

NIGHT-TIME SOCIAL MEDIA USE AND ITS ASSOCIATION WITH SLEEP QUALITY AMONG UNDERGRADUATE MEDICAL STUDENTS

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ABSTRACT

Background: Medical students have high rates of sleep disturbances that can be affected by various lifestyle factors, including night-time social media use. The objective is to evaluate sleep quality and night-time social media use among undergraduate medical students. **Materials and Methods:** We surveyed 484 medical students using a questionnaire focusing on sociodemographics, sleep quality and night-time social media use. Social media and sleep quality were scored using Likert-scale items and sleep quality was dichotomised using the median cut-off. Descriptive statistics, t-test, ANOVA and Chi-square test, Pearson correlation test and logistic regression were used for data analysis. A p-value <0.05 was considered significant. **Result:** The mean age was 20.02 ± 1.48 years, and 67.4% were females. The mean hours of sleep per night was 6.73 ± 1.09 hours, and 45.7% had poor sleep quality. The average night-time social media use was 1.58 ± 1.05 hours, with 44.8% having problematic use. There was a moderate positive association between social media use and poor sleep ($r = 0.40$, $p < 0.001$). Problematic social media use and social media use for more than 2 hours during the night were both significantly associated with poor sleep. A logistic regression model indicated problematic social media use was independently associated with poor sleep (OR = 3.29; 95% CI: 2.20-4.91; $p < 0.001$). **Conclusion:** Medical students experience poor sleep quality, which is linked with night-time use of social media. Modifying digital behaviours may improve sleep.

INTRODUCTION

Sleep is a fundamental physiological process essential for optimal physical health, cognitive performance, and emotional well-being.^[1] Adequate sleep plays a crucial role in consolidation of memory, learning, and decision-making, all of which are particularly important for medical students.^[2,3] However, sleep disturbances are increasingly common among young adults, especially students in demanding academic environments.^[4] Medical students are particularly vulnerable to poor sleep due to academic stress, irregular schedules, and various lifestyle factors. Studies conducted in India and elsewhere have reported a high prevalence of poor sleep quality among medical students, despite apparently adequate sleep duration. Poor sleep quality has been associated with adverse outcomes such as reduced academic performance, impaired

concentration, mood disturbances, and increased risk of mental health problems.^[4-6]

In recent years, the rapid proliferation of smartphones and digital platforms has significantly altered sleep-related behaviours. Night-time use of electronic media, particularly social media, has emerged as an important behavioural factor affecting sleep.^[7] Platforms such as Instagram, YouTube, and others are widely used by young adults, often extending into late-night hours.^[1,8] Evidence suggests that increased screen time before bedtime is associated with delayed sleep onset, reduced sleep duration, and poorer sleep quality.^[1,9] The mechanisms underlying this association are multifactorial. Exposure to blue light emitted from screens can suppress melatonin secretion and disrupt circadian rhythms, thereby delaying sleep initiation.^[10] In addition, psychological factors such as heightened cognitive arousal, emotional engagement, and fear of missing

out (FOMO) may further contribute to sleep disturbances.^[11,12] Problematic or excessive use of social media has also been linked to sleep problems and behavioural addiction patterns.^[1]

Recent research indicates that long term disruption of sleep impacts executive functioning in areas regulated by the prefrontal cortex such as focus, working memory, and decision making which are key skills in medical education.^[13] The mechanisms of intermittent reinforcement in social media serve to release dopamine in individuals' brains leading to addictive behaviours.^[14]

Irregular sleep-wake habits triggered by late night activities involving electronics could give rise to 'social jet lag', a condition where one's biological clock doesn't align with socially imposed schedules.^[12,15]

Sleep disturbance and social media usage probably have a bidirectional association wherein disrupted sleep leads to increased device usage at night, which exacerbates the problem.^[16,17]

In view of ubiquity of cell phone usage in India, and the increasing dependence on technology by college students, there is an important public health relevance to understanding behaviour associated with sleep disorders.^[18,19]

Despite growing evidence globally, there is limited data from India examining the combined effect of night-time social media use and sleep quality among medical students, particularly using comprehensive behavioural assessment tools.^[20] Understanding this relationship is important in the context of increasing digital engagement and its potential impact on student health. Therefore, the present study was undertaken to assess the pattern of night-time social media use and its association with sleep quality among undergraduate medical students in a private medical college in Andhra Pradesh, India.

Objectives

1. To assess night-time social media usage patterns among undergraduate medical students
2. To assess sleep quality among undergraduate medical students
3. To identify the association between nighttime social media usage patterns and sleep quality among undergraduate medical students.

MATERIALS AND METHODS

A cross-sectional observational study was carried out in the undergraduate medical students at NRI Medical College, a private medical college in Guntur district of Andhra Pradesh, India for two months (December 2025 to January 2026). The study included all undergraduate medical students from First MBBS, Second MBBS, Final MBBS Part I and Part II aged ≥ 18 years and consenting to participate. Those who did not consent, had incomplete questionnaires or a history of chronic illness, acute severe illness, or psychiatric illness were excluded. A

total of 484 students were analysed. The study was approved by the Institutional Ethics Committee before the start of the study. Participants gave informed consent for data collection. Confidentiality and anonymity were ensured.

Study Tool and Data Collection: A pre-tested, semi-structured, self-administrated questionnaire with several sections was used to gather data. Sociodemographic information comprised age, sex, year of study and housing type (on-campus and off-campus). Sleep quality was measured using a 9-item Likert scale that included items relating to sleep latency, night awakenings, early morning awakening, daytime sleepiness, fatiguability, and subjective sleep quality, with each item graded from 1 (never) to 5 (always), with a higher score reflecting worse sleep quality. Evening social media use was assessed using an 11-item Likert scale (1 = never to 5 = always), and additional items on the type of social media sites used and the time spent using social media after 9 PM; a total score was computed, with higher scores indicating higher usage and problematic use. Physical activity was evaluated using a single question on the frequency of moderate-to-vigorous physical activity (MVPA) for at least 30 minutes per day during the last 30 days, and categories of low (≤ 1 day/week), moderate (2-3 days/week) and high (≥ 4 days/week) physical activity were created.

Four subject matter experts from the institution were involved for content validity assessment of the questionnaire, which mainly dealt with the relevance and clarity of the questionnaire. The questionnaire was revised accordingly. The questionnaire was evaluated in a pilot study involving 30 students, to check for clarity and time needed for completion. They were not included in the study. The final questionnaire was distributed online via Google Forms. The participants were asked to fill out the questionnaire, and the data were collected online. Those scoring higher than the median on the social media usage score were considered to have problematic social media use. Likewise, participants with a score above the median sleep quality score were classified as having poor sleep quality.

Statistical Analysis: Data were coded into Microsoft Excel. Statistical Package for Social Sciences (SPSS) version 25 was used for statistical analysis. Continuous variables were reported as mean $\pm$ standard deviation and median (IQR) and categorical variables were reported as frequency and percentage. Pearson correlation was used to examine the relationship between sleep quality and sleep-related use of social media. The mean difference in sleep quality was tested using independent samples t-test and one-way ANOVA. Chi-square test was used to assess associations with categorical variables. Independent predictors of poor sleep quality were determined using multiple binary logistic regression analysis. It was presented as odds ratio (OR) with 95% confidence interval (CI). p-value < 0.05 was considered significant.

RESULTS

We recruited 484 undergraduate medical students for the study. Of these, 326 (67.4%) were females and 158 (32.6%) were males. The average age of the students was 20.02 ± 1.48 years. Regarding academic distribution, 133 (27.5%) were in the first professional year, 130 (26.9%) in the second year, 169 (34.9%) in the third year, and 52 (10.7%) in the fourth year. Most of the participants (300, 62%) were day scholars, and 184 (38%) were living in hostels. Physical activity levels varied with 207 (42.8%) of the sample having low, 142 (29.3%) having moderate, and 135 (27.9%) having high levels of moderate-to-vigorous physical activity [Table 1].

Sleep Characteristics: Most participants (396, 81.8%) reported sleeping 6–8 hours per night, while 60 (12.4%) slept 4–6 hours. The mean sleep duration was 6.73 ± 1.09 hours with a range of 4–12 hours. The median duration of sleep was 7 hours (IQR: 6–7 hours). The mean sleep quality score was 23.7 ± 6.77 , with a median of 24 (IQR: 19–29). Using the median as the cut-off, 221 (45.7%) of the students were classified as having poor sleep quality, while the remaining 263 (54.3%) had good sleep quality [Table 1].

Night-time Social Media Use: Instagram was the most popular social media platform used during the night-time (364 users), followed by YouTube (257 users) and Snapchat (56 users). Other social media included X (34 users), WhatsApp (12 users) and Facebook (9 users), with 12 students using other social media platforms. Most students (151, 31.2%) indicated they spent 1–2 hours on social media after 9 PM before going to bed, and 91 (18.8%) spent over 2 hours. Few (15, 3.1%) reported no usage during the night. The average night-time social media use time among all the students was 1.58 ± 1.05 hours, with a median of 1.13 hours (IQR: 1–2 hours). The mean usage among users was 1.63 ± 1.02 hours (range: 5

minutes) to 6.5 hours, with a median of 1.5 hours (IQR: 1–2 hours). The mean social media usage score was 33.16 ± 7.42 (range: 11–55), with a median of 34 (IQR: 28–38). A total of 217 students (44.8%) were considered to have problematic social media use [Table 2].

Association Between Social Media Use and Sleep Quality During Night-time: The correlation between the night-time social media usage score and sleep quality score was moderate positive ($r = 0.40$, $p < 0.001$), suggesting that the more time spent using social media during night-time, the worse the sleep quality [Figure 1]. A statistically significant difference was found in the mean sleep quality score between students with problematic and non-problematic social media use ($p < 0.001$). Likewise, students with greater night-time social media use scores had poorer sleep quality ($p < 0.001$). But there were no statistically significant differences in the mean sleep quality scores with Gender, Professional year of study, Residence and Physical activity (using independent samples t-test and one-way ANOVA) [Table 3].

When Chi-square test was applied, poor sleep quality was found to be significantly associated with Problematic social media use ($p < 0.001$) and Night-time social media use > 2 hours ($p < 0.05$). There were no associations found with Gender, Professional year, Residence and Physical activity [Table 4]. Binary logistic regression was carried out to predict poor sleep. The model was statistically significant ($p < 0.001$), accounted for 12.2% of variance in sleep quality (Nagelkerke $R^2 = 0.122$) and had a good model fit (Hosmer-Lemeshow $p = 0.852$). Problematic social media use was found to be a predictor of poor sleep. Students with problematic social media use had 3.29 times higher odds of experiencing poor sleep (OR = 3.288; 95% CI: 2.201–4.912; $p < 0.001$). Other variables were not significantly associated with poor sleep [Table 5].

Table 1: Sociodemographic and Sleep Characteristics of Study Participants (n = 484)

Characteristic	Frequency	Percentage
Gender		
Male	158	32.6%
Female	326	67.4%
Academic year		
I Professional year	133	27.5%
II Professional year	130	26.9%
III Professional year part I	169	34.9%
III Professional year part II	52	10.7%
Residence		
Off campus	300	62%
On campus	184	38%
Physical activity level		
Low (Never/Rarely)	207	42.8%
Moderate (2–3 days/week)	142	29.3%
High (≥ 4 days/week)	135	27.9%
Sleep duration (hours/night)		
4–6	60	12.4%
6–8	396	81.8%
> 8	28	5.8%
Sleep quality		
Good	263	54.3%
Poor	221	45.7%

Sleep summary statistics	Mean $\pm$ SD	Median (IQR)	Range
Sleep duration (hours)	6.73 $\pm$ 1.09	7 (6–7)	4–12
Sleep quality score	23.7 $\pm$ 6.77	24 (19–29)	9–45

Table 2: Pattern of Night-time Social Media Use Among Study Participants (n = 484)

Characteristic	Frequency	Percentage	
Duration of Nighttime social media use (after 9 PM)			
No nighttime use	15	3.1%	
Less than 1 hour	227	46.9%	
1-2 hours	151	31.2%	
More than 2 hours	91	18.8%	
Platform (multiple responses)			
Instagram	364	75.2%	
YouTube	257	53.1%	
Snapchat	56	11.6%	
X	34	7.0%	
WhatsApp	12	2.5%	
Facebook	9	1.9%	
Others	12	2.5%	
Nighttime social media use			
Problematic	217	44.8%	
Non-problematic	267	55.2%	
Social Media Usage Summary statistics	Mean $\pm$ SD	Median (IQR)	Range
Night-time usage (all students, hours)	1.58 $\pm$ 1.05	1.13 (1–2)	0–6.5
Night-time usage (users only, hours)	1.63 $\pm$ 1.02	1.5 (1–2)	0.08–6.5
Social media usage score	33.16 $\pm$ 7.42	34 (28–38)	11–55

Table 3: Comparison of Mean Sleep Quality Scores Across Study Variables (n=484)

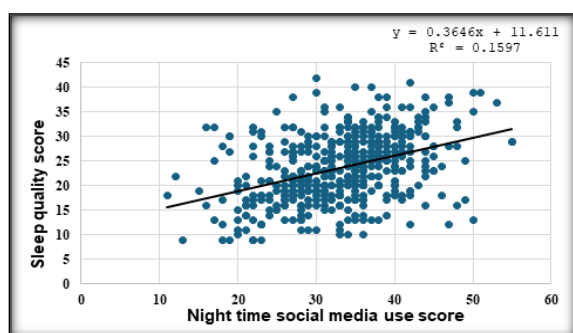
Characteristic	Mean $\pm$ SD	P value
Nighttime Social media use		
Problematic	26.14 $\pm$ 6.34	< 0.001
Non-problematic	21.72 $\pm$ 6.47	
Duration of Nighttime social media use		< 0.001
$\leq$ 2 hours	23.02 $\pm$ 6.783	
More than 2 hours	26.64 $\pm$ 5.919	
Gender		0.679
Male	23.52 $\pm$ 6.62	
Female	23.79 $\pm$ 6.86	
Academic year		0.567
I Professional year	23.25 $\pm$ 6.930	
II Professional year	24.03 $\pm$ 6.906	
III Professional year part I	24.05 $\pm$ 6.560	
III Professional year part II	22.92 $\pm$ 6.776	
Residence		0.094
Off campus	24.11 $\pm$ 6.841	
On campus	23.04 $\pm$ 6.625	
Physical activity level		0.491
Low (Never/Rarely)	24.13 $\pm$ 6.749	
Moderate (2-3 days/week)	23.44 $\pm$ 6.395	
High ($\geq$ 4 days/week)	23.33 $\pm$ 7.197	

Table 4: Association Between Study Variables and Sleep Quality (n=484)

Characteristic	No. of students with Poor sleep quality (total=221)	χ^2 value & P value
Nighttime Social media use		
Problematic	134 (61.8%)	$\chi^2 = 41.044$
Non-problematic	87 (32.6%)	p < 0.001
Duration of Nighttime social media use		
$\leq$ 2 hours	168 (42.7%)	$\chi^2 = 7.149$
More than 2 hours	53 (58.2%)	p = 0.008
Gender		
Male	71 (44.9%)	$\chi^2 = 0.050$
Female	150 (46.0%)	p = 0.824
Academic year		
I Professional year	59 (44.4%)	$\chi^2 = 0.941$
II Professional year	58 (44.6%)	p = 0.816
III Professional year part I	82 (48.5%)	
III Professional year part II	22 (42.3%)	
Residence		
Off campus	143 (47.7%)	$\chi^2 = 1.279$
On campus	78 (42.4%)	p = 0.258
Physical activity level		
Low (Never/Rarely)	101 (48.8%)	$\chi^2 = 1.557$
Moderate (2-3 days/week)	63 (44.4%)	p = 459
High ($\geq$ 4 days/week)	57 (42.2%)	

Table 5: Multiple Binary Logistic Regression Analysis for Predictors of Poor Sleep Quality (n = 484)

Characteristic	No. of students with Poor sleep quality (total=221)	OR (Confidence interval)	p value
Nighttime Social media use			
Problematic	134 (61.8%)	1(ref.)	
Non-problematic	87 (32.6%)	3.288 (2.201 - 4.912)	p = 0.001
Duration of Nighttime social media use			
≤ 2 hours	168 (42.7%)	1(ref.)	
More than 2 hours	53 (58.2%)	0.830 (0.496 - 1.388)	p = 0.477
Gender			
Male	71 (44.9%)	1(ref.)	
Female	150 (46.0%)	0.951 (0.622 - 1.456)	p = 0.819
Academic year			
I Professional year	59 (44.4%)	1(ref.)	
II Professional year	58 (44.6%)	1.220 (0.611 - 2.435)	p = 0.574
III Professional year part I	82 (48.5%)	1.317 (0.658 - 2.637)	p = 0.437
III Professional year part II	22 (42.3%)	1.446 (0.741 - 2.819)	p = 0.279
Residence			
Off campus	143 (47.7%)	1(ref.)	
On campus	78 (42.4%)	1.276 (0.856 - 1.902)	p = 0.231
Physical activity level			
Low (Never/Rarely)	101 (48.8%)	1(ref.)	
Moderate (2-3 days/week)	63 (44.4%)	1.272 (0.772 - 2.097)	p = 0.345
High (≥ 4 days/week)	57 (42.2%)	1.277 (0.765 - 2.130)	p = 0.350

**Figure 1: Correlation Between Night-time Social Media Use and Sleep Quality Scores (n=484)**

DISCUSSION

The current study examined the relationship between night-time social media usage and sleep quality among medical undergraduates and revealed a high frequency of poor sleep quality (45.7%), with problematic social media use identified as a predictor of poor sleep quality. The mean duration of sleep in this study was 6.73 ± 1.09 hours, and most students (81.8%) reported 6-8 hours of sleep. While this seems sufficient in terms of duration, almost half (45.7%) of the students reported poor sleep quality, suggesting that sleep quality is not adequate even with adequate sleep duration.^[4,21] This has also been observed in Indian college and medical students with a high prevalence of poor sleep quality. This suggests the need to evaluate the qualitative aspects of sleep, as advocated by standard sleep measures such as the Pittsburgh Sleep Quality Index. Social media usage was widespread, with only 3.1% of students reporting no usage after 9 PM. Instagram and YouTube were the most frequently used media, in line with current trends in young adult media use. Indian and international studies have demonstrated high prevalence of night-time use of electronic media.^[12,22] The average night-time use (1.58 hours)

and the prevalence of nearly one-fifth of students who spent over 2 hours on social media before bedtime suggest a significant exposure of social media during a sensitive period for sleep initiation. Further, 44.8% of students were identified as having problematic social media use, which resonates with Indian studies that point to growing digital addiction in youth.

The disjunction between sleep quantity and sleep quality points to the problem inherent in the reliance on quantified sleep alone, underscoring the need for multidimensional sleep assessment instruments.^[23] Different chronotypes could contribute to susceptibility to nocturnal social networking use, particularly for those with an evening preference who are more susceptible to delayed bedtime and screen time.^[1,24]

There was a moderate positive correlation ($r = 0.40$) between night-time social media use and poor sleep quality, suggesting greater social media usage is linked to poorer sleep quality. This finding is in line with other international and Indian studies that have shown a strong association between social media use and sleep quality among young adults.^[1,12,17] This could be due to multiple factors. The use of screen-based devices prior to sleep can lead to delayed sleep onset, melatonin suppression, and circadian rhythm disruption due to blue light exposure.^[10] And over-engagement, emotional arousal, and fear of missing out (FOMO) can also contribute to delaying sleep and resulting in poor sleep quality. This implies that social media use in the evening may be a more prominent and modifiable risk factor for poor sleep among this group. This is consistent with Indian research where lifestyle and behavioural factors had a greater impact on sleep quality than demographic factors.

Sleep deprivation among medical students could impact academic results negatively, leading to inefficient performance in clinical postings and

increased likelihood of making medical mistakes. With regards to India, issues like Hostel accommodation, academic competition and availability of affordable internet access would serve to intensify nighttime screen usage even further.^[25] Psychological moderators like stress, anxiety, and depression might partly account for the link between social media consumption and sleep disruptions, serving as potential confounders or moderators.^[26,27] The binary logistic regression analysis showed problematic social media use as an independent predictor of poor sleep, with students experiencing this condition having more than three times the odds (OR = 3.29) of poor sleep quality. This aligns with Indian and international studies that found excessive internet and social media use to be a predictor of poor sleep.^[28] However, the model only accounted for 12.2% of the variance, suggesting other factors such as academic stress, mental health issues, caffeine consumption, and the environment could contribute to poor sleep quality.^[17,27] The relatively low Coefficient of Determination of the regression model implies that sleep quality can be explained by many other factors apart from digital activities.^[29] Self-reports tend to suffer from reporting biases leading to either underestimations or overestimations of the amount of social media usage and/or sleep disturbances.^[9]

CONCLUSION

This study shows a high proportion of medical students suffer from poor sleep quality, and nighttime social media use, especially problematic use, is associated with and predicts poor sleep. Strategies such as educating about sleep hygiene, avoiding screen use before bedtime and digital well-being can potentially improve sleep quality and duration.

The implementation of measures that modify behaviours such as nighttime social media consumption could be seen as a feasible solution to promote better sleep amongst medical students. Digital hygiene programs and sleep education can be included as a part of wellness initiatives for students within medical institutions.

Further research is required to determine the cause-and-effect relationship and to assess the efficacy of targeted behavioural therapies. It is imperative that the sleep health of medical students must be optimised not just for their own benefit but also for the sake of their future patients.

The dataset generated and analysed during the current study is available in Mendeley data repository (DOI: 10.17632/h64vykv9yd.1).^[30]

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