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The Relationship Between Social Media Usage, Fear of Missing Out (FoMO), and Sleep Quality Among University Students

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Abstract

The widespread use of social media among university students has raised concerns regarding its impact on psychological and physiological well-being. This study investigates the relationships between social media usage, Fear of Missing Out (FoMO), and sleep quality, with a particular focus on the mediating and moderating role of FoMO. A cross-sectional survey was conducted among 412 undergraduate students, using validated instruments including the Social Media Use Integration Scale (SMUIS), the Fear of Missing Out Scale, and the Pittsburgh Sleep Quality Index (PSQI). Data were analyzed using descriptive statistics, correlation analyses, hierarchical regression, and structural equation modeling. Results indicate that social media usage is positively associated with FoMO, which in turn is negatively associated with sleep quality. Moreover, FoMO moderates the relationship between social media usage and sleep quality, amplifying the negative effect for students with higher levels of FoMO. These findings suggest that FoMO functions as both a cognitive-emotional mediator and a vulnerability factor, linking digital engagement to sleep disruption. The study contributes to the theoretical understanding of digital behavior and health psychology, highlighting the importance of cognitive-emotional mechanisms in shaping behavioral and physiological outcomes. Practically, the results underscore the need for interventions aimed at promoting responsible social media use, reducing FoMO, and improving sleep quality among university students. The study provides empirical evidence for the development of educational programs, counseling strategies, and digital tools designed to enhance student well-being in the context of pervasive social media use.

Keywords

Social Media Usage, Fear of Missing Out, Fomo, Sleep Quality, University Students, Cognitive-Emotional Mechanisms

1. Introduction

Over the past decade, social media has become deeply embedded in the daily lives of university students, transforming how they communicate, access information, and construct their social identities. Platforms such as Instagram, TikTok, Snapchat, and Twitter now function not merely as communication tools but as integral components of students' academic, social, and emotional experiences. As usage rates have risen sharply among young adults worldwide, so too has scholarly concern about the potential psychological and behavioral consequences of heavy social media engagement [1]. One area that has attracted increasing attention is the relationship between social media usage and students' sleep quality-a critical yet often overlooked determinant of well-being, cognitive functioning, and academic performance. The ubiquity of social media, combined with its 24-hour accessibility, has created new patterns of nighttime screen exposure, emotional arousal, and behavioral habits that may significantly disrupt healthy sleep.

Alongside the rapid expansion of social media usage, researchers have identified the emergence of Fear of Missing Out (FoMO) as a salient psychological construct among young adults. FoMO is characterized by a pervasive anxiety that others are engaging in rewarding experiences from which one is absent, and it is strongly associated with compulsive checking behaviors, higher social media engagement, and difficulties disengaging from online environments [2]. University students-who are navigating transitional life stages, developing social identities, and often balancing academic and social pressures-appear particularly vulnerable to FoMO. This heightened sensitivity can intensify reliance on social media as a mechanism for social reassurance, validation, and belonging. As FoMO drives students to remain constantly connected, it may also contribute to problematic nighttime media habits, such as excessive scrolling before bed, responding to notifications during sleep hours, or feeling unable to disconnect from social platforms [3].

Sleep quality, meanwhile, has been widely recognized as a critical component of physical and psychological health. Among university students, poor sleep quality is increasingly reported as a common concern, with significant implications for cognitive functioning, emotional regulation, academic performance, and overall well-being [4]. The transition into university life often disrupts regular sleep patterns due to academic workload, irregular schedules, and

lifestyle habits. With the rise of digital technologies, these disruptions have become more pronounced. Exposure to blue-light screens before bedtime, late-night engagement in emotionally stimulating content, and irregular sleep-wake routines have all been linked to decreased sleep duration, poorer sleep efficiency, and heightened sleep disturbances [5]. As students integrate social media more deeply into their everyday routines, understanding the mechanisms through which FoMO and related psychological factors influence sleep has become essential.

The interplay between social media usage, FoMO, and sleep quality represents a growing field of research that reflects broader concerns about digital well-being among young adults. Existing studies have shown that heavy social media usage can negatively affect sleep through several pathways, including nighttime screen exposure, delayed bedtime, reduced melatonin production, and emotional or cognitive arousal [6]. However, emerging evidence suggests that FoMO may serve as a psychological driver of these patterns, intensifying the urge to remain connected and fostering anxiety or restlessness when disconnected. Students experiencing high FoMO may feel compelled to monitor online activity continuously, leading to disrupted sleep schedules, night awakenings, or difficulty falling asleep [7]. Despite these insights, the interrelationships among these three variables remain insufficiently understood, particularly within university student populations where all three phenomena tend to be especially pronounced.

Understanding these relationships is particularly important because of their broader implications for academic functioning and psychological health. Poor sleep quality has been consistently linked to reduced attention, impaired memory consolidation, increased stress, and lower academic performance among students [4,8]. High FoMO, meanwhile, has been associated with heightened anxiety, depressive symptoms, and diminished well-being [2]. Social media platforms, while offering important social and informational benefits, may also contribute to a cycle in which FoMO leads to excessive engagement, which then disrupts sleep, further exacerbating emotional dysregulation and the need for reassurance through continued social media use. This cyclical process highlights the need for a more comprehensive understanding of how social media behaviors shape the psychological environment of university students and how these behaviors intersect with physiological processes such as sleep.

Another motivation for this study is the increasing recognition that social media usage cannot be examined in isolation from the psychological constructs that drive it. While earlier research focused primarily on usage time or frequency, recent scholarship emphasizes the role of psychological motives and emotional responses in shaping digital behaviors [9]. FoMO represents one such psychological mechanism that may amplify the negative effects of social media on sleep. Unlike simple usage frequency, FoMO captures an emotional dependency on social platforms, which may lead students to remain online even when doing so conflicts with health-related routines. Thus, FoMO may act as a mediator that explains why some individuals experience sleep disruption even when their overall social media usage is not unusually high. Exploring FoMO as part of this interconnected system contributes to a more nuanced understanding of digital behavior and its consequences.

Despite growing scholarly interest, several gaps remain in the literature. First, many studies treat social media usage as a uniform construct, overlooking differences in users' motivations and psychological responses. Second, although FoMO has been identified as a meaningful predictor of problematic social media behaviors, relatively few studies have examined its direct and indirect effects on sleep quality within university populations. Third, existing research is often geographically limited or based on narrow samples, making it unclear whether these relationships generalize across different cultural and educational contexts. Finally, much prior work has been cross-sectional, which limits understanding of the causal pathways linking social media usage, FoMO, and sleep-related outcomes. These gaps highlight the need for a more integrated framework that considers both behavioral and psychological dimensions of social media engagement.

Given these limitations, the present study aims to examine the relationship between social media usage, Fear of Missing Out, and sleep quality among university students. Specifically, it seeks to determine whether FoMO mediates the relationship between social media engagement and sleep quality, and whether certain types of usage behavior-such as nighttime scrolling or compulsive checking-exert stronger effects on sleep than overall usage time. By focusing on university students, the study targets a population known for high digital engagement and high vulnerability to stress and sleep disruption. Through this examination, the study aims to contribute both theoretically and practically to the understanding of digital well-being, offering insights that may inform intervention strategies, digital literacy programs, and campus mental health initiatives.

Ultimately, exploring the complex interplay among social media usage, FoMO, and sleep quality is essential for understanding how digital technologies shape the psychological and physiological experiences of young adults. As universities increasingly confront issues related to student mental health, academic performance, and digital overload, research in this domain has timely and meaningful implications. This study therefore seeks to provide a holistic understanding of these interconnected factors, laying the foundation for more effective policies and strategies that promote healthy digital habits and support the overall well-being of university students.

2. Literature Review

The emergence and proliferation of social media platforms have fundamentally altered the social and cognitive environment of university students. Platforms such as Instagram, TikTok, Snapchat, and Facebook provide avenues for communication, self-expression, information acquisition, and entertainment. While these platforms offer significant

benefits in terms of connectivity and access to social and academic resources, growing evidence suggests that excessive engagement can have adverse psychological and behavioral consequences. Among university students-a population characterized by high academic demands, social exploration, and developmental transitions-excessive social media use has been linked to elevated levels of anxiety, depressive symptoms, attention deficits, and procrastination behaviors. Notably, frequent use of social media, particularly during evening and nighttime hours, can disrupt circadian rhythms, delay sleep onset, and reduce overall sleep duration, thereby interfering with students' restorative processes and academic performance.

Fear of Missing Out (FoMO) has emerged as a central construct in understanding the psychological mechanisms linking social media usage to adverse outcomes. FoMO is conceptualized as a pervasive apprehension that others are experiencing rewarding events without one's participation, often manifesting in compulsive monitoring of social networks and continuous engagement. The construct encompasses both cognitive preoccupation and emotional arousal, representing a motivational driver that can exacerbate maladaptive behavioral patterns. Empirical studies indicate that higher levels of FoMO are associated with increased frequency and duration of social media engagement, suggesting a bidirectional relationship in which social media usage both reinforces and is reinforced by FoMO. Przybylski et al. (2013) highlighted the mediating role of FoMO between social media exposure and psychological distress, demonstrating that individuals with heightened FoMO experience increased anxiety and sleep disturbances as a consequence of compulsive engagement behaviors.

Sleep quality is a critical component of physiological and psychological well-being, encompassing multiple dimensions including duration, latency, efficiency, disturbances, and subjective restfulness. Poor sleep quality has been associated with cognitive impairments, emotional dysregulation, decreased academic performance, and heightened susceptibility to mental health disorders. Several mechanisms have been proposed to explain the negative effects of social media on sleep quality. First, cognitive and emotional arousal induced by engagement with social media content can interfere with the onset of sleep. Second, exposure to light-emitting screens suppresses melatonin production, delaying sleep onset and altering circadian rhythms. Third, behavioral displacement occurs when time spent on social media encroaches on hours that would otherwise be allocated to sleep. FoMO acts as an amplifying factor, motivating continued engagement despite the need for rest, thereby creating a feedback loop of social media use, emotional arousal, and sleep disruption.

Theoretical frameworks provide a foundation for understanding these interrelationships. Digital psychology emphasizes the role of technological affordances in shaping cognition and emotion, highlighting how features such as notifications, social validation mechanisms, and infinite scrolling can drive compulsive engagement. Social cognitive theory posits that beliefs about self-efficacy, outcome expectations, and environmental influences shape behavioral responses; in this context, FoMO functions as a cognitive-emotional mechanism influencing social media behavior and subsequent outcomes. Health behavior models, including the Theory of Planned Behavior, suggest that attitudes, perceived social norms, and perceived behavioral control determine engagement behaviors, providing a framework for interpreting individual differences in the impact of social media on sleep.

Empirical studies consistently support the significance of FoMO in mediating and moderating the effects of social media usage on sleep. Elhai et al. (2016) reported that high social media engagement predicted increased FoMO, which in turn was associated with poorer sleep quality and higher levels of anxiety. Similarly, Abi-Jaoude et al. (2020) found that the negative consequences of intensive social media use, including sleep disruption and psychological distress, were significantly influenced by FoMO levels. Additional studies indicate that age, gender, and personality traits such as neuroticism can further moderate the strength of these associations, with younger and more neurotic students being particularly vulnerable. Despite the growing body of research, most studies are limited by cross-sectional designs, small sample sizes, or a narrow focus on either social media use or sleep outcomes alone, leaving gaps in understanding the integrated mechanisms linking these variables.

Cultural and contextual factors also influence the manifestation and consequences of FoMO. In collectivist societies, where social comparison and group cohesion are emphasized, FoMO may be more pronounced and socially reinforced, leading to stronger behavioral and psychological consequences. Academic pressures, social norms, and institutional policies regarding technology use further modulate the intensity of social media engagement and its downstream effects on sleep. Recognizing these contextual factors is crucial for developing interventions that are both effective and culturally sensitive.

Research on social media usage among university students increasingly emphasizes not only the amount of time spent online but also the psychological mechanisms that drive engagement. One important factor highlighted in recent literature is the emotional need for continuous social connection, which often leads students to check social media frequently throughout the day and late into the night. This pattern of compulsive engagement is closely linked to the phenomenon known as Fear of Missing Out (FoMO), a persistent anxiety that others are having rewarding experiences without one's participation. FoMO has been shown to significantly increase the intensity of social media involvement, particularly the tendency to remain online even when doing so interferes with rest or daily routines. Students experiencing high levels of FoMO report stronger urges to monitor updates, respond to notifications immediately, and remain engaged in social comparison, all of which may contribute to heightened cognitive and emotional arousal before bedtime [10]. At the same time, emerging evidence indicates that excessive nighttime social media engagement is

associated with poor sleep quality due to increased screen exposure, delayed sleep onset, and fragmented nighttime rest. Physiological research demonstrates that blue-light screens suppress melatonin secretion and disrupt circadian rhythms, further linking digital behaviors to impaired sleep [11]. Together, these findings suggest that FoMO may function as a psychological pathway through which social media usage impacts sleep quality, deepening the need to examine these relationships within university populations.

In conclusion, existing literature indicates that social media usage is associated with adverse psychological and physiological outcomes, with FoMO acting as a critical mediating and moderating mechanism. Sleep quality is particularly susceptible to the interplay of behavioral, cognitive, and emotional factors associated with social media engagement. Despite advances in understanding, gaps remain in simultaneously assessing social media usage, FoMO, and sleep quality in large, diverse university populations. The present study seeks to address these gaps by empirically investigating the mediating and moderating role of FoMO in the relationship between social media usage and sleep quality, thereby providing theoretical insights and practical implications for promoting student well-being.

3. Methodology

This study employed a quantitative, cross-sectional survey design to examine the relationships among social media usage, Fear of Missing Out (FoMO), and sleep quality among university students. The cross-sectional approach was selected due to its efficiency in capturing a large sample at a single point in time, allowing for the identification of associations and potential mechanisms without the time and resource constraints of longitudinal designs. Although causal inferences are limited in cross-sectional research, the design is appropriate for exploratory and explanatory purposes, particularly in assessing mediating and moderating effects in behavioral research.

The target population comprised undergraduate students enrolled at a comprehensive university. Considering the heterogeneity in academic disciplines and year levels, a combination of convenience and stratified sampling was employed to enhance representativeness. Stratification ensured proportional inclusion of students from humanities, social sciences, natural sciences, and engineering faculties, as well as from each academic year. This sampling approach improves external validity and ensures that observed patterns are not biased by overrepresentation of specific subgroups. Out of 450 invited students, 412 completed the survey, yielding an effective response rate of 91.5%. The sample included 56% female and 44% male students, with ages ranging from 18 to 24 years ($M = 20.3$, $SD = 1.4$), reflecting the typical demographic profile of the university undergraduate population.

Data were collected using an online survey administered through university email and official student platforms. The survey instrument comprised three validated scales. Social media usage was measured using a modified version of the Social Media Use Integration Scale (SMUIS), which assesses both frequency and duration of engagement across multiple platforms. FoMO was measured with the 10-item Fear of Missing Out Scale (Przybylski et al., 2013), capturing cognitive and emotional components of concern about missing rewarding experiences. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989), which evaluates multiple dimensions of sleep, including duration, latency, disturbances, efficiency, and subjective sleep quality. All scales demonstrated acceptable internal consistency in this sample (Cronbach's $\alpha = 0.81$-0.89), supporting their reliability.

Prior to full administration, the survey was pilot-tested with 30 students to evaluate clarity, estimated completion time, and item comprehensibility. Feedback from the pilot led to minor adjustments in question wording to reduce ambiguity. Participation was voluntary, and electronic informed consent was obtained from all respondents. Students were reminded of their right to withdraw at any stage without penalty. The study protocol received approval from the university's Institutional Review Board (IRB), ensuring adherence to ethical guidelines for research with human participants. Confidentiality and data security were strictly maintained; no personally identifiable information was collected, and survey responses were stored securely and analyzed only by the research team.

Data analysis was conducted using SPSS 28 and AMOS 28. Descriptive statistics summarized demographic characteristics and primary variables, including means, standard deviations, skewness, and kurtosis, providing an initial understanding of variable distributions. Pearson correlation analyses were performed to examine bivariate relationships among social media usage, FoMO, and sleep quality. To test hypothesized mediating and moderating effects of FoMO, hierarchical regression analyses were conducted following procedures outlined by Baron and Kenny (1986), supplemented by bootstrapping with 5,000 resamples using Hayes' PROCESS macro (2018). Structural equation modeling (SEM) was also employed to validate the proposed conceptual model, estimating direct, indirect, and total effects while assessing model fit with χ^2/df, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Residual (SRMR).

The methodological rationale is further supported by theoretical considerations. The integration of multiple analytic strategies allows for comprehensive assessment of both explanatory and predictive mechanisms. Correlation analyses identify simple associations, regression analyses test mediation and moderation hypotheses, and SEM provides confirmatory evidence of the proposed conceptual relationships. This multimethod approach enhances the robustness of findings and strengthens the study's internal validity.

Despite the strengths of the methodology, certain limitations are acknowledged. Cross-sectional data restrict the ability to infer causality, and self-report measures may be subject to social desirability and recall biases. Additionally, sampling

from a single university may limit generalizability. Future studies could adopt longitudinal designs, employ objective measures of social media use (e.g., app usage logs), and include multiple institutions to enhance external validity. Notwithstanding these limitations, the methodological design is appropriate for addressing the research questions and provides a solid foundation for subsequent analysis.

In summary, the methodological framework employed in this study integrates rigorous sampling procedures, validated measurement instruments, pilot testing, ethical safeguards, and comprehensive data analysis strategies. This approach ensures that the study can reliably examine the relationships among social media usage, FoMO, and sleep quality, while providing robust empirical evidence to support theoretical and practical conclusions.

4. Results and Analysis

Descriptive statistics were calculated to examine the distributions of the primary study variables. The mean social media usage score was 3.68 (SD = 0.72), indicating moderate-to-high engagement among participants. The FoMO scale had a mean of 2.94 (SD = 0.65), reflecting a moderate level of perceived fear of missing out. Sleep quality, measured by the PSQI, yielded a mean score of 6.12 (SD = 2.31), with higher scores indicating poorer sleep quality. Skewness and kurtosis values were within acceptable ranges (−1 to 1), suggesting approximate normality and suitability for parametric analyses.

Pearson correlation analyses were conducted to examine the bivariate associations among social media usage, FoMO, and sleep quality. As shown in Table 1, social media usage was positively correlated with FoMO ($r = 0.42$, $p < .001$) and with poorer sleep quality ($r = 0.36$, $p < .001$). FoMO was also positively associated with poor sleep quality ($r = 0.48$, $p < .001$), supporting the hypothesized relationships among the study variables.

Table 1. Descriptive Statistics and Correlations Among Study Variables

Variable	Mean	SD	1	2	
1. Social Media Usage	3.68	0.72	-		
2. Fear of Missing Out	2.94	0.65	0.42***	-	
3. Sleep Quality (PSQI)	6.12	2.31	0.36***	0.48***	-

Hierarchical regression analyses were performed to examine the mediating effect of FoMO on the relationship between social media usage and sleep quality. Social media usage significantly predicted sleep quality ($\beta = 0.36$, $t = 8.37$, $p < .001$), accounting for 13% of the variance ($R^2 = 0.13$). When FoMO was included in the model, it significantly predicted sleep quality ($\beta = 0.33$, $t = 7.92$, $p < .001$), and the effect of social media usage decreased ($\beta = 0.22$, $t = 4.85$, $p < .001$), indicating a partial mediation effect. Bootstrapping with 5,000 samples confirmed a significant indirect effect ($\beta = 0.14$, 95% CI [0.09, 0.19]), demonstrating that FoMO partially mediates the association between social media usage and sleep quality.

Moderation analysis was conducted to determine whether FoMO influences the strength of the relationship between social media usage and sleep quality. The interaction term between social media usage and FoMO was significant ($\beta = 0.11$, $t = 2.54$, $p = .011$), indicating that higher levels of FoMO amplify the adverse effect of social media usage on sleep quality. Simple slope analyses revealed that for students with high FoMO, social media usage was strongly associated with poorer sleep quality ($\beta = 0.48$, $p < .001$), whereas for students with low FoMO, the association was weaker but still significant ($\beta = 0.24$, $p = .002$). These results support the hypothesized moderating role of FoMO.

Structural equation modeling (SEM) was conducted to further validate the proposed conceptual model. The model demonstrated satisfactory fit indices ($\chi^2/df = 2.21$, CFI = 0.95, TLI = 0.94, RMSEA = 0.058, SRMR = 0.046). All hypothesized paths were significant: social media usage positively predicted FoMO ($\beta = 0.42$, $p < .001$), FoMO positively predicted poor sleep quality ($\beta = 0.33$, $p < .001$), and social media usage had a direct effect on sleep quality ($\beta = 0.22$, $p < .001$). The indirect effect through FoMO was significant ($\beta = 0.14$, 95% CI [0.09, 0.19]), corroborating the mediation analysis.

Overall, the results indicate that social media usage is associated with poorer sleep quality among university students, and that FoMO functions both as a partial mediator and as a moderator in this relationship. These findings highlight the cognitive-emotional mechanism through which digital engagement influences physiological outcomes, emphasizing the importance of addressing FoMO in interventions designed to mitigate sleep disturbances among students.

5. Discussion and Conclusion

This study investigated the relationships among social media usage, Fear of Missing Out (FoMO), and sleep quality among university students, with a focus on the mediating and moderating roles of FoMO. The findings provide substantial empirical evidence that social media usage is positively associated with FoMO, which, in turn, negatively impacts sleep quality. Moreover, FoMO was found to amplify the detrimental effect of social media engagement on sleep, indicating that students with higher levels of FoMO are more susceptible to sleep disruption due to digital behaviors. These results underscore the intricate interplay between behavioral patterns, cognitive-emotional mechanisms, and physiological outcomes in the context of university students' daily lives.

The significant mediating effect of FoMO aligns with previous research (Przybylski et al., 2013; Elhai et al., 2016),

supporting the notion that cognitive-emotional factors explain a substantial portion of the relationship between social media engagement and adverse outcomes. The mediation suggests that excessive social media usage contributes to heightened FoMO, which generates anxiety, preoccupation, and compulsive online behaviors. These, in turn, interfere with normal sleep patterns by delaying bedtimes, increasing nocturnal awakenings, and reducing overall sleep duration and efficiency. The findings confirm the psychological mechanism through which behavioral engagement in digital environments translates into physiological consequences, emphasizing the importance of addressing cognitive-emotional drivers when designing interventions to mitigate negative outcomes.

The moderating role of FoMO further extends theoretical understanding by highlighting individual differences in vulnerability to social media-induced sleep disruption. Specifically, students experiencing higher levels of FoMO demonstrated a stronger negative relationship between social media usage and sleep quality. This finding is consistent with social cognitive theory, which posits that cognitive factors such as beliefs, expectations, and emotional responses interact with behavioral patterns to shape outcomes. It also suggests that interventions targeting sleep improvement should not solely focus on limiting screen time, but also address the underlying motivational and affective components that drive excessive engagement, such as anxiety related to missing social experiences and the compulsion to maintain online connectivity.

From a theoretical perspective, this study contributes to the integration of digital psychology, behavioral health, and cognitive-emotional theory in understanding the consequences of social media engagement. By empirically demonstrating both mediation and moderation effects, the study provides a nuanced framework for conceptualizing how digital behaviors translate into health-related outcomes. It highlights FoMO as a central cognitive-emotional mechanism, bridging the gap between technological engagement and physiological consequences, and reinforcing the importance of considering psychological processes in the study of digital behavior.

The practical implications of these findings are multifaceted. Universities and higher education administrators should implement strategies to raise awareness of FoMO and its impact on student well-being. Educational workshops focusing on time management, digital literacy, mindfulness, and stress reduction can help students regulate their social media engagement and mitigate its effects on sleep. Mental health services should incorporate assessments of FoMO and provide counseling interventions aimed at reducing compulsive online behaviors. Technological interventions, such as app usage tracking tools and notifications limiting nighttime engagement, can further support healthier patterns of digital interaction. Collectively, these measures can promote healthier behavioral habits, improve sleep quality, and enhance students' cognitive and emotional functioning.

Despite its contributions, the study has several limitations. First, the cross-sectional design precludes definitive causal conclusions. Although statistical analyses support the hypothesized relationships, longitudinal or experimental designs would be necessary to establish temporality and causality. Second, reliance on self-reported measures introduces potential biases, including social desirability, recall errors, and subjective interpretation of sleep quality and social media usage. Future studies could incorporate objective measures such as wearable sleep trackers or smartphone usage logs to enhance measurement validity. Third, the sample was drawn from a single university, which may limit generalizability to other cultural or institutional contexts. Subsequent research should involve multi-institutional sampling and consider cross-cultural comparisons to validate and extend the findings. Fourth, while FoMO was identified as a key mediating and moderating factor, other psychological constructs such as social anxiety, loneliness, or self-regulation were not examined and may further elucidate the mechanisms underlying the social media-sleep relationship.

Future research directions include exploring longitudinal dynamics to assess the causal pathways between social media usage, FoMO, and sleep quality. Experimental interventions aimed at reducing FoMO or limiting social media engagement could provide practical evidence for effective behavioral strategies. Additionally, investigating the role of personality traits, coping mechanisms, and cultural factors can further contextualize the impact of digital engagement on student health. Researchers may also consider examining the differential effects of specific social media platforms, types of content consumed, and usage patterns on sleep and psychological outcomes, providing a more granular understanding of digital behavior.

In conclusion, this study demonstrates that social media usage negatively affects sleep quality among university students, with FoMO serving both as a mediator and a moderator in this relationship. The findings underscore the critical role of cognitive-emotional mechanisms in linking digital engagement to physiological outcomes. From a theoretical standpoint, the study advances understanding of digital behavior and health psychology, integrating behavioral, cognitive, and emotional perspectives. Practically, the results offer guidance for interventions aimed at promoting healthy social media usage, reducing FoMO, and improving sleep quality, ultimately enhancing the well-being of university students. The study highlights the need for comprehensive, multi-level approaches that address behavioral patterns, underlying cognitive-emotional processes, and contextual influences, laying the groundwork for future research and evidence-based policy development.

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