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Exploring the Relationship Between Social Media Usage and Sleep Disorders Among College Student in Dhaka City, Bangladesh

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Abstract

Background:
Sleep plays a vital role in adolescents' physical and mental health. Yet, many young people fail to get adequate rest: globally, insufficient sleep, unrefreshing awakenings, and difficulty falling asleep are widespread. In Bangladesh, social media platforms—especially Facebook, WhatsApp, Instagram, Snapchat, forums, microblogs, and blogs—are extremely popular among youth. However, excessive social media use has been linked to worsened sleep quality and increased depressive symptoms in students both in Bangladesh and internationally.

Objective:
The objective of this study is to examine how the frequency and patterns of social media use among college students in Dhaka are associated with sleep quality—assessed using a validated instrument such as the PROMIS Sleep Disturbance or Pittsburgh Sleep Quality Index—and depressive symptoms. It aims to identify the most commonly used platforms, evaluate their direct and indirect relationships with sleep disturbances and mood, and determine whether impaired sleep mediates the link between social media engagement and depression within this cohort.

Method:
A cross-sectional study was conducted from July 2024 to October 2024 using a questionnaire that included the DASS-21 scale, along with socio-demographic, lifestyle, and academic factors to collect data. A total of 279 adolescents (aged 12–19) participated, with a mean age of 17 years (SD = 1.84). Descriptive analysis, as well as bivariate and multivariate linear regression, was performed to examine the associations between variables. Statistical analyses were conducted using Windows-based computer software, specifically the Statistical Package for the Social Sciences (SPSS) version 20.

Result:
Of the 279 college students analyzed (median daily social media use: 65.5 minutes, IQR 30–135), 39.1% experienced low, 28.3% medium, and 32.6% high sleep disturbance. While demographic factors like age, gender, residence, family type, and parental education did not significantly influence sleep quality, higher family income (>60,000 BDT) and being in a relationship were associated with greater disturbance. Predominantly, 71% used Facebook, 55% Instagram, 45% Twitter, and 20% other platforms, with Twitter users showing a marked male majority. Crucially, higher daily social media use (31–60 min: OR ≈8.1; 61–120 min: OR ≈7.6; 120+ min: OR ≈11.4), more frequent weekly visits (3–6 days: OR ≈5.6; daily: OR ≈10.7), and usage before bedtime (sometimes: OR ≈10.6; often: OR ≈12.9) were all strongly linked to elevated odds of sleep disturbance—outweighing demographic influences and suggesting a clear dose-response relationship.

Conclusion:
This study fills a critical gap by examining how both the **volume** and **frequency** of social media use are linked to sleep disturbances among college-aged adolescent students in Dhaka group in the formative "emerging adulthood" stage, when habits solidify. We found a clear, dose–response association: higher daily use, more frequent visits, and bedtime usage all significantly increased the odds of sleep disruption. Despite limitations—cross-sectional design, self-reported measures, and a narrow age range—these findings highlight the growing influence of social media on sleep health in young adults. They underscore the need for longitudinal studies and interventions aimed at healthier engagement with social media to protect sleep and well-being.

Introduction

Proper circadian functioning and sleep are essential for maintaining good health. While 7–9 hours of sleep is recommended for young and middle-aged adults, nearly 40% of Americans report sleeping less than 7 hours on weeknights; additionally, 38% wake up feeling unrefreshed and 21% experience difficulty falling asleep multiple times per week. Among adults aged 19–29, 67% report insufficient sleep to function optimally [1-3]. Sleep deprivation is linked to daytime fatigue, impaired cognitive

performance, mood disturbances, weakened immunity, cardiovascular risk, and metabolic issues [4-10].

Various biological, psychological, and environmental factors—such as shifts in circadian rhythms, academic pressures, substance use, and screen exposure—contribute to poor sleep among adolescents and young adults [11-14]. However, less attention has been paid to social media (SM) use, which encompasses platforms and applications that facilitate content sharing and communication [15-18]. Globally, over half of adults use SM, with use on the rise in Bangladesh—particularly on Facebook, WhatsApp, Viber, Snapchat, and Instagram—among youths [19-20].

Depression, a major global burden, often emerges in early adulthood and frequently co-occurs with sleep issues [21-22]. Research has linked excessive use of digital media—including SM usage—to greater depressive symptoms and reduced well-being among adolescents and young adults [23-25]. Although initial studies focused on "Facebook addiction" [26-29], recent work has broadened the scope to problematic

SM use (PSMU), characterized by excessive concern and time spent on SM to the detriment of daily functioning and mental health [30-32].

Results

We collected data from 384 college students as originally planned. After excluding 50 incomplete responses and 36 participants who did not provide consent, our final analytical sample consisted of 279 students. Table 1 presents the demographic and baseline characteristics of this weighted sample. All participants reported both daily social media use (in minutes) and weekly visit frequency. The median daily usage was 65.5 minutes, with an interquartile range of 30 to 135 minutes.

Due to the non-normal distribution of sleep disturbance scores, participants were categorized into three groups: low, medium, and high disturbance. Of the 279 students, 39.1% fell into the low-disturbance category, 28.3% into the medium, and 32.6% into the high-disturbance group.

Table 1: Participants characteristics and bivariate associations with sleep disturbance (n = 279)

Independent Variable	Sleep Quality			P value
	Low Disturbance (n = 109)	Medium Disturbance (n = 79)	High Disturbance (n = 91)	
Age				
18-20 years	53. (38.7%)	38 (27.7%)	46. (33.6%)	0.388
21-23 years	32 (37.2%)	30 (34.9%)	24 (27.9%)	
24 years and above	24 (42.9%)	11 (19.6%)	21 (37.5%)	
Sex				
Male	64 (39.5%)	45 (27.8%)	53 (32.7%)	0.971
Female	45 (38.5%)	34 (29.1%)	38 (32.5%)	
Permanent Residence				
Village Area	68 (37.4%)	53 (29.1%)	61 (33.5%)	.726
City Area	41 (42.3%)	26 (26.8%)	30 (30.9%)	
Family Type				
Nuclear Family	83 (36.7%)	68 (30.1%)	75 (33.2%)	0.211
Joint Family	26 (49.1%)	11 (20.8%)	16 (30.2%)	
Educational level of Father				
≤ 12 years	52 (39.4%)	36 (27.3%)	44 (33.3%)	0.931
> 12 years	57 (38.8%)	43 (29.3%)	47 (32.0%)	
Educational level of Mother				
≤ 12 years	77 (42.3%)	47 (25.8%)	58 (31.9%)	0.267
> 12 years	32 (33.0%)	32 (33.0%)	33 (34.0%)	
Family Income (Monthly)				
< 40,000 BDT	80 (45.2%)	46 (26.0%)	51 (28.8%)	**0.006**
40,000–60,000 BDT	20 (32.8%)	23 (37.7%)	18 (29.5%)	
> 60,000 BDT	9 (22.0%)	10 (24.4%)	22 (53.7%)	
Relationship Status				
In a relationship	41 (30.6%)	44 (32.8%)	49 (36.6%)	**0.020**
Single	68 (46.9%)	35 (24.1%)	42 (29.0%)	
Smoking Habit				
No	78 (41.3%)	54 (28.6%)	57 (30.2%)	0.401
Yes	31 (34.4%)	25 (27.8%)	34 (37.8%)	
Physical Exercise				
No	57 (34.5%)	49 (29.7%)	59 (35.8%)	0.165
Yes	52 (45.6%)	30 (26.3%)	32 (28.1%)	
Social Media Use				
Q1 (0–30 mins)	60 (81.1%)	7 (9.5%)	7 (9.5%)	**<0.001**
Q2 (31–60 mins)	33 (39.3%)	36 (42.9%)	15 (17.9%)	
Q3 (61–120 mins)	3 (4.4%)	18 (26.5%)	47 (69.1%)	
Q4 (121+ mins)	13 (24.5%)	18 (34.0%)	22 (41.5%)	
Visit per week				
1–2 days a week	87 (73.1%)	19 (16.0%)	13 (10.9%)	**<0.001**
3–6 days a week	9 (13.2%)	38 (55.9%)	21 (30.9%)	
Every day in a week	13 (14.1%)	22 (23.9%)	57 (62.0%)	
Using before sleep				
Often	02 (2.6%)	21 (27.3%)	54 (70.1%)	<0.001
Sometimes	10 (17.5%)	27 (47.4%)	20 (35.1%)	
Rarely	97 (66.9%)	31 (21.4%)	17 (11.7%)	

We sought to identify the most popular social media platforms among our participants. In our sample of 279 college students, 71% reported using Facebook, 55% used Instagram, 45% used Twitter, and 20% engaged with other platforms such as Vine, Pinterest, and YouTube. These patterns mirror broader national trends: by January 2025, approximately 60 million Bangladeshis—roughly one-third of the population—were active social media users, with Facebook clearly leading the way, followed by Instagram and emerging platforms like YouTube.

Most Used Social Media Platform (n=279) *
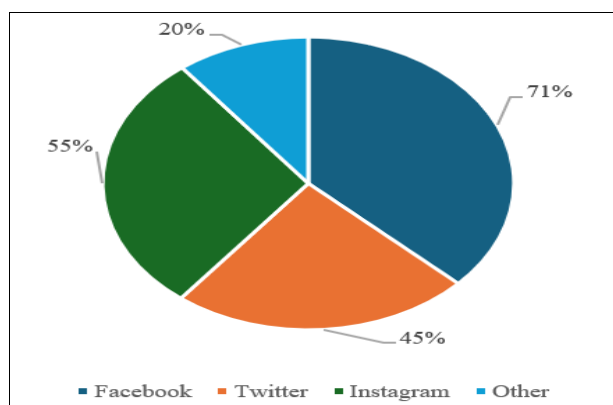
Fig 1: Most used social media platforms by the study participants (* = multiple response)
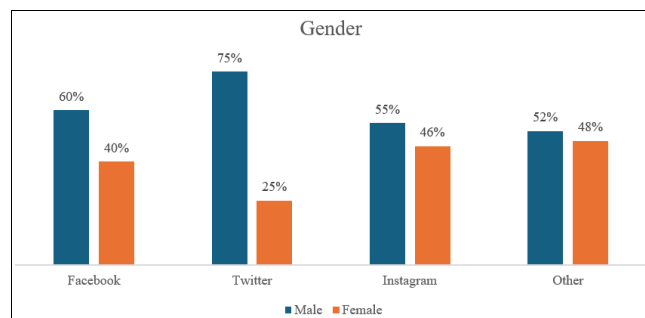
Fig 2: Use of social media according to Gender (* = multiple response)

In our sample, Twitter exhibited a pronounced gender disparity: 75% of users were male—a notably higher proportion than the global average of 63.7% male and 36.3% female users on X/Twitter Facebook also showed a male bias at 60% male versus 40% female, slightly exceeding the worldwide trend of approximately 56.8% male and 43.2% female. Instagram, with a 55% male to 45% female ratio, closely mirrors global demographics (around 49.2–50.7% male, 49.3–50.8% female). The "Other" category—encompassing platforms like YouTube, Pinterest, and Vine—showed near gender parity (52% male, 48% female), indicating a more balanced user base overall. In summary, our findings highlight a strong male skew on Twitter, a moderate lean on Facebook, and relatively equal gender representation on Instagram and other platforms.

Table 2: Logistic regression among participants characteristics and sleep quality

Variable	Category	OR	95% CI	p-value
Age	18–20 years	1.99	0.692–5.733	0.202
	21–23 years	1.17	0.370–3.727	0.786
	24 years and above	Ref	Ref	Ref
Gender	Male	0.79	0.272–1.584	0.602
	Female	Ref	Ref	Ref
Permanent Residence	Village Area	2.53	0.989–6.469	0.053
	City Area	Ref	Ref	Ref
Type of Family	Nuclear Family	1.85	0.606–5.687	0.279
	Joint Family	Ref	Ref	Ref
Educational status of Father	≤12 years	1.60	0.701–3.654	0.264
	>12 years	Ref	Ref	Ref
Educational status of Mother	≤12 years	0.61	0.260–1.428	0.254
	>12 years	Ref	Ref	Ref
Monthly Family Income	40,000–60,000 BDT	1.85	0.682–5.056	0.226
	>60,000 BDT	4.48	1.359–14.763	0.014 *
	<40,000 BDT	Ref	Ref	Ref
Relationship status	In a relationship	1.67	0.737–3.817	0.217
	Single	Ref	Ref	Ref
Smoking Habit	No	0.589	0.240–1.447	0.248
	Yes	Ref	Ref	Ref

We did not observe any significant relationship between participants' baseline demographic characteristics and their sleep disturbance levels. However, we found a strong association between social media usage patterns and sleep disruption. Logistic regression analysis revealed that participants who used social media for 31–60 minutes per day had eight times higher odds of experiencing sleep disturbances compared to those with up to 30 minutes of daily use. Additionally, individuals who accessed social media 3–6 days per week had approximately 5.6 times greater odds (OR = 5.616, 95% CI: 2.01–15.71), while those using it daily had about 10.7 times greater odds (OR = 10.702, 95% CI: 2.84–40.37), compared to participants who used social media only 1–2 days per week.

Table 3: Associations between social media use and sleep disturbance using logistic regression

Variable	Category	OR	95% CI	p-value
Minutes per day	31-60 mins	8.077	1.334-10.181	0.012
	61-120 mins	7.623	1.724-33.709	0.007
	120+	11.382	3.000-43.186	0.001
	0-30 mins	Ref	Ref	Ref
Visit frequency per week	3-6 days a week	5.616	2.008-15.707	0.001
	Every day in a week	10.702	2.837-40.367	<0.001
	1-2 days in a week	Ref	Ref	Ref
Social media use before sleep	Often	12.935	3.866-43.277	<0.001
	Sometimes	10.609	3.780-29.776	<0.001
	Rarely	Ref	Ref	Ref

Among the study participants who use social media before sleep often and sometimes are at 12 and 10 times more risk of getting sleep disturbance than those who do it rarely (OR: 12.935 (3.866-43.277); OR: 10.609 (3.780-29.776) respectively.

Finding
In our sample of Bangladeshi young adults (18–25 years), the median social media (SM) use was 45 minutes per day, and more than half reported moderate-to-high sleep disturbances—findings consistent with prior research. Crucially, we found that both SM volume and frequency were significantly associated with sleep issues, but the frequency of SM engagement—how often users checked or updated platforms—was a stronger predictor (adjusted odds ratio ≈ 3) than the total time spent (AOR ≈ 2). This suggests that repetitive "checking" behavior may pose a greater risk to sleep health than cumulative use.

Our cross-sectional design limits causal interpretation: SM use may impair sleep, poor sleep may drive SM use, or both may reinforce each other. Nonetheless, several plausible mechanisms could explain how SM disrupts sleep. First, SM often displaces sleep by pushing bedtimes later. Second, SM use—especially near bedtime—can cause cognitive and emotional arousal, due to interactions, engaging content, or FOMO (fear of missing out). Third, the blue light emitted from screens can suppress melatonin production and shift circadian rhythms.

On the other hand, individuals with sleep difficulties may turn to SM at night, using it as a coping mechanism for insomnia or nocturnal wakefulness. This could establish a feedback loop—poor sleep fueling SM use, which in turn exacerbates sleep problems. Notably, SM platforms, unlike passive media (e.g., TV), promote interactive engagement that can intensify arousal and impact sleep.

From a clinical perspective, these findings underscore the importance of screening for habitual SM behaviors—especially frequent checking—in young adults presenting with sleep issues. Behavioral interventions could focus on reducing bedtime use, given evidence that limiting screen exposure before sleep supports better rest. Educational programs and public-health campaigns might promote "screen-free" time before bed and highlight blue-light impacts to safeguard circadian health.

Future research should prioritize longitudinal designs to clarify the directionality of associations and fine-grained assessments that distinguish between passive browsing and active engagement. Additionally, exploring the emotional context of use—such as negative social comparison or stress—may reveal further pathways impacting sleep. Such insights will be crucial for crafting targeted interventions that support healthier SM habits and strengthen sleep hygiene during emerging adulthood.

Conclusion and Recommendation
Our study—focusing on Bangladeshi emerging adults aged 18–25—found a median daily social media (SM) use of 45 minutes, with over half of participants reporting moderate-to-severe sleep disturbances. Notably, both SM volume (minutes per day) and frequency (visits per week) were strongly and progressively linked to poorer sleep. Intriguingly, SM frequency showed a stronger association (AOR ≈ 3) than SM volume (AOR ≈ 2), suggesting that repeated checking may be a more potent marker of risk than total time spent.

Since our design is cross-sectional, we cannot clarify the direction of these associations. However, several plausible mechanisms explain how SM might impair sleep: bedtime SM use can delay sleep onset; emotionally or cognitively stimulating content may elevate arousal; and blue-light exposure can shift circadian rhythms. Conversely, individuals with sleep problems may turn to SM to pass time or distract themselves, creating a cyclical pattern of worsening sleep and increased use. Interactive SM may exacerbate this cycle more than passive media use.

Clinically, these results support screening for frequent or bedtime SM use in young adults presenting with sleep issues. Intervention strategies—such as encouraging screen-free time before bed, and educating on blue-light effects—could be beneficial. For broader impact, public health initiatives and SM platforms themselves might promote healthier usage habits, especially around bedtime.

To better understand causality and contextual mechanisms, longitudinal studies are essential. Future work should also differentiate types of SM engagement (e.g., passive browsing vs. active interaction) and emotional tone, as these dimensions are likely to affect sleep differently. Integrating measures of negative social comparison and pre-sleep cognitive arousal could further elucidate pathways linking SM behavior to sleep quality—insights that may guide targeted interventions in emerging adults.

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