screen use. Additionally, academic expectations, peer pressure, and financial constraints contribute to stress. Against this backdrop, screen use emerges as a potentially modifiable factor in this interplay between rest and mental strain.

Electronic devices, especially when used before bedtime, emit blue light that interferes with melatonin secretion, thereby delaying the onset of sleep. Simultaneously, social media and digital content may induce emotional arousal, disrupting sleep and contributing to stress. This study seeks to examine the associations among screen exposure, stress levels, and sleep patterns using validated psychometric instruments within

a sample of Indian college students. The growing dependence on digital media for academic and social interaction has made understanding these effects increasingly vital in the current educational landscape.

1.1 Research Gap and Rationale

While existing literature has extensively documented the general effects of screen time on mental and physical health, there remains a significant gap in focused, region-specific research targeting Indian college students, particularly within urban academic settings like Bangalore. Most prior studies have either concentrated on younger adolescents or working adults, overlooking the unique stressors and behavioral patterns prevalent among university-level youth. Furthermore, few studies have concurrently assessed the triadic relationship between screen exposure, sleep quality, and stress within a single framework using validated quantitative tools.

This study aims to bridge these gaps by offering a comprehensive evaluation of how daily screen usage affects both psychological (stress) and physiological (sleep) dimensions of student wellness. The rationale for this investigation lies in the increasing academic dependency on digital tools, paired with the parallel rise in technology-driven social interactions and entertainment consumption. Understanding these dynamics is essential for developing evidence-based interventions, promoting digital hygiene, and improving student outcomes in higher education environments.

2. Literature Review

Prior research has established a strong connection between excessive screen time and negative health outcomes, particularly among young adults. A study conducted by Levenson et al. (2017) found that college students who used their devices late at night were more likely to report sleep problems, poor academic performance, and increased emotional instability. Similarly, Demirci et al. (2015) observed that smartphone addiction was positively associated with anxiety and depression among university students.

Moreover, the content consumed via screens plays a crucial role in determining its impact. For instance, watching fast-paced or emotionally intense media shortly before bed can elevate cortisol levels and delay the onset of REM sleep. Passive scrolling through social media has also been linked to social isolation, body dissatisfaction, and fear of missing out (FoMO), which collectively contribute to elevated stress levels.

Several longitudinal studies have documented that students with high screen time have a greater likelihood of developing insomnia and irregular sleep cycles over time. In contrast, interventions aimed at reducing screen time such as digital detox programs have demonstrated improvements in both psychological and physiological well-being.

This literature underscores the importance of measuring not just the quantity of screen exposure, but also the context, content, and timing of digital interactions to understand their full impact on health outcomes.

3. Methodology

3.1 Participants

The sample comprised 200 college students aged 18 to 24 from higher education institutions in Bangalore. Convenience sampling was used. Eligible participants were current college attendees with daily screen usage. Those with pre-diagnosed sleep disorders or undergoing psychiatric treatment were excluded.

3.2 Tools for the Study

- Demographic Information Form: Recorded age, gender, academic year, and approximate daily screen exposure.

- Pittsburgh Sleep Quality Index (PSQI): A self-assessment instrument with 19 items that evaluates sleep habits over a month. A global score above 5 reflects poor sleep quality.
- Perceived Stress Scale (PSS): A 10-item tool that assesses the degree to which individuals perceive their lives as stressful. Respondents rate how often they felt or thought a certain way during the last month.

3.3 Procedure

Data collection was done via an online questionnaire distributed through institutional mailing lists and social media. Participants completed a digital consent form before responding to the survey. The survey took approximately 15 minutes.

Respondents were assured of confidentiality, and participation was entirely voluntary. Ethical clearance was obtained from the academic review board, and all data were anonymized prior to analysis.

3.4 Analytical Methods

Descriptive metrics were calculated to summarize participant characteristics. Pearson's correlation analysis examined interrelations among variables. Multiple regression assessed predictors of sleep quality. ANOVA compared stress scores across screen time groups. All statistical analyses were performed using SPSS v25, with significance levels set at $p < 0.05$.

4. Results

4.1 Descriptive Overview

- Average daily screen use: 4.2 hours (SD = 1.5)
- Average PSQI score: 6.4 (SD = 1.2)
- Average PSS score: 18.6 (SD = 4.9)

Most participants reported using screens for academic tasks, streaming entertainment, and maintaining social media interactions. Over 60% acknowledged using digital devices in bed, a behavior associated with delayed sleep onset and increased alertness.

4.2 Correlation Matrix

Significant relationships were observed:

- Screen Time & Stress: $r = 0.612$, $p < 0.01$
- Screen Time & Sleep Quality: $r = -0.612$, $p < 0.01$
- Sleep Quality & Stress: $r = -0.580$, $p < 0.01$

These findings suggest that higher screen engagement is significantly associated with reduced sleep quality and elevated stress, reinforcing the initial hypotheses.

4.3 Predictive Modeling

Regression analysis identified:

- Screen time: $\beta = -0.270$, $p < 0.01$
- Academic load: $\beta = -0.213$, $p < 0.01$
- Model fit: $R^2 = 0.585$

Together, these predictors accounted for more than half of the variance in reported sleep issues, highlighting their importance in shaping student well-being.

4.4 Group Comparisons

Stress levels varied significantly based on screen time exposure:

- ANOVA result: $F = 5.42$, $p = 0.005$

Students categorized into high screen time groups reported notably greater stress levels than their peers in

moderate or low usage brackets.

5. Discussion

This study affirms that increased screen exposure is closely linked to sleep disturbances and psychological stress among college students. The correlation and regression analyses point to both screen time and academic load as meaningful predictors of sleep inefficiency. These findings align with prior research and theoretical models that emphasize the role of cognitive and physiological stimulation caused by screens.

One key takeaway is the behavior of late-night screen usage, often justified by students as a necessary coping mechanism for academic overload. While it may provide short-term relief, the long-term implications include fatigue, reduced attention span, and emotional dysregulation. These outcomes can spiral into a cycle of decreased academic performance and heightened anxiety.

The role of social comparison should also not be overlooked. Students who spend significant time on social media may internalize unrealistic standards and experience lower self-esteem. This, in turn, may exacerbate stress and disturb sleep quality.

The statistical significance of the ANOVA results also suggests that screen time is not a trivial factor but a major contributor to elevated stress. Interventions that include both individual behavioral change and institutional policy adjustments may therefore offer a more holistic solution.

6. Conclusion

The findings of this research provide clear evidence of the interconnected nature of screen time, sleep quality, and stress levels among college students. As digital engagement becomes increasingly prevalent in academic and personal domains, understanding its consequences is critical to safeguarding student well-being. The data strongly suggest that excessive screen exposure is not merely a matter of habit, but a significant factor influencing physiological and psychological outcomes. The negative correlations between screen time and sleep quality, as well as the positive association between screen time and perceived stress, highlight the extent to which unregulated digital habits can impair daily functioning and academic performance.

Furthermore, the study reveals that academic demands amplify the effects of screen use, making time management and digital self-regulation essential skills for today's students. Institutions must not only acknowledge this issue but actively work to address it through curricular reform, mental health support, and awareness programs that prioritize balance between online and offline activities.

This research contributes to the growing body of literature on digital health and offers a strong foundation for implementing practical interventions aimed at promoting healthier digital behaviors. In a world increasingly dominated by screens, the ability to consciously regulate their use could prove to be one of the most valuable skills for young adults. Addressing this challenge through proactive education and institutional support can significantly enhance academic outcomes, mental resilience, and overall quality of life for students.

Ultimately, promoting responsible screen use is not only an individual responsibility but a collective one, requiring coordinated efforts from students, educators, families, and policy-makers. By fostering environments that value rest, focus, and emotional regulation, we empower students to thrive both personally and professionally in the digital age.

7. Implications

The implications of this research extend to multiple stakeholders in the higher education ecosystem. Academic institutions can play a pivotal role by designing curricula and student schedules that minimize screen reliance beyond classroom hours. Counseling centers may integrate sleep and digital usage assessments into routine mental health screenings. Moreover, educational campaigns on the importance of limiting screen exposure before bedtime and promoting healthier digital habits can be instrumental in reducing student stress.

Parents and guardians may also benefit from the insights provided in this study, especially in guiding and modeling balanced technology use. Policy-makers in the education sector could consider establishing guidelines around screen time for students and advocate for digital literacy programs that include information on mental and physical wellness.

On an individual level, students can become more conscious of their screen behavior and adopt self-regulation strategies such as screen curfews, use of blue light filters, and regular breaks from digital devices. Incorporating these changes can contribute significantly to their academic success and emotional health.

8. Limitations of the Study

Despite its contributions, this study is not without limitations. First, the reliance on self-reported data for screen time and sleep patterns may introduce response bias or inaccuracies due to subjective estimation. Future studies could incorporate objective tracking methods such as mobile applications or wearable devices to gather more precise data.

Second, the sample was restricted to students from urban colleges in Bangalore, which may limit the generalizability of the findings to other demographic or geographic groups. Students from rural areas or different academic streams may exhibit varied patterns of screen usage and stress.

Third, the cross-sectional design captures a snapshot in time, preventing the establishment of causal relationships. Longitudinal studies would be beneficial in assessing how changes in screen habits influence stress and sleep over an extended period.

Lastly, this study did not differentiate between various types of screen use—such as academic work, social networking, gaming, or video streaming—which may have different psychological impacts. Future research could explore the comparative effects of these specific activities.

9. Recommendations for Future Research

Future studies can expand upon the current findings in several meaningful ways. First, longitudinal research tracking screen usage and its psychological impact over time would provide clearer insights into causality and long-term effects. There is also a need to study diverse student populations, including those from rural regions, different cultural backgrounds, and various academic disciplines, to improve generalizability. Additionally, future research should explore the distinct effects of different types of screen use, such as social media, gaming, educational activities, or entertainment, to determine their specific contributions to stress and sleep quality. Experimental studies testing intervention methods such as digital detox programs, mindfulness training, or screen time tracking applications could evaluate their effectiveness in promoting healthier habits. The incorporation of physiological indicators like heart rate variability, sleep monitoring, and cortisol levels would add empirical depth and support the validity of findings. Moreover, the development and use of artificial intelligence (AI)-based tools that provide

personalized feedback on digital behavior and mental well-being could be explored as innovative solutions. Collectively, these directions would help build a more comprehensive and actionable understanding of how digital lifestyles affect the well-being of college students.

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