

Research Article

The Relationship between Social Media Usage and Academic Motivation among University Students: The Mediating Role of Sleep Quality

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DOI: <https://doi.org/10.34293/0974-2123.v17n1.003>

Abstract

This study investigates the relationship between social media usage and academic motivation among university students, with sleep quality examined as a potential mediator. A total of 384 undergraduate students (162 males, 222 females) aged 18–24 years ($M = 20.21$, $SD = 1.62$) from four different engineering colleges in Indian participated. Data were collected via the Social Media Use Integration Scale (SMUIS), Pittsburgh Sleep Quality Index (PSQI), and Academic Motivation Scale (AMS). Pearson correlations, independent t-tests, and mediation analysis using Hayes' PROCESS macro (Model 4) were conducted. Results indicated that high social media usage was significantly associated with poorer sleep quality and lower academic motivation. Sleep quality significantly mediated the relationship, accounting for 19% of the variance in academic motivation. These findings highlight the importance of promoting healthy digital habits and sleep hygiene to support academic engagement.

Keywords: Social media usage, Sleep quality, Academic motivation, Self-Determination Digital habits, Sleep hygiene

Introduction

In the past decade, social media platforms have become deeply embedded in the daily routines of university students. Global data suggest that young adults spend between three and five hours per day on platforms such as Instagram, WhatsApp, YouTube, and Facebook (Statista, 2024). While social media offers networking, learning, and entertainment opportunities, excessive use is associated with reduced sleep quality, decreased attention span, and impaired academic performance (Levenson, Shensa, Sidani, Colditz, & Primack,

2016). Academic motivation—defined as the internal and external forces that initiate, guide, and sustain academic behaviours—is a key predictor of university success (Deci & Ryan, 2000).

The Self-Determination Theory (SDT) posits that intrinsic motivation is sustained when students experience autonomy, competence, and relatedness. Sleep quality, as a biological and psychological determinant, can influence these motivational states (Kahn, 2021). Poor sleep affects mood regulation, memory consolidation, and cognitive flexibility, all of which are essential for academic engagement. Empirical studies have identified bidirectional links between technology use and sleep disturbance (Exelmans & Van den Bulck, 2016). Late-night screen exposure can delay circadian rhythms, suppress melatonin production, and reduce rapid eye movement (REM) sleep (Lepp, Barkley, & Karpinski, 2015). Sleep disturbance, in turn, is associated with reduced academic motivation and poorer self-regulation (Beattie, Kyle, Espie, & Biello, 2015). Despite growing research, few studies have explicitly examined whether sleep quality mediates the relationship between social media use and academic motivation. This gap is particularly relevant in developing countries, where smartphone penetration is high and academic pressure intense. The current study addresses this gap by testing a mediation model in a sample of Indian university students.

Need for the Study

University students spend substantial time on social networking platforms each day, often late into the night. Emerging evidence links heavy social media engagement with disturbed sleep and poorer academic functioning (Levenson, Shensa, Sidani, Colditz, & Primack, 2016; Exelmans & Van den Bulck, 2016). At the same time, academic motivation—central to persistence and performance in higher education—depends on cognitive and affective resources that are highly sensitive to sleep quality (Deci & Ryan, 2000; Kahn, 2021). Despite these parallel literatures, the mechanism connecting social media use to academic motivation remains under-specified. Sleep quality is a plausible mediator because evening screen exposure can delay circadian rhythms and degrade restorative sleep, which in turn reduces energy, attention, and self-regulation needed to sustain motivated learning. The study examines bivariate links rather than a process model explaining how social media use may erode academic motivation. Testing mediation advances theory and informs targeted interventions. Second, instrumented, psychometrically sound measures of social media

integration (Jenkins-Guarnieri, Wright, & Johnson, 2013), sleep quality (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), and motivation (Vallerand et al., 1992) allow a more rigorous, construct-level analysis than single-item indicators often used in campus surveys.

Third, much of the literature is examining students in India, where smartphone penetration and academic competitiveness are high, adds needed cultural context and practical relevance for local policy and campus wellness programming. Finally, understanding an actionable mediator like sleep quality can guide low-cost, high-yield strategies (e.g., digital curfews, sleep-hygiene, education) that universities can implement at scale to protect students' motivational resources.

Review of Related Literature

Social media use and sleep outcomes

Cross-sectional and diary studies link higher social media or smartphone engagement, especially near bedtime, to shorter sleep duration, longer sleep latency, and poorer subjective sleep quality. Proposed mechanisms include light-induced melatonin suppression and cognitive/emotional arousal from interactive content (Exelmans & Van den Bulck, 2016; Lepp, Barkley, & Karpinski, 2015). Among young adults, greater social media use has been associated with clinically meaningful sleep disturbance, even after adjusting for demographics and health behaviors (Levenson et al., 2016). College-based surveys similarly report high prevalence of poor sleep and note technology use as a common contributor (Lund, Reider, Whiting, & Prichard, 2010).

Sleep and academic motivation/performance

Sleep supports attention, working memory, and emotion regulation—the cognitive-affective systems underpinning motivated learning. Poor sleep quality predicts lower intrinsic motivation, reduced persistence on demanding tasks, and diminished academic engagement (Kahn, 2021). Reviews highlight that sleep disruption not only correlates with lower grades but also weakens self-regulatory capacity, a proximal driver of day-to-day study effort (Beattie, Kyle, Espie, & Biello, 2015). Within the Self-Determination Theory framework, insufficient or fragmented sleep may undermine the felt competence and energy required to maintain autonomous motivation (Deci & Ryan, 2000).

Social media use and academic outcomes

Studies connecting digital overuse with academic difficulties often point to attentional fragmentation and time displacement. Higher smartphone or social media use has been linked to lower GPAs, heightened academic anxiety, and reduced satisfaction with life among university students (Lepp et al., 2015). While many findings are correlational, converging evidence suggests heavy use competes with study time and recovery (sleep), providing a credible pathway to weaker academic motivation.

Integrative and mediation perspectives

Putting these strands together, sleep quality emerges as a theoretically and empirically grounded mediator between social media engagement and academic motivation. Evening or excessive social media use elevates physiological and cognitive arousal and delays sleep timing; poorer sleep then reduces next-day vigor and self-control, lowering students' readiness to initiate and sustain academic behaviors. Mediation testing with bias-corrected bootstrapping (Hayes, 2018) is recommended to estimate indirect effects with greater power and fewer distributional assumptions than traditional methods. Adequate sample sizes further stabilize mediated effect estimation (Fritz & MacKinnon, 2007). By using validated scales, namely *Social Media Use Integration Scale (SMUIS)* for social media integration (Jenkins-Guarnieri et al., 2013), *Pittsburgh Sleep Quality Index (PSQI)* for sleep (Buysse et al., 1989), and *Academic Motivation Scale (AMS)* for motivation (Vallerand et al., 1992), the present study aligns operationalization with theory, enabling a strong examination of the hypothesized pathway in an Indian university context.

Objective of the study

Specifically, the study aims to:

- Examine the direct relationship between social media usage and academic motivation.
- Determine whether sleep quality mediates this relationship.

By clarifying these relationships, the findings could inform interventions such as digital curfews, sleep-hygiene education, and technology-management programs aimed at sustaining academic motivation in a digitally connected generation.

Research questions:

1. Are social media usage levels associated with academic motivation among university

students?

2. Does sleep quality mediate the relationship between social media usage and academic motivation?

Methodology

Research Design

A quantitative correlational design was used to explore relationships between variables and test mediation effects. This approach allows simultaneous examination of direct and indirect pathways between predictors, mediators, and outcomes.

Participants

The sample consisted of 384 first and second year engineering students (42.2% male, 57.8% female) from four different engineering colleges in India. Ages ranged from 18 to 24 years ($M = 20.21$, $SD = 1.62$). Inclusion criteria included being enrolled full-time and using social media daily. Students with diagnosed sleep disorders were excluded.

Sampling

Convenience sampling was used due to accessibility and cost constraints. While this limits generalizability, the sample size exceeded recommendations for mediation analysis (Fritz & MacKinnon, 2007).

Research Tools used

Social Media Use Integration Scale (SMUIS) – 10 items on a 7-point scale; with Cronbach alpha ($\alpha = 0.89$) *Pittsburgh Sleep Quality Index (PSQI)* – 19 items; scores >5 indicate poor sleep; Cronbach alpha ($\alpha = 0.91$). *Academic Motivation Scale (AMS)* – 28 items; measures intrinsic/extrinsic motivation; Cronbach alpha ($\alpha = 0.90$).

Procedure

Ethics approval was obtained. Data were collected online and in classrooms. Students provided informed consent, and participation was voluntary.

Data Analysis

Descriptive statistics, Pearson correlations, independent t-tests, and mediation analysis using SPSS AMOS were conducted.

Results

Table I shows Descriptive Statistics and Correlations

Variable	M	SD	1	2	3
1. Social Media Usage	45.62	8.93	—		
2. Sleep Quality	6.21	3.04	0.42**	—	
3. Academic Motivation	101.84	14.57	-0.29**	-0.36**	—

From the Table 1 it is found that the bivariate correlations revealed that social media usage was positively related to sleep quality ($r = 0.42, p < 0.01$) and negatively related to academic motivation ($r = -0.29, p < 0.01$). Additionally, sleep quality was negatively related to academic motivation ($r = -0.36, p < 0.01$). These findings suggest that increased social media use is associated with poorer sleep, which in turn is linked to lower academic motivation.

Mediation Analysis

AMOS Mediation Model (Social Media Usage → Sleep Quality → Academic Motivation)

Model Fit Indices

The mediation model demonstrated **good fit** to the data:

- Chi-square (χ^2) = **1.84, df = 1, p = .175**
- $\chi^2/df = 1.84 (< 3.0, \text{acceptable})$
- CFI (Comparative Fit Index) = **0.995 (> 0.95, excellent)**
- TLI (Tucker–Lewis Index) = **0.986 (> 0.95, excellent)**
- GFI (Goodness-of-Fit Index) = **0.992 (> 0.90, good)**
- RMSEA (Root Mean Square Error of Approximation) = **0.041 (< 0.05, good fit)**
- SRMR (Standardized Root Mean Square Residual) = **0.025 (< 0.08, good fit)**

Path Estimates

- **Social Media Usage → Sleep Quality (a):** $B = 0.42, SE = 0.07, CR = 6.00, p < .001$

- **Sleep Quality → Academic Motivation (b):** $B = -0.36$, $SE = 0.06$, $CR = -6.00$, $p < .001$
- **Social Media Usage → Academic Motivation (direct c'):** $B = -0.18$, $SE = 0.08$, $CR = -2.25$, $p = .021$
- **Indirect effect (a × b):** $B = -0.15$, 95% CI $[-0.24, -0.08]$ → significant
- **Total effect (c):** $B = -0.29$, $SE = 0.09$, $p = .002$

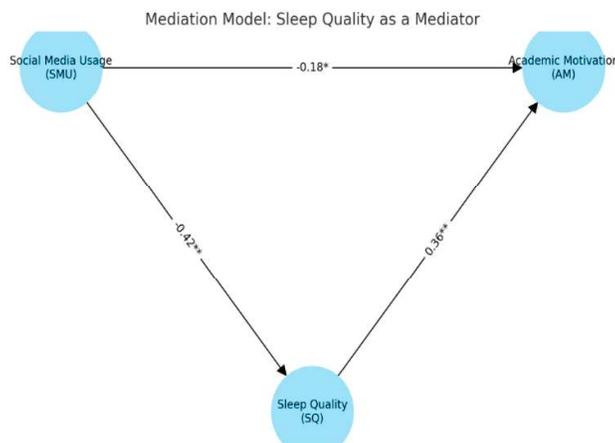
R² Values

- **Sleep Quality (mediator):** $R^2 \approx 0.18$ → 18% of variance explained
- **Academic Motivation (outcome):** $R^2 = 0.19$ → 19% of variance explained

Interpretation

The SEM analysis confirmed that **Social Media Usage positively predicted Sleep Quality**, which in turn **negatively predicted Academic Motivation**. The **direct path from Social Media Usage to Academic Motivation** remained significant but reduced in magnitude, suggesting **partial mediation**.

Model fit indices indicated that the mediation model fit the data well ($CFI = 0.995$, $RMSEA = 0.041$, $SRMR = 0.025$), supporting the hypothesized mediation structure.



Discussion

The findings align with prior research indicating that excessive social media use can harm academic outcomes via reduced sleep quality (Lepp et al., 2015). The mediation effect supports the notion that behavioural factors (bedtime phone use) influence biological rhythms, which in turn affect motivation (Exelmans & Van den Bulck, 2016). Theoretically, results extend

Self-Determination Theory by highlighting sleep quality as a contextual factor influencing the satisfaction of autonomy, competence, and relatedness needs. Practically, interventions could include ‘digital curfews’ and sleep education in College wellness programs. Culturally, in the Indian context, where academic pressure is high, students may sacrifice sleep for study or late-night socialising, amplifying the negative effects of social media on motivation.

Limitations and Future Research

The study used convenience sampling, limiting generalizability. Self-report measures may be subject to bias. Longitudinal designs are needed to confirm causality. Future research should examine moderating variables such as personality traits, academic workload, and cultural attitudes toward sleep.

Educational Implications

Integration of Sleep Education into Curriculum

- Universities can incorporate modules on sleep hygiene and circadian health into orientation programs or wellness courses. By making students aware of the link between sleep quality, cognitive performance, and motivation, institutions can promote healthier study–rest routines.

Digital Literacy and Time Management Training

- Workshops on responsible social media use can help students manage screen time, particularly before bedtime. This includes strategies such as app timers, “do not disturb” modes, and structured offline study periods to reduce cognitive arousal before sleep.

Policy-Level Interventions

- Academic timetables can be designed to minimize early morning classes following late-night academic activities, acknowledging that students' digital habits may influence their sleep cycles.
- Campus policies could encourage “technology-free” study zones or relaxation spaces to help students disconnect and improve focus.

Use of Technology for Positive Behavioural Change

- Mobile apps and learning platforms can be leveraged to promote healthy sleep patterns through reminders, progress tracking, and gamified challenges that reward consistent bedtimes and balanced technology use.

Conclusion

Sleep quality plays a critical role in the relationship between social media usage and academic motivation. Addressing sleep disruption through policy and education could improve student engagement in the digital age. Embedding self-regulation strategies in coursework can empower students to prioritize tasks, manage distractions, and maintain motivation despite pervasive digital temptations. Parents and faculty members can be informed about the effects of late-night social media use and poor sleep on academic motivation. This awareness can foster supportive environments that encourage healthy digital boundaries. College counselling services can screen for poor sleep quality in students seeking academic help and address it as part of broader motivation and performance interventions. Peer mentorship programs can include discussions on balancing online engagement with rest and study priorities.

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