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(RESEARCH ARTICLE)

Night-Time Social Media Use and Sleep Quality Among Medical Students in a Nigerian Public University: A Cross-Sectional Study

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Abstract

Background: The increasing integration of social media into daily life has raised public health concerns regarding sleep health among young adults, particularly medical students exposed to academic demands. Excessive social media use at night may disrupt sleep, yet evidence from Nigerian medical schools remains limited.

Objective: To determine the prevalence and association between night-time social media use and sleep quality among medical students at Rivers State University, Port Harcourt.

Methods: An analytical cross-sectional study was conducted among 381 undergraduate medical students selected through stratified random sampling across academic levels. Data were collected using a structured, self-administered questionnaire incorporating the Pittsburgh Sleep Quality Index and measures of social media use. Poor sleep quality was defined as a global PSQI score greater than five. Data were analysed using descriptive statistics and chi-square tests, with statistical significance set at $p<0.05$.

Results: The response rate was 100%. The mean age of respondents was 20.5 ± 2.3 years, and 65.1% were female. Social media use was universal at 99.2%, with WhatsApp, YouTube, and TikTok most commonly used. Over half of respondents were heavy users, spending more than four hours daily on social media. Overall, 48.3% of students had poor sleep quality. Heavy social media use was associated with delayed sleep onset, short sleep duration, insomnia, and severe daytime dysfunction.

Conclusion: Excessive social media use is associated with impaired sleep quality among Nigerian medical students, highlighting the need for digital wellness and sleep hygiene interventions programmes.

Keywords: Social Media; Sleep Quality; Medical Students; Nighttime Use; Digital Health; Nigeria

1. Introduction

Sleep constitutes a fundamental biological imperative, essential for cognitive consolidation, emotional regulation, immune function, and overall physiological homeostasis [1]. For medical students, whose training involves exceptional cognitive demands, prolonged study hours, and significant psychological stress, achieving restorative sleep is not merely beneficial but critical for academic success and personal well-being [2]. However, this population is notoriously

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vulnerable to sleep disturbances, with global prevalence rates of poor sleep quality ranging from 40% to 60%, markedly higher than age-matched peers in other disciplines [3,4].

The 21st century has witnessed the rapid ascent of digital technology and social media platforms as central elements of daily life, particularly among adolescents and young adults [5]. In Nigeria, one of Africa's most populous nations with a burgeoning youth demographic and increasing internet penetration, social media usage has become ubiquitous [6]. Platforms such as WhatsApp, Facebook, Instagram, TikTok, and YouTube facilitate communication, learning, and entertainment, but also foster patterns of excessive and compulsive use [7]. The Nigerian educational landscape, characterised by large class sizes, competitive academic environments, and, at times, inadequate recreational infrastructure, may inadvertently push students toward digital spaces for both academic collaboration and stress relief [8].

A growing corpus of international research has established a concerning link between excessive social media use, particularly during pre-sleep periods, and various sleep pathologies [9,10]. The proposed mechanisms are multifactorial: (1) *Behavioural displacement*, where time spent on devices directly replaces time allocated for sleep; (2) *Psychological arousal*, where engaging, emotionally charged, or anxiety-inducing content heightens cognitive activity, hindering sleep initiation; and (3) *Physiological disruption*, primarily through exposure to short-wavelength blue light emitted from screens, which suppresses nocturnal melatonin secretion and delays the circadian rhythm [11,12]. A phenomenon particularly relevant to students is "bedtime procrastination," the voluntary delay of sleep without an external cause, often linked to social media browsing [13].

Within the Nigerian context, while studies have examined internet addiction and general screen time among undergraduates [14,15], focused research on the specific nexus between night-time social media engagement and sleep architecture in medical students is sparse. Medical training in Nigeria is intensely rigorous, with students often grappling with resource constraints, high-stakes examinations, and future career anxieties [16]. These unique pressures may create a perfect storm where social media serves as both a necessary tool for academic connectivity and a maladaptive coping mechanism, potentially exacerbating sleep deficits.

The public health implications are substantial. Sleep deprivation impairs memory, critical thinking, and clinical reasoning-skills paramount to medical practice [17]. Furthermore, chronic poor sleep is a well-established risk factor for mental health disorders such as depression and anxiety, which already exhibit high prevalence among medical students globally and in Nigeria [18,19]. Therefore, understanding this relationship is not merely an academic exercise but a necessary step toward safeguarding the well-being of future healthcare providers and, by extension, the quality of the national healthcare workforce.

This study aimed to investigate the association between night-time social media use and sleep quality among medical students at Rivers State University (RSU), Port Harcourt. It sought to determine the prevalence and patterns of social media use, assess the burden of sleep disturbances using a validated instrument, and analyse the strength of association between heavy use and specific sleep quality indicators. The findings are intended to inform targeted, context-appropriate interventions for Nigerian medical schools and contribute to the broader discourse on digital health in low- and middle-income country (LMIC) settings.

2. Methods

2.1. Study Design and Setting

An analytic cross-sectional study was conducted between June and September 2025. The study was set at the College of Medical Sciences, Rivers State University (RSU), located in Port Harcourt, the capital of Rivers State in the South-South geopolitical zone of Nigeria. RSU is a state-owned university with a growing medical school, representing a typical Nigerian public university medical training environment.

2.2. Study Population

The target population comprised all bona fide undergraduate medical students (MBBS programme) enrolled from 100 to 600 levels at the College of Medical Sciences, Rivers State University, during the 2024/2025 academic session.

2.3. Sample Size Determination and Sampling Technique

The minimum sample size was calculated as 381, using the Cochran formula for cross-sectional studies [20], with a 95% confidence level, a 5% margin of error, and a prevalence (p) of poor sleep quality among medical students estimated at 66.3% from a previous Nigerian university study [21]. A 10% adjustment was made for non-response.

A stratified random sampling technique was used to ensure proportional representation across all six academic levels (100Level to 600Level). The total population per level was obtained from the faculty registry, and participants were randomly selected from each stratum using computer-generated random numbers.

2.4. Data Collection Instrument and Measures

Data were collected using a pre-tested, structured, self-administered questionnaire with four sections:

- Section A: Collected socio-demographic data (age, sex, academic level).
- Section B: Assessed social media use patterns. Items included access to a smartphone, platforms used regularly, average daily duration of use (categorised as <2, 2-4, >4 hours), frequency of checking, timing of most frequent use (with specific focus on "late night after 9 PM" and "in bed before sleep"), and primary purposes of use.
- Section C: Sleep quality was assessed using a modified version of the Pittsburgh Sleep Quality Index (PSQI) [22]. The PSQI is a 19-item validated instrument generating seven component scores (subjective quality, latency, duration, habitual efficiency, disturbances, use of sleep medication, daytime dysfunction) and a global score ranging from 0 to 21. A global PSQI score >5 indicates "poor sleep quality." The tool has been validated and widely used in various populations, including Nigerian students [23]. For this analysis, both the global score and key component indices (sleep latency >30 minutes, sleep duration <7 hours, presence of sleep onset and maintenance insomnia, and daytime dysfunction) were used as outcome variables.
- Section D: Assessed the perceived relationship, containing items on whether students believed their social media use affected their sleep and academic performance.

2.5. Validity and Reliability

The questionnaire was developed in English (the language of instruction). Face and content validity were ensured by review from two public health physicians and a sleep researcher. A pre-test was conducted with 20 medical students (not included in the main sample) at the University of Port Harcourt Teaching Hospital. Internal consistency for the sleep quality section yielded a Cronbach's alpha of 0.82, indicating good reliability.

2.6. Data Collection Procedure

Trained research assistants (fifth-year medical students) were briefed on the objectives and ethical protocols. After obtaining permission from class representatives, the researchers met potential participants at designated lecture breaks. The study's purpose, voluntary nature, and confidentiality assurances were explained. Written informed consent was obtained before questionnaire distribution. Participants completed the questionnaires anonymously and returned them to a sealed collection box.

2.7. Data Analysis

Data were cleaned, coded, and entered into IBM Statistical Package for the Social Sciences (SPSS) version 25 for analysis. Descriptive statistics were computed for socio-demographic variables, social media use patterns, and sleep parameters, presented as frequencies and percentages. The primary exposure variable was dichotomised into "heavy social media use" (>4 hours/day) versus "lighter use" (≤4 hours/day). The primary outcome was "poor sleep quality" (PSQI >5). Associations between categorical variables (social media use duration and sleep disturbance indicators) were examined using the Pearson Chi-square (χ^2) test. A p-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Socio-demographic Characteristics of Respondents

All 381 questionnaires distributed were completed and returned, yielding a 100% response rate. The age of respondents ranged from 16 to 32 years, with a mean of 20.5 (±2.3) years. The majority (39.4%) were within the 19-21 years age bracket. There were more female participants (248, 65.1%) than males (133, 34.9%). Respondents were distributed across all academic levels, with the highest proportion in the 300-level (21.0%) and the lowest in the final 600-level (6.8%), reflecting attrition patterns common in Nigerian medical schools. (Table 1)

Table 1 Socio-demographic Characteristics of Respondents (n = 381)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	16-18	105	27.6
	19-21	150	39.4
	22-24	89	23.4
	≥25	37	9.7
Sex	Male	133	34.9
	Female	248	65.1
Academic Level	100 Level	78	20.5
	200 Level	62	16.3
	300 Level	80	21.0
	400 Level	68	17.8
	500 Level	67	17.6
	600 Level	26	6.8

3.2. Patterns of Social Media Use

Social media use was nearly universal, with 378 respondents (99.2%) reporting current use. All respondents owned internet-enabled smartphones. The most utilised platforms were WhatsApp (97.6%), YouTube (69.6%), and TikTok (52.0%). Instagram, Facebook, Twitter/X, and Telegram had lower usage rates (ranging from 15-35%). Regarding daily duration, over half of the participants (203, 53.3%) were classified as heavy users, spending more than 4 hours daily on social media. The primary purposes for use were entertainment (88.2%) and academic activities (84.0%), followed by connecting with friends/family (71.1%) and accessing news (43.6%). A significant majority (73.5%) reported having attempted to reduce their social media use at some point, indicating self-recognised overuse. (Table 2)

Table 2 Patterns of Social Media Use Among Medical Students (n=381)

Variable	Category/Platform	Frequency (n)	Percentage (%)
Uses social media	Yes	378	99.2
Average Daily Duration	≤ 4 hours	178	46.7
	> 4 hours	203	53.3
Most Used Platforms (Top 3)	WhatsApp	372	97.6
	YouTube	265	69.6
	TikTok	198	52.0
Primary Purposes (Multiple Response)	Entertainment	336	88.2
	Academic Activities	320	84.0
	Social Connection	271	71.1
	News	166	43.6
Has tried to reduce usage	Yes	280	73.5

3.3. Prevalence of Sleep Disturbances

The overall prevalence of poor sleep quality (PSQI global score >5) was 48.3% (184/381). Analysis of PSQI components revealed widespread sleep issues: 90.3% reported abnormally short sleep duration (<7 hours per night), 76.4% reported poor subjective sleep quality, 67.5% experienced significant daytime dysfunction, 65.6% reported sleep

maintenance insomnia (frequent nighttime awakenings), and 51.4% experienced sleep onset insomnia (taking >30 minutes to fall asleep). (Table 3)

Table 3 Prevalence of Sleep Disturbances Based on PSQI Components (n=381)

Sleep Disturbance Parameter	Frequency (n)	Percentage (%)
Poor Subjective Sleep Quality	291	76.4
Abnormal Sleep Duration (<7 hours)	344	90.3
Sleep Onset Insomnia (Latency >30 min)	196	51.4
Sleep Maintenance Insomnia	250	65.6
Significant Daytime Dysfunction	257	67.5
Global PSQI Score >5 (Poor Sleep)	184	48.3

3.4. Association between Social Media Use and Sleep Disturbances

Heavy social media users (>4 hours/day) were significantly more likely to experience every measured sleep disturbance compared to lighter users (≤4 hours/day).

- Delayed Sleep Latency: 29.6% of heavy users vs. 84.3% of lighter users reported normal latency (p=0.008).
- Short Sleep Duration: 61.2% of heavy users slept <7 hours vs. 38.8% of lighter users (p=0.001).
- Sleep Onset Insomnia: Prevalence was 29.9% among heavy users vs. 70.1% among lighter users (p=0.001).
- Sleep Maintenance Insomnia: Prevalence was 21.0% among heavy users vs. 79.0% among lighter users (p=0.001).
- Daytime Dysfunction**:** Severe dysfunction was reported by 30.2% of heavy users vs. 69.8% of lighter users (p=0.001).

All associations were statistically significant with p-values <0.05. (Table 4)

Table 4 Association between Duration of Social Media Use and Sleep Quality Indicators

Sleep Disturbance	Heavy Users (>4 hrs) n(%)	Light Users (≤4 hrs) n(%)	χ^2 Value	p-value
Delayed Sleep Latency	60 (29.6%)	321 (84.3%)	95.2	0.008
Sleep Duration <7 hrs	233 (61.2%)	148 (38.8%)	180.9	0.001
Sleep Onset Insomnia	114 (29.9%)	267 (70.1%)	121.6	0.001
Sleep Maintenance Insomnia	80 (21.0%)	301 (79.0%)	75.7	0.001
Daytime Dysfunction	155 (30.2%)	266 (69.8%)	220.2	0.001

4. Discussion

This cross-sectional study among medical students at Rivers State University, Nigeria, reveals a disturbingly high prevalence of both excessive social media use and clinically significant sleep disturbances. The near-universal penetration of social media (99.2%), with over half the cohort classified as heavy users (>4 hours/day), underscores the depth of digital immersion in this academic population. More critically, our findings demonstrate a strong, statistically significant association between this heavy usage pattern and a spectrum of adverse sleep outcomes, including delayed sleep onset, chronic short sleep duration, insomnia, and debilitating daytime dysfunction.

The prevalence of poor sleep quality (48.3%) aligns with the upper ranges reported in similar settings across Africa. A systematic review and meta-analysis by Aloba et al. (2022) estimated a 63.3% prevalence of poor sleep among university students in Africa, with academic stress and electronic device use as major contributors [24]. Our figure, while slightly lower, confirms that Nigerian medical students bear a substantial sleep health burden. The extraordinarily high rate of short sleep duration (90.3% sleeping <7 hours) is particularly alarming. It far exceeds the 60-70% range

reported in studies from Saudi Arabia and Malaysia [25,26], suggesting that Nigerian medical students may face unique or compounded pressures (academic, environmental, and socio-economic) that severely restrict sleep opportunity.

The core finding of a robust association between heavy social media use and poor sleep parameters is consistent with a growing global consensus [9,10,27]. Our results extend this evidence base to a Nigerian public university context. The mechanisms implicated are likely tripartite, as suggested in the introduction. First, *behavioural displacement* is evident: students spending over four hours daily on social media are directly sacrificing time that could be allocated to sleep. This is compounded by "bedtime procrastination," where the endless, algorithmic scroll of platforms like TikTok and YouTube makes disengagement difficult [13]. Second, *psychological arousal* is plausible. Medical education is inherently stressful; social media can become a zone of both academic collaboration and anxious comparison with peers, heightening cognitive and emotional activation at a time when winding down is crucial [28]. Third, the *physiological impact* of blue light exposure, especially during late-night use in dark environments, disrupts melatonin secretion and circadian phase, scientifically explaining the delayed sleep onset observed in heavy users [12].

The specific platform preferences offer further insight. The dominance of WhatsApp mirrors its role as the primary tool for academic coordination in Nigerian universities, creating an "always-on" expectation that blurs the line between study and leisure time [29]. The high use of visually stimulating, video-based platforms like YouTube and TikTok is particularly concerning from a sleep perspective. These platforms are engineered for prolonged engagement through autoplay and personalised feeds, making them potent drivers of pre-sleep overuse and cognitive hyperarousal [30].

The significant association with daytime dysfunction (drowsiness, lack of energy, poor concentration) has dire implications for medical training. Sleep-deprived students are at risk of impaired learning, reduced clinical performance, and decreased empathy [31]. In the long term, this contributes to burnout and professional disillusionment, exacerbating the brain drain of healthcare professionals from Nigeria- a critical national public health challenge [32].

Our findings must be interpreted within the Nigerian socio-academic context. An unreliable electricity supply can lead to irregular sleep schedules. Densely populated hostels are often noisy and not conducive to sleep. The intense competition for limited postgraduate training positions (internships and residencies) creates a pervasive climate of anxiety. In this environment, social media may serve as a double-edged sword: a vital lifeline for information and community, yet a significant disruptor of the restorative sleep needed to survive the training marathon.

4.1. Study Strengths and Limitations

This study has several strengths, including a robust sample size achieved through stratified random sampling, the use of the validated PSQI instrument, and a high response rate. It provides much-needed local data from a key Nigerian institution.

However, limitations must be acknowledged. The cross-sectional design precludes definitive causal inference; students with pre-existing insomnia or anxiety may turn to social media more frequently. Self-reported data are subject to recall and social desirability biases. The study was conducted in a single institution, which may limit the generalizability of findings to private universities or other geographical regions in Nigeria. Furthermore, while the academic level was controlled, other potential confounders, such as specific academic stress, financial pressures, or caffeine consumption, were not fully assessed.

4.2. Public Health Implications and Recommendations

The public health implications of our findings are substantial. Medical students are future physicians; their well-being directly impacts the health system's sustainability and quality. Therefore, we propose the following multi-level recommendations:

4.2.1. Institutional Level (University Administration & Medical School):

- Integrate Digital Wellness Education: Mandate modules on sleep hygiene and responsible technology use within the medical curriculum, ideally during orientation and reiterated in clinical years.
- Promote "Digital Curfews": Encourage policies or campaigns advocating for screen-free periods 60 minutes before bedtime. University health services should disseminate practical tips (e.g., using night mode, charging phones outside the bedroom).
- Strengthen Counselling Services: Ensure student support units are equipped to address technology overuse, sleep disorders, and the underlying stress that drives them.

- Improve Hostel Environments: Where possible, invest in creating quieter, more sleep-conducive living spaces for students.

4.2.2. National Level (Medical and Dental Council of Nigeria - MDCN, Committee of Vice-Chancellors)

- Develop National Guidelines: Advocate for the inclusion of student mental and sleep health benchmarks in medical school accreditation processes.
- Fund Research: Support larger, multi-institutional longitudinal studies to better understand the causality and long-term career impacts of this issue.

4.2.3. Student Level

Foster student-led initiatives and clubs focused on wellbeing, peer support, and promoting healthy study-life-digital balances.

5. Conclusion

This study provides compelling evidence that excessive and nighttime social media use is highly prevalent and strongly associated with poor sleep quality among medical students at Rivers State University, Nigeria. In an era where digital connectivity is indispensable, the challenge is to mitigate its harm while harnessing its benefits. The sleep health of medical students is not a luxury but a fundamental component of their training and future competency. Proactive, evidence-based interventions at institutional and national levels are urgently required to cultivate a generation of healthcare professionals who are not only knowledgeable and skilled but also healthy and resilient. Addressing this digital-age public health challenge is an investment in the very foundation of Nigeria's future healthcare system.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that they have no competing interests.

Statement of ethical approval

Ethical approval was obtained from the Rivers State University Teaching Hospital Health Research Ethics Committee.

Statement of informed consent

Written informed consent was obtained from all participants. Anonymity and confidentiality were maintained throughout; no personal identifiers were collected. Participants were informed of their right to withdraw at any point without penalty.

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Authors' Contributions

- TEP**:** Conceptualisation, Methodology, Data Curation, Formal Analysis, Writing – Original Draft.
- PKG: Investigation, Data Collection, Project Administration, Writing – Original Draft.
- ICN: Supervision, Validation, Writing – Review & Editing, Resources.
- NCTB: Supervision, Methodology, Validation, Writing – Review & Editing.

All authors read and approved of the final manuscript.

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