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ORIGINAL RESEARCH ARTICLE

Social Media Addiction Dimensions, Sleep Disturbances, and Cumulative GPA Among Undergraduate Students: A Cross-sectional Study

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Abstract

To examine the relationships among social media addiction, sleep quality, and academic performance in university students. This cross-sectional study included 199 university students. Data were collected using a sociodemographic questionnaire, the Social Media Addiction Scale (SMAS), the Pittsburgh Sleep Quality Index (PSQI), and cumulative grade point average (GPA) verified from official academic transcripts. Pearson correlation and multiple linear regression analyses were performed. Most participants (61.8%) used social media for 3–5 hours daily. Total social media addiction was not associated with global sleep quality or cumulative GPA ($p > .05$). Sleep disturbance was negatively correlated with cumulative GPA (r = −.20, $p = .004$) and remained independently associated with cumulative GPA in the multivariable analysis (β = −.166, $p = .015$). Interference with daily life/loss of control was also negatively associated with cumulative GPA (β = −.295, $p = .005$), whereas deprivation showed a positive adjusted association (β = .247, $p = .019$). Female students had significantly higher GPAs than male students ($p < .001$). Sleep disturbance and impaired behavioral control, rather than overall social media addiction, were associated with lower cumulative GPA.

Keywords Social media addiction · Sleep disturbances · Cumulative GPA · Undergraduate studentents · Problematic social media use

Introduction

Rapid technological advancements and widespread internet adoption have profoundly changed lifestyles across all segments of society. The internet has shifted communication into the digital realm, fundamentally transforming media consumption. Social media platforms are now central to daily life, especially for young adults and college students, occupying a significant portion of their time (Doğan & Gündüz, 2025).

Excessive social media use is drawing increasing attention in clinical, scientific, and social fields. Over time, this can lead to a loss of control and an inability to stop using social media. These signs may indicate problematic use and a tendency toward addiction. Researchers suggest that individuals who turn to social media as their main strategy for coping with stress, loneliness, or depression risk shifting from normal to problematic use (Mascia et al., 2020). In the present study, social media use refers to the frequency or duration of engagement with social media platforms, whereas social media addiction refers specifically to the addictive-use characteristics assessed by the SMAS, including deprivation and interference with daily life/loss of control. These constructs should therefore not be considered interchangeable. Likewise, smartphone use and overall screen time represent broader forms of digital-media exposure and should not be interpreted as equivalent to social media use, problematic social media use, or social media addiction. Importantly, general social media use and problematic social media use represent conceptually distinct patterns of engagement. Recent meta-analytic evidence has

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evaluated these constructs separately and found that problematic social media use is associated with sleep problems (Ahmed et al., 2024).

Although prolonged social media use is often mistaken for social media addiction—or considered to have equivalent effects—the essential difference is that addiction includes a psychological component and results in a loss of self-control. While extended use may produce problems that respond to relatively simple interventions, addiction necessitates a more comprehensive strategy (Chen et al., 2022).

As social media use—particularly among college students—has evolved into an addiction, sleep disorders and a decline in academic performance are drawing increasing attention. While the prevalence of insomnia worldwide is 7.4% in the general population, this rate has been found to be 18.5% among college students (Zheng & Ling, 2021). Although the underlying mechanisms linking social media use and sleep problems remain unclear, various possible mechanisms have been proposed. Accordingly, social media use may directly affect sleep quality by consuming excessive time or indirectly influence psychological arousal through exposure to stimulating content, which in turn can interfere with sleep. It has been reported that delayed sleep onset and poor sleep quality are positively associated with increased time spent online. Among individuals with social media addiction, it has been reported that not only do they experience sleep disturbances, but their academic performance is also affected (Kolhar et al., 2021).

Sleep disorders can negatively affect individuals' attention and academic performance by impacting not only physiological processes but also cognitive processes. Consequently, it is believed that social media addiction can reduce academic performance both by causing stress and by disrupting sleep patterns (Anierobi et al., 2021).

In particular, when students spend too much time on these platforms—whether during or outside class—it can limit the time they have available to study and focus on their work. The mental energy spent on these platforms during lectures or study sessions first leads to increased stress and, subsequently, to lower academic performance (Ning & İnan, 2024). Malik et al. (2021) reported that students stayed up late due to internet use, which contributed to fatigue and, in some cases, missing classes because of difficulty waking up in the morning. Students' academic performance is measured through ongoing assessments and the grade point average (GPA) they achieve on exams. Social media fatigue, which can cause users to distance themselves from social media platforms, can also lead to a decline in students' academic performance (Malik et al., 2021). Prolonged social media use has been found to be associated with delayed sleep onset, poor sleep quality, and lower academic achievement; mechanisms such as social media fatigue and distractibility can limit students' study time and ability to concentrate (Zhuang et al., 2023). Based on previous findings, problematic social media use may be related to sleep and academic performance through factors such as delayed sleep, reduced study time, and difficulties in concentration. However, in the present cross-sectional study, these variables were examined in terms of their associations, and no causal or mediating relationship was tested.

Previous studies have reported associations between problematic social media use, sleep, and academic performance. However, many studies have focused on total social media use or overall addiction scores, although different dimensions of problematic use may not relate to academic performance in the same way. A similar issue applies to sleep, as individual components of sleep quality may show different associations with academic outcomes that are not apparent from the global PSQI score alone. In addition, academic performance is often based on self-reported GPA, which may introduce reporting error. Examining specific dimensions of social media addiction and individual sleep characteristics together with verified cumulative GPA may therefore provide a more detailed understanding of these relationships. In the present study, we examined the relationships between social media addiction and its dimensions, sleep quality and its components, and cumulative GPA obtained from academic records. We also examined which of these factors were independently associated with GPA. BMI was assessed as a secondary anthropometric variable in relation to sleep quality and social media addiction.

Materials and Methods

Study Design

This analytical cross-sectional study was conducted during the fall semester of the 2025–2026 academic year, between October 15 and December 15, 2025 among undergraduate students enrolled at a private university in Istanbul, Türkiye. Students from the Faculty of Law, Faculty of Arts and Sciences, and Faculty of Engineering were recruited face-to-face on the university campuses where they were studying, during class breaks and in their classrooms. The study aimed to: (1) compare GPA, social media addiction scores, and BMI according to sleep quality and gender; (2)

examine the relationships among social media addiction and its dimensions, sleep quality and its components, and cumulative GPA; and (3) examine factors independently associated with cumulative GPA using multiple linear regression analysis.

Participants and Sample Size

The study population consisted of undergraduate students enrolled at a private university during the 2025–2026 academic year. Eligible participants were undergraduate students who were actively enrolled during the study period, actively used at least one social media platform, voluntarily agreed to participate, and completed all study questionnaires.

Participants were excluded if they had a diagnosed psychiatric disorder (e.g., depression or anxiety disorders), a diagnosed sleep disorder, any chronic disease that could affect sleep quality or cognitive performance, were using medications such as antidepressants or sedatives, worked night or rotating shifts, completed the questionnaires incompletely, or did not report their cumulative GPA. These exclusion criteria were assessed based on participants' self-reports; medical records were not accessed or reviewed.

The required sample size was calculated using G*Power version 3.1 based on multiple linear regression analysis. Assuming a medium effect size ($f^2 = 0.15$), a significance level of $\alpha = 0.05$, a statistical power of 80%, and three predictor variables, the minimum required sample size was calculated as 77 participants. Participants were recruited using convenience sampling from students who were accessible during the study period and met the eligibility criteria. A total of 220 students initially agreed to participate. Of these, 21 were not included in the final analyses: 12 did not provide their cumulative GPA from the university system, six declined anthropometric measurements, and three withdrew during questionnaire administration. Thus, 199 students were included in the final analyses, exceeding the minimum required sample size. The participant selection process is presented in Fig. 1.

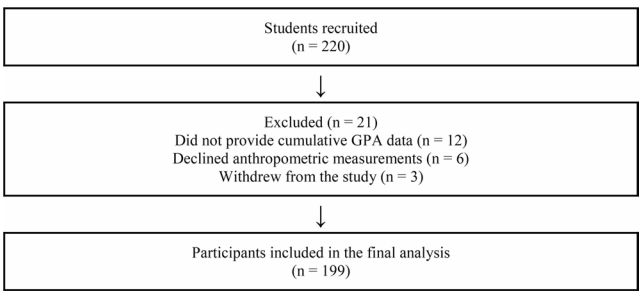


Fig. 1 Participant flow diagram. Note. GPA, grade point average

Data Collection Procedure

Data were collected through face-to-face, researcher-administered interviews conducted by the two authors who designed the study. As both researchers were familiar with the study protocol and data collection procedures, no separate interviewer training was provided. Before data collection, the researchers explained the purpose and procedures of the study, and students who agreed to participate provided written informed consent. Questionnaires were completed individually during the interview, and participants' responses were not shared with other students. For verification of cumulative GPA, participants logged into the university student information system on their own mobile phones and showed their cumulative GPA to the researcher, who recorded the value on the study form. Researchers did not directly access participants' student information system accounts. Completion of the questionnaire required approximately 10–15 min. No financial compensation, gifts, incentives, or other forms of compensation were provided to participants for their participation in the study.

Data Collection Instruments

The data collection form used in the study was developed by the researchers and consists of four sections. In the first section of the form, participants were asked to provide their age, gender, year of study (second year, third year, or fourth year or above), and daily social media usage time. Gender was self-reported using the response options "female," "male," and "other," with a free-text field for the latter. No participant selected the "other" option; therefore, only female and male categories were represented in the sample and included in the analyses. In the second section, the Social Media Addiction Scale (SMAS) was administered; in the third section, the Pittsburgh Sleep Quality Index (PSQI); and in the fourth section, the Academic Achievement Measure: participants' cumulative GPA, obtained from official academic transcripts presented during data collection.

Body weight was measured using a portable OMRON BF-511 body composition monitor. Height was measured in centimeters using a measuring tape while participants were barefoot and standing upright. Body mass index (BMI) was calculated as body weight in kilograms divided by height in meters squared (kg/m^2). BMI was classified according to World Health Organization (WHO) criteria as underweight (<18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25.0–29.9 kg/m^2), and obesity (≥ 30.0 kg/m^2) (World Health Organization [WHO], 2000).

SMAS

This scale was used to assess participants' social media usage habits and levels of addiction. The SMAS consists of two factors and a total of 24 items. The SMAS was selected because its two-dimensional structure enables the assessment of specific aspects of problematic social media use, particularly deprivation and interference with daily life/loss of control, in addition to the total score. This structure was considered particularly suitable for the present study, which aimed to examine whether specific dimensions of social media addiction were differentially associated with sleep quality and academic performance. The "Deprivation" subscale has 14 items (1, 2, 3, 4, 5, 6, 8, 10, 13, 14, 16, 20, 21, 24); and the "Interference with Daily Life/Loss of Control" subscale consists of 10 items (7, 9, 11, 12, 15, 17, 18, 19, 22, 23). The scale uses a five-point rating scale (Never = 1, Rarely = 2, Sometimes = 3, Often = 4, and Always = 5), and individuals respond by selecting the rating that best applies to them for each item. Additionally, there are no reverse-coded items on the scale. The total possible score on the SMAS ranges from 24 to 120; the total possible score for the deprivation dimension ranges from 14 to 70, while the total possible score for the Interference with Daily Life/Loss of Control dimension ranges from 10 to 50. Higher SMAS scores indicate higher levels of social media addiction (Fırat & Barut, 2018). Although the SMAS was originally developed and validated in an adolescent sample, the same 24-item instrument has subsequently been used in university student populations (Akben, 2026). In the present study, internal consistency was high for the Deprivation subscale (Cronbach's $\alpha = 0.91$), the Interference with Daily Life/Loss of Control subscale (Cronbach's $\alpha = 0.88$), and the total SMAS (Cronbach's $\alpha = 0.94$). In the present study, the term 'social media addiction' refers to the construct assessed by the SMAS and should not be interpreted as a clinical diagnosis of behavioral addiction.

PSQI

Participants' sleep quality was assessed in a multidimensional manner. The scale consists of seven subscales: subjective sleep quality, time to fall asleep, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction (daytime sleepiness). Each component is scored on a scale of 0 to 3, with higher scores indicating poorer sleep quality. The overall score, calculated by summing the subcomponent scores, ranges from 0 to 21 and reflects the individual's overall sleep quality. Higher PSQI scores indicate poorer sleep quality. A global PSQI score > 5 was used to indicate poor sleep quality, consistent with the established PSQI cut-off; however, the PSQI is a screening measure and does not provide a clinical diagnosis of a sleep disorder. The cut-off score of > 5 for poor sleep quality was based on the original PSQI validation study, which demonstrated a sensitivity of 89.6% and a specificity of 86.5% in distinguishing poor sleepers from good sleepers (Buysse et al., 1989). In the analyses, the PSQI total score was treated as a continuous variable, whereas the predefined PSQI categories were used as a categorical variable for group comparisons. Accordingly, the scale allows both detailed analysis at the subscale level and an overall assessment of sleep quality based on the total score (Ağargün et al., 1996). In the present study, the PSQI demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.77$).

Academic Performance

Academic performance was assessed using participants' cumulative GPA based on the university's 4-point grading system. During questionnaire administration, participants were asked to present their official academic transcripts (or student information system records), and cumulative GPA values were recorded directly by the researchers.

Statistical Analysis

The collected data were analyzed using IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY, USA). Statistical significance was set at $p < .05$, and all statistical tests were two-tailed. Categorical variables, including gender, year of study, social media account ownership, time spent on social media, and the most frequently used social media application, were summarized as frequencies and percentages. Continuous variables, including age, body mass index (BMI), sleep duration, GPA, sleep quality scores, and social media addiction scores, were presented as mean ± standard deviation (SD) and minimum–maximum values (Field, 2018). The normality of continuous variables was assessed using the Shapiro–Wilk test, visual inspection of histograms, and examination of skewness and kurtosis values (Tabachnick & Fidell, 2013). Differences in GPA, BMI, and the total and subscale scores of social media addiction among sleep quality groups were evaluated using one-way analysis of variance (ANOVA). Comparisons of GPA, sleep quality scores, and the total and subscale scores of social media addiction between males and females were performed using the independent-samples t test or the Mann–Whitney *U* test, as appropriate (Schober et al., 2018). The relationships among GPA, sleep quality scores, and the total and subscale scores of social media addiction were examined using Pearson's correlation coefficient. The internal consistency of the

measurement instruments was evaluated using Cronbach's alpha coefficients. Multiple linear regression analysis was performed to examine factors independently associated with GPA. Based on theoretical relevance and the results of the correlation and group comparison analyses, gender, sleep disturbances, and the two subscales of the SMAS (deprivation and interference with daily life/loss of control) were entered simultaneously into the regression model using the enter method. Gender was coded as female = 1 and male = 2. Regression assumptions, including linearity, normality of residuals, homoscedasticity, and multicollinearity, were evaluated before analysis. Multicollinearity was assessed using tolerance and variance inflation factor (VIF) values. Tolerance values > 0.10 and VIF values < 5 were considered indicative of the absence of multicollinearity. Regression results were reported as unstandardized regression coefficients (B), standardized regression coefficients (β), 95% confidence intervals (CI), coefficient of determination (R^2), and F statistics (Hair et al., 2019).

Ethical Considerations

Ethical approval for the study was obtained from the Istanbul Kültür University Scientific Research and Publication Ethics Committee on October 14, 2025 (Meeting No. 07, Decision No. 18). All participants were informed about the purpose and procedures of the study and provided written informed consent before participation.

Results

The descriptive characteristics of the study participants are presented in Table 1. Among the 199 participants, 112 (56.3%) were women and 87 (43.7%) were men. Seventy-one participants (35.6%) were in their fourth year or above. The most frequently used social media platform was Instagram (n = 79, 39.7%), and 123 participants (61.8%) reported using social media for 3–5 h per day. The mean age, BMI, and sleep duration were 21.5 ± 1.8 years, 24.23 ± 3.04 kg/m², and 7.85 ± 1.06 h, respectively. The corresponding ranges were 18–25 years for age, 16.60–33.08 kg/m² for BMI, and 5–11 h for sleep duration.

Table 2 presents the comparison of academic performance, social media addiction scores, and BMI according to sleep quality status. No significant differences were observed among the sleep quality groups in cumulative GPA (F = 2.11, p = .124), deprivation (F = 0.97, p = .381), interference with daily life/loss of control (F = 0.88, p = .417), social media addiction (F = 0.82, p = .440), or BMI (F = 1.71, p = .184).

Table 1 Descriptive characteristics of the study participants

Variable	Group	*n*	%	Mean ± SD (Min–Max)
Age (years)	—	—	—	21.5 ± 1.8 (18–25)
BMI (kg/m²)	—	—	—	24.23 ± 3.04 (16.60–33.08)
Gender	Female	112	56.3	—
	Male	87	43.7	—
Year of study	Second year	62	31.2	—
	Third year	66	33.2	—
	Fourth year or above	71	35.6	—
Daily social media use	0–1 h	2	1.1	—
	1–3 h	52	26.1	—
	3–5 h	123	61.8	—
	≥ 5 h	22	11.0	—
Most frequently used social media platform	Instagram	79	39.7	—
	TikTok	47	23.6	—
	Youtube	42	21.1	—
	X (formerly Twitter)	31	15.6	—

Categorical variables are presented as n (%), and continuous variables as mean ± SD (min–max). *BMI* body mass index, *SD* standard deviation

Comparisons of GPA, sleep quality, and social media addiction scores by gender are presented in Table 3. Female students had significantly higher GPA scores than male students (2.66 ± 0.41 vs. 2.42 ± 0.42; t = 4.02, p < .001). No significant gender differences were observed in PSQI components or social media addiction scores (all p > .05).

Table 4 presents the focused correlations among cumulative GPA, global PSQI score, sleep disturbances, deprivation, and interference with daily life/loss of control. Cumulative GPA was negatively correlated with sleep disturbances (r = −.20, p = .004), whereas its correlations with global PSQI score, deprivation, and interference with daily life/loss of control were not statistically significant. The full correlation matrix is provided in Supplementary Table S1.

The results of the multiple linear regression analysis examining factors associated with GPA are presented in Table 5. The regression model was statistically significant, F(4, 194) = 7.85, p < .001, and explained 13.9% of the variance in GPA (R^2 = 0.139; adjusted R^2 = 0.122). Gender was independently associated with GPA, with male students having lower GPA scores than female students after adjustment for the other variables (β = −0.254, p < .001). Sleep disturbances (β = −0.166, p = .015) and interference with daily life/loss of control (β = −0.295, p = .005) were significantly negatively associated with GPA, whereas deprivation was significantly positively associated with GPA (β = 0.247, p = .019). Although deprivation was not significantly correlated

Table 2 Comparison of grade point average, social media scores, and BMI according to sleep quality

Variable	Group	*n*	Mean ± SD	Min.	Max.	F (2,196)	*p*	η^2
Grade point average	Healthy Sleep	102	2.60 ± 0.43	1.60	3.60	1.44	0.240	0.014
	Poor Sleep	74	2.50 ± 0.41	1.69	3.33			
	Long-Term Sleep Disturbance	23	2.52 ± 0.46	1.54	3.42			
Deprivation	Healthy Sleep	102	47.27 ± 10.29	14.00	70.00	1.13	0.324	0.011
	Poor Sleep	74	49.27 ± 9.36	27.00	66.00			
	Long-Term Sleep Disturbance	23	49.78 ± 10.78	28.00	67.00			
Interference with daily life / Loss of control	Healthy Sleep	102	31.15 ± 8.96	10.00	50.00	0.53	0.588	0.005
	Poor Sleep	74	31.72 ± 9.30	12.00	47.00			
	Long-Term Sleep Disturbance	23	33.30 ± 9.24	14.00	46.00			
Social media addiction	Healthy Sleep	102	78.42 ± 18.19	24.00	120.00	0.84	0.434	0.008
	Poor Sleep	74	80.99 ± 17.44	45.00	113.00			
	Long-Term Sleep Disturbance	23	83.09 ± 18.93	42.00	113.00			
BMI	Healthy Sleep	102	24.08 ± 3.03	16.60	33.08	0.47	0.626	0.005
	Poor Sleep	74	24.49 ± 3.21	18.12	31.25			
	Long-Term Sleep Disturbance	23	23.98 ± 2.56	19.14	29.06			

Sleep-quality groups were defined using the corrected PSQI global score as follows: Healthy Sleep, 0–5; Poor Sleep, 6–10; and Long-Term Sleep Disturbance, > 10. Values are presented as n, mean ± SD, and range. One-way ANOVA was used for group comparisons. Post-hoc tests were not performed because none of the omnibus ANOVA tests were statistically significant. *BMI* body mass index, *PSQI* Pittsburgh sleep quality index, *SD* standard deviation, η^2 eta squared

Table 3 Comparison of grade point average, sleep quality, and social media addiction scores by gender

Variable	Group	Mean ± SD	Min.	Max.	Test statistic	*p*
Grade point average	Female	2.66 ± 0.41	1.68	3.44	4.02^{t}	< 0.001
	Male	2.42 ± 0.42	1.54	3.60		
	Total	2.55 ± 0.43	1.54	3.60		
Subjective sleep quality	Female	1.18 ± 1.08	0.00	3.00	-1.40^{u}	0.161
	Male	1.37 ± 1.02	0.00	3.00		
	Total	1.26 ± 1.06	0.00	3.00		
Sleep latency	Female	1.17 ± 0.75	0.00	3.00	-0.95^{u}	0.342
	Male	1.28 ± 0.82	0.00	3.00		
	Total	1.22 ± 0.78	0.00	3.00		
Sleep duration	Female	0.20 ± 0.53	0.00	3.00	-0.62^{u}	0.553
	Male	0.18 ± 0.39	0.00	1.00		
	Total	0.19 ± 0.48	0.00	3.00		
Habitual sleep efficiency	Female	0.11 ± 0.47	0.00	3.00	-0.19^{u}	0.847
	Male	0.06 ± 0.23	0.00	1.00		
	Total	0.09 ± 0.39	0.00	3.00		
Sleep disturbances	Female	1.33 ± 0.54	0.00	2.00	-1.70^{u}	0.090
	Male	1.48 ± 0.55	1.00	3.00		
	Total	1.40 ± 0.55	0.00	3.00		
Use of sleep medication	Female	0.39 ± 0.59	0.00	2.00	-1.03^{u}	0.310
	Male	0.47 ± 0.61	0.00	2.00		
	Total	0.43 ± 0.60	0.00	2.00		
Daytime dysfunction	Female	1.19 ± 0.86	0.00	3.00	-0.39^{u}	0.701
	Male	1.24 ± 0.88	0.00	3.00		
	Total	1.21 ± 0.86	0.00	3.00		
Global sleep quality score	Female	5.56 ± 3.37	0.00	14.00	-1.24^{u}	0.216
	Male	6.08 ± 3.26	1.00	13.00		
	Total	5.79 ± 3.33	0.00	14.00		
Deprivation	Female	47.67 ± 9.47	26.00	70.00	-1.02^{t}	0.310
	Male	49.13 ± 10.68	14.00	67.00		
	Total	48.31 ± 10.02	14.00	70.00		
Interference with daily life/Loss of control	Female	31.17 ± 8.97	12.00	50.00	-0.77^{t}	0.442
	Male	32.17 ± 9.29	10.00	47.00		
	Total	31.61 ± 9.10	10.00	50.00		
Social media addiction	Female	78.84 ± 17.21	41.00	120.00	-0.94^{t}	0.340
	Male	81.30 ± 18.95	24.00	113.00		
	Total	79.91 ± 17.99	24.00	120.00		

t = independent-samples *t* test; *U* = Mann–Whitney *U* test

Table 4 Correlations among the variables

Variable		1	2	3	4	5
Grade point average	*r*	—				
	p	—				
Global PSQI score	*r*	−0.10	—			
	p	0.147	—			
Sleep disturbances	*r*	−0.20	0.69	—		
	p	0.004	<0.001	—		
Deprivation	*r*	−0.01	0.10	0.07	—	
	p	0.877	0.155	0.298	—	
Interference with daily life/Loss of control	*r*	−0.13	0.09	0.07	0.77	—
	p	0.068	0.214	0.357	<0.001	—

r, Pearson's correlation coefficient; *p*, significance level

Table 5 Multiple linear regression analysis of predictors of grade point average

Model	B	SE	β	t	*p*	95% confidence interval	
						Lower	Upper
Constant	2.975	0.166		17.889	<0.001	2.647	3.303
Gender (male vs. female)	-0.218	0.058	−0.254	-3.774	<0.001	-0.331	-0.104
Sleep disturbances	-0.129	0.052	-0.166	-2.466	0.015	-0.232	-0.026
Deprivation	0.010	0.004	0.247	2.359	0.019	0.002	0.019
Interference with daily life/ Loss of control	-0.014	0.005	-0.295	-2.824	0.005	-0.023	-0.004

B unstandardized regression coefficient, β standardized regression coefficient, *SE* standard error, *CI* confidence interval, R multiple correlation coefficient. Gender was coded as female = 1 and male = 2

Model statistics: $F(4, 194) = 7.85$, $p < .001$; $R = .373$; $R^2 = 0.139$; adjusted $R^2 = 0.122$

with GPA in the bivariate analysis, it showed a significant positive association with GPA after adjustment for gender and the other variables in the multivariable model. Given this difference between the bivariate and multivariable findings, the result should be interpreted cautiously.

Discussion

This study examined the relationships among social media addiction and its dimensions, sleep quality, and cumulative GPA among university students. Although a considerable proportion of students spent substantial time on social media, no direct relationship was found between the total social media addiction score and either sleep quality or cumulative GPA. In contrast, sleep disturbances and interference with daily life/loss of control were negatively associated with academic performance in the regression analysis. Female students also had significantly higher GPAs than male students, and gender remained independently associated with GPA in the multivariable regression analysis. These findings suggest that specific behavioral dimensions of social media addiction and sleep may be more relevant to cumulative GPA than the overall level of social media addiction. In the present study, sleep quality was conceptualized as a correlate of social media addiction and as a factor potentially associated with cumulative GPA, rather than as a mediator or causal mechanism linking social media addiction to academic performance. Accordingly, the analyses examined direct associations among social media addiction dimensions, sleep characteristics, and cumulative GPA without testing a mediation pathway.

Approximately three-quarters of the participants spent at least three hours per day on social media. College students use these platforms not only for entertainment but also for communication, academic activities, study groups, and maintaining social relationships. Therefore, duration of use alone may not adequately reflect problematic social media use or addiction. A recent review reported that academic and psychological outcomes are more strongly associated with characteristics of problematic use, such as impaired functioning and loss of control, than with duration of use alone (Fatima et al., 2025). Nevertheless, other studies have shown that using social media for more than three hours per day is associated with an increased likelihood of addiction (Gopakumar et al., 2025). Instagram was the most frequently used platform in the present study, followed by TikTok and YouTube, reflecting current usage trends among university students. Previous evidence also suggests that the timing of social media use, particularly during the evening and before bedtime, may have a greater impact on sleep than total daily usage time. A systematic review reported that digital media use in late adolescence is associated with shorter sleep duration and poorer sleep quality, particularly

when used during nighttime hours (Brautsch et al., 2023). The absence of information regarding the timing of social media use should therefore be considered when interpreting the lack of a significant association between total social media addiction and sleep quality in the present study.

No significant differences in GPA were found among the three PSQI score groups. Likewise, the global PSQI score was not significantly associated with cumulative GPA. These findings differ from many previous studies reporting that insufficient or poor-quality sleep negatively affects academic performance. A systematic review including 30 studies concluded that sleep quality, sleep duration, daytime sleepiness, sleep regularity, and sleep disorders are all associated with academic performance (Suardiaz-Muro et al., 2020). Similarly, a systematic review and meta-analysis conducted among medical students demonstrated that sleep disorders adversely affect learning capacity and academic achievement (Seoane et al., 2020). Several factors should be considered when interpreting the lack of an association between global sleep quality and cumulative GPA. First, cumulative GPA reflects academic performance across several semesters, whereas sleep was assessed at a single time point. In addition, academic performance may be associated with factors not assessed in this study, including study habits, motivation, attendance, and course-related characteristics. Second, the global PSQI score may not capture associations involving specific sleep components. In the present study, sleep disturbances, but not the global PSQI score, were associated with cumulative GPA. Sleep disturbance was negatively associated with GPA and remained independently associated with GPA in the regression analysis. Sleep plays an essential role in memory consolidation, attention, executive functioning, and cognitive performance (Brautsch et al., 2023). Previous studies have also linked sleep disturbances with reduced daytime alertness, concentration, and academic performance (Suardiaz-Muro et al., 2020). These findings suggest that disturbances in sleep continuity, rather than overall sleep quality, may be particularly relevant to academic achievement.

However, the positive association between the deprivation subscale of the SMAS and GPA in the regression analysis differs from expectations based on previous literature. This finding should not be interpreted as indicating that higher deprivation improves academic performance. Notably, deprivation was not significantly associated with GPA in the bivariate analysis but showed a positive association after adjustment for gender and the other variables in the multivariable model. This change may reflect a multivariable adjustment effect; however, the mechanism cannot be established from the present cross-sectional data. Therefore, this finding should be interpreted cautiously. These findings highlight the importance of distinguishing time spent on social media from problematic patterns of use. Longer use does not necessarily indicate problematic use, whereas loss of control and interference with daily life may be more relevant to academic functioning. However, given the cross-sectional design of this study, our findings do not show that reducing social media use or improving sleep would necessarily lead to better GPA.

No significant association was observed between the total social media addiction score and overall sleep quality. Likewise, social media addiction scores did not differ across sleep quality groups. These findings differ from previous studies reporting that problematic social media use is associated with poorer sleep quality. Zhu et al. (2023) found that both social media addiction and social media fatigue were associated with poor sleep quality among university students (Zhu et al., 2023). Similarly, a study conducted in Bangladesh reported a higher prevalence of poor sleep quality among students with greater levels of social media addiction (Rahman et al., 2025). A recent meta-analysis also concluded that problematic electronic media use is more strongly associated with sleep problems than general media use (Han et al., 2024).

Differences between the present findings and previous studies may be related to variations in sample characteristics and patterns of social media use. In particular, the timing and context of social media use may be relevant to sleep outcomes. Bedtime social media use, device use in bed, nighttime notifications, and fear of missing out were not assessed in the present study. Previous systematic reviews have similarly suggested that associations between social media use and sleep may vary according to the timing, context, and psychological characteristics of use (Rahman et al., 2025; Han et al., 2024). Several mechanisms have been proposed to explain the association between social media use and sleep. Excessive use may delay bedtime, replace sleep time, increase emotional arousal through stimulating content, and expose users to nighttime notifications and screen light, all of which may interfere with normal sleep patterns. Fear of missing out may further encourage checking social media before sleep, delaying sleep onset. Woods and Scott reported that nighttime social media use and emotional investment in social media were associated with poorer sleep quality (Woods & Scott, 2016). These findings suggest that the context and timing of social media use may be more closely related to sleep than the total amount of use.

No significant relationship was found between the total social media addiction score and GPA. Although several previous studies have reported a negative association between social media use and academic performance, these relationships are generally weak to moderate (Ahmed et al., 2024). Thus, social media use alone may not be strongly associated with academic achievement.

The influence of social media on academic performance likely depends on how it is used. Academic communication, information sharing, and access to educational resources may support learning, whereas uncontrolled use, distraction, procrastination, and reduced study time may impair academic performance. The coexistence of these opposing effects within the same sample may explain the absence of a direct association between the total social media addiction score and GPA. Previous studies have proposed that factors such as sleep quality, fatigue, procrastination, fear of missing out, and self-regulation may contribute to the relationship between problematic social media use and academic performance (Woods & Scott, 2016). However, these potential pathways were not examined in the present study, and no conclusions regarding mediation or causal mechanisms can be drawn from our findings.

The regression analysis demonstrated that gender, sleep disturbances, deprivation, and interference with daily life/loss of control were independently associated with cumulative GPA. These findings suggest that the functional consequences of social media use, rather than its overall severity, may have greater implications for academic achievement.

The negative association between the impact on daily life/loss of control subscale and GPA is consistent with previous evidence indicating that difficulties in self-regulation and behavioral control interfere with academic functioning. Students who have difficulty controlling their social media use may spend less time studying, experience more distractions during academic activities, and show greater procrastination, all of which may contribute to lower academic achievement (Bhandarkar et al., 2021). These findings support the view that the behavioral consequences of problematic social media use are more relevant to academic performance than the frequency or duration of use alone.

Female students had significantly higher cumulative GPAs than male students, whereas no significant gender differences were observed in social media addiction or sleep quality. Gender differences in social media use and academic outcomes have also been reported in previous research, although the patterns of these differences have not been consistent across studies (Alnjadat et al., 2019). The higher GPA observed among female students in the present study may therefore reflect factors other than social media addiction or sleep quality, such as differences in learning strategies, academic motivation, or study behaviors. However, these factors were not assessed in the present study and require further investigation. The mean cumulative GPA in the present sample was 2.55 on a 4-point scale, indicating a relatively modest level of academic performance. Studies conducted among university students in Türkiye suggest that academic performance may be associated with multiple individual and behavioral factors. For example, problem-solving skills and individual characteristics have been associated with GPA (Aslan & Polat, 2024), while another study reported no significant direct effect of Instagram addiction on academic performance and highlighted the role of academic procrastination (Pekpazar et al., 2021). Accordingly, the relatively low mean GPA observed in our sample may reflect a combination of academic, behavioral, and individual characteristics rather than social media use alone. The absence of a significant association between total social media addiction and GPA in the present study further supports the multifactorial nature of academic performance.

No significant association was found between BMI and either social media addiction or sleep quality. Although previous studies have reported inconsistent findings regarding the relationship between digital media use, sleep, and body weight, the relatively homogeneous BMI distribution of the present sample may have limited the ability to detect such associations. Furthermore, dietary habits, physical activity, sedentary behavior, and metabolic characteristics were not evaluated and may have influenced these relationships. Future studies incorporating these variables may provide a more comprehensive understanding of the interactions among lifestyle behaviors, sleep, and academic outcomes.

Limitations

This study has some limitations. First, the cross-sectional design does not allow for determining the direction of causality between variables. Given the cross-sectional design, reverse causality and residual confounding by unmeasured factors cannot be excluded. Social media addiction may be associated with poorer sleep quality, while students with sleep problems may also use social media more frequently at night. Similarly, poor sleep may be associated with lower academic performance, while academic stress and low performance may also contribute to sleep problems. Second, although cumulative GPA values were recorded from official academic transcripts presented by the participants, other study variables were based on self-reported data and may therefore be subject to recall and social desirability bias. In addition, the face-to-face data collection method may have increased the potential for social desirability bias, particularly in responses to the social media addiction scale. Third, potential confounding variables, such as time spent on social media, purpose of use, screen exposure before bedtime, notification frequency, device type, caffeine consumption, physical activity, mental health, and academic stress, were not assessed. Fourth, the study used a convenience sample from a single private university and did not include first-year students. Therefore, the sample may not be representative of students attending public universities, students from different academic or socioeconomic backgrounds,

or university students in other regions of Türkiye or other countries, and the generalizability of the findings should be considered limited. The relatively low mean GPA of the sample (2.55 on a 4-point scale) may further limit the generalizability of the findings to university student populations with different academic performance profiles. Information on faculty/academic discipline, socioeconomic characteristics, and living arrangements was not collected; therefore, the possible contribution of these contextual factors to the observed differences in GPA could not be evaluated. Fifth, the exclusion of students with diagnosed psychiatric or sleep disorders, chronic diseases that could affect sleep or cognitive performance, relevant medication use, and night or rotating shift work may have resulted in the underrepresentation of students with more severe sleep problems. This may have restricted the variability in sleep quality and attenuated the observed associations between sleep-related variables and the other study outcomes. Furthermore, cumulative GPA reflects academic performance over a longer period, whereas sleep and social media behaviors were assessed at a single time point.

Conclusion

In conclusion, overall social media addiction and global sleep quality were not directly associated with academic performance. However, sleep disturbances and interference with daily life/loss of control were independently associated with cumulative GPA. The multivariable model explained 13.9% of the variance in cumulative GPA, indicating that a substantial proportion of the variability remained unexplained. These findings suggest that specific aspects of sleep and difficulties in controlling social media use may be more relevant to academic performance than overall social media addiction. University student support programs may consider addressing sleep education and digital self-regulation together rather than focusing solely on reducing overall social media use. Future longitudinal studies using objective measures of social media use and sleep and verified measures of academic performance are needed to better understand the direction and mechanisms of these relationships.

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Author Contribution SN conceived and designed the study, collected the data, performed the statistical analyses, interpreted the data, drafted the manuscript, and approved the final version of the manuscript. ROI contributed to the study design, critically revised the manuscript for important intellectual content, and approved the final version of the manuscript. Both authors read and approved the final manuscript.

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Data Availability The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics Approval The study was approved by the Istanbul Kültür University Scientific Research and Publication Ethics Committee on October 14, 2025 (Meeting No. 07, Decision No. 18) and conducted in accordance with the principles of the Declaration of Helsinki.

Consent to Participate Written informed consent was obtained from all participants prior to participation in the study.

Consent for Publication Not applicable.

Competing Interests The authors declare that they have no competing interests.

Clinical Trial Number Not applicable.

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