

Scrolling vs. Studying: The Impact of Social Media on High School Students' Study Habits in Erbil, 2024-2025

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Abstract

Background and Aim High school students are increasingly engaged with social media, which may influence their study habits, academic performance, and overall lifestyle. This study aimed to analyze the demographic patterns of social media use, its perceived impact on study habits, and the effectiveness of management strategies among high school students in Erbil.

Methods This cross-sectional study was conducted from 12th of July to 11th of November, 2024, in five public high schools in Erbil. Convenience sampling was used to collect data using a structured questionnaire. The questionnaire included demographic information and the social media and Study Habits Assessment Scale (SMSHAS), which measured distraction, lifestyle disruption, and academic outcomes. Statistical analysis was performed using SPSS version 29 (IBM Corp., Armonk, NY, USA). Descriptive analysis, chi-square tests, and one-way ANOVA were conducted to assess associations between social media use, demographic variables, academic indicators, and management strategies.

Results A total of 500 students participated in the study. Most students reported daily social media use of 1–2 hours (37.2%) or 2–4 hours (34.0%), while 7.4% exceeded six hours. The most preferred platforms were YouTube (26.3%) and TikTok (25.7%). Negative impacts were common, with 73.8% reporting laziness, 62.0% experiencing sleep or eating difficulties, and 78.8% perceiving wasted time. Academic performance was significantly associated with daily usage hours ($p < 0.001$), as students using social media more than six hours daily had the lowest GPA (2.51 ± 0.79) compared to those using 1–2 hours (3.42 ± 0.58).

Conclusion The study demonstrated that high school students in Erbil are highly exposed to social media, with significant negative impacts on study habits and academic performance, particularly among heavy users. Educational stakeholders and policymakers should promote awareness campaigns and encourage the use of effective management strategies to support students in balancing digital engagement with academic success.

Keywords Social Media · Study Habits · Academic Performance · Adolescents · Education

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Introduction

Social media overuse is an emerging global concern, the extent and academic consequences of which have frequently been underestimated and overlooked. Ineffective monitoring methods and the scarcity of reliable statistics have produced wide-ranging estimates of 400 to 600 million adolescents affected worldwide by excessive social media use (Degenhardt et al., 2019, Fareeq Saber et al., 2024). Although platforms such as Facebook, TikTok, and Instagram are used almost globally, it is students from low-resource settings, where educational support and guidance are inadequate, who are most affected. An international campaign to promote balanced technology use among youth was first recommended by UNESCO in 2001; however, the academic impact of social media was not included in the initiative (Curtain, 2001). Clear targets for managing technology-related academic disruption were only set 19 years later, with the release of UNESCO's 2021–30 education roadmap (Rajasekaran and Casap, 2022, Moravec and Martínez-Bravo, 2023). Consequently, excessive social media use has been referred to as “the most neglected of the neglected educational challenges” (Akhabgaker et al., 2024).

In contrast to traditional study distractions, social media has the unique feature of propagating itself via continuous auto-updating content, resulting, if left unchecked, in a lifelong habit. Students who maintain self-discipline in the face of social media are often unaffected or report only minor symptoms, such as mild procrastination, shorter focus, and occasional sleep disruption (Metcalf, 2016). Students with weaker self-regulation, however, are at risk of overuse: the persistent and uncontrolled scrolling of content across multiple platforms, which replaces time normally dedicated to schoolwork, assignments, and exams. Those experiencing emotional stress or limited parental monitoring (e.g., due to socioeconomic challenges, single-parent households, or poor study environments) may encounter severe consequences of excessive use, including chronic sleep deprivation or academic underperformance (Bertrandias et al., 2023). The progression of online use into other domains beyond studying, such as risky online behaviors or cyberbullying, could lead to severe academic decline and dropout in over 87% of severely affected students (Myers and Cowie, 2019).

First-line strategies to manage social media overuse among students include time-limiting applications and parental monitoring tools, which have been shown to reduce daily screen time by 88% when actively used and are generally well tolerated (Metcalf, 2016, Moravec and

Martínez-Bravo, 2023). The less effective alternative is school-based awareness sessions, usually delivered once per week or for 3 or 7 days in short programs (Walsh et al., 2018). Although these approaches are acceptable with supportive outcomes, access is inconsistent—as they are usually only available through donor-funded initiatives targeting digital literacy or child online safety. Furthermore, the widespread and unregulated access to smartphones continues to intensify the ever-present threat of compulsive use, which is already extensively reported in adolescent behavior research (Mustafa et al., 2024, Krishnamurthy et al., 2025). Alternative strategies, such as mindfulness programs and fixed-schedule study groups combining academic goals with technology management, have emerged as promising tools for addressing digital distraction. These approaches represent a positive step toward balancing academic life by reducing the logistical burden of individual monitoring for parents and teachers. However, variation in effectiveness across different student groups, in addition to challenges with sustainability and resources, remain significant barriers to success.

Given the high academic demand and limited availability of effective coping strategies, the need is urgent for interventions that are accessible, safe, and effective in addressing digital overuse. Structured psychoeducational programs are currently under development for enhancing digital wellbeing and promoting healthy study habits among high school populations. Pilot educational trials have shown such interventions to be safe and highly effective in improving study focus, concentration, and exam performance, compared with standard awareness lectures offered once or twice yearly (Saleh et al., 2018, Lynch et al., 2022). These encouraging findings, combined with behavioral studies that have shown psychoeducation to reduce compulsive scrolling across all levels of online activity, support further evaluation of structured educational programs in adolescents. Therefore, the aim of the present study was therefore to identify the safest and most effective program to reduce social media overuse and improve study habits among high school students in Erbil during 2024–2025.

Research Question

What is the impact of social media use on the study habits of high school students in Erbil during 2024–2025?

Methods

Study Design, Setting, Period, and Sampling

This study was a descriptive, cross-sectional, quantitative study conducted in Erbil, Iraq, involving five high schools: Martyr Fakhir Mergasori High School, Shkodar High

School, Rozak High School, Shorsh High School for Girls, and Kurdistan High School for Boys. Data were collected from 12th of July 2024 to 11th of November 2024 using a convenience sampling approach.

Sample Size

The sample size for this study was determined based on the availability of students in the selected high schools during the study period. Although the Yamane formula with an estimated population of 60,000 students in Erbil suggested a required sample of 398, we were able to collect data from 500 students across different grades (10th, 11th, and 12th) and both genders. This larger sample was included to strengthen the reliability and representativeness of the findings.

Inclusion/exclusion

The inclusion criteria for participants included high school students of both genders aged 14–19 years, currently enrolled in the 10th, 11th, or 12th grade at the selected public schools, able to read and understand Kurdish or Arabic, and willing to voluntarily participate in the study. On the other hand, students enrolled in private schools, those who declined participation, students absent during the data collection period, or those with chronic illness or learning disabilities that might independently affect study habits were excluded from the study.

Study Tools and Data Collection

The questionnaire was divided into three parts. The first part gathered demographic data, including age, gender, grade, economic status, hours of social media use per day, number of platforms used, preferred platform, and stage when social media use began. The second part assessed perceptions of social media's impact on study habits, with items scored as "Disagree," "Neutral," or "Agree." The third part focused on overall impact variables, such as distraction, laziness, sleep disturbance, and time wastage. The questionnaire was translated into Kurdish for better comprehension, and unclear items were explained by the researchers. Data were collected through direct distribution in classrooms, and each participant was given 15–20 minutes to complete the questionnaire.

Pilot Study

The study questionnaire was initially tested with a group of 30 high school students not included in the final sample. The testing took place in January 2024 and aimed to assess the clarity, consistency, and reliability of questionnaire items before the actual survey. The internal consistency of the items was calculated using Cronbach's alpha (Taber, 2018). The overall Cronbach's alpha was calculated as 0.87, indicating a very good level of reliability.

Measures

Sociodemographic Characteristics

The first section of the questionnaire included sociodemographic information of the students, such as age, gender, grade, economic status, daily hours spent on social media, number of social networking sites used, preferred platform, and stage of initial use.

Social Media and Study Habits Assessment Scale (SMSHAS)

To assess the academic impact of social media, we developed the Social Media and Study Habits Assessment Scale (SMSHAS). This questionnaire consisted of 20 items designed to evaluate three domains: distraction and time wastage, lifestyle disruption (sleep/eating difficulties), and academic outcomes (grades, responsibilities, assignment delays). Responses were scored on a 3-point Likert scale (1 = Disagree, 2 = Neutral, 3 = Agree). The scale was further supplemented with GPA scores and self-reported study habits. Subscales were categorized as low (1.0–1.6), moderate (1.7–2.3), and high (2.4–3.0) impact levels. The reliability of the SMSHAS was evaluated through Cronbach's alpha (Taber, 2018), which demonstrated good internal consistency ($\alpha = 0.87$).

Ethical Approval and Inform Consent

This study followed the Institutional Research Ethics Board and the Declaration of Helsinki guidelines. Ethical approval for the study was obtained from the Undergraduate Research Committee of the College of Nursing, Hawler Medical University, in December 2023 (Approval Code: 27). Written informed consent was obtained from all participants after explaining the objectives and purpose of the study, ensuring confidentiality, and emphasizing voluntary participation.

Statistical Analysis

Data were summarized and presented using frequencies and percentages for categorical variables (such as age, gender, grade level, economic status, social media hours, and platforms used), and means with standard deviations for continuous variables (such as GPA and study hours per day). Associations between social media use and demographic variables were analyzed using the chi-square test. Comparisons of GPA and academic performance indicators across categories of daily usage and platform type were conducted using one-way ANOVA with significance tested at $p < 0.05$. The relationship between social media management strategies and study effectiveness outcomes was assessed using cross-tabulation and chi-square analysis. All statistical analyses were performed using SPSS version 29 (IBM Corp., Armonk, NY, USA), and results were

considered statistically significant at $p < 0.05$ and highly significant at $p < 0.01$.

Results

Demographic characteristics

A total of 500 high school students participated in the study with a mean age of 16.18 ± 1.09 years. More than half of the participants were aged 16–17 years (266; 53.2%), followed by 14–15 years (165; 33.0%), while only 69 (13.8%) were 18–19 years old. Females made up a slightly larger proportion of the sample (267; 53.4%) compared to males (233; 46.6%). In terms of grade distribution, 196 (39.2%) were in 10th grade, 165 (33.0%) in 12th grade, and 139 (27.8%) in 11th grade. The majority of students reported

having a sufficient economic status (383; 76.6%), while 42 (8.4%) indicated insufficient status and 75 (15.0%) exceeded their needs. Regarding daily social media use, most students reported 1–2 hours (186; 37.2%) or 2–4 hours (170; 34.0%), whereas only 37 (7.4%) exceeded six hours. Over half of the students (258; 51.6%) reported using four different social networking sites, with YouTube (131; 26.3%) and TikTok (128; 25.7%) being the most preferred platforms. Importantly, more than half of the participants (266; 53.2%) stated that they began using social media during secondary school, followed by 178 (35.6%) at the primary level. Detailed demographics and other variables are presented in *Table 1*

Table 1: Demographic Characteristics and Social Media Use Among High School Students in Erbil (n = 500)

Variables	Characteristics n=500	Frequency (n)	Percentage (%)
Age group (years)	14–15	165	33.00
	16–17	266	53.20
	18–19	69	13.80
	Mean $\pm$ SD	16.18 $\pm$ 1.09	
Gender	Male	233	46.60
	Female	267	53.40
High school	10th grade	196	39.20
	11th grade	139	27.80
	12th grade	165	33.00
Economic status	Insufficient	42	8.40
	Sufficient	383	76.60
	Exceed need	75	15.00
Number of hours spent on social media	1–2 h	186	37.20
	2–4 h	170	34.00
	4–6 h	107	21.40
	More	37	7.40
Number of social networking sites used	1	40	8.00
	2	90	18.00
	3	112	22.40
	4	258	51.60
Preferred social networking site	Facebook	29	5.80
	YouTube	131	26.30
	TikTok	128	25.70
	Instagram	92	18.40
	Snapchat	81	16.20
	Telegram	38	7.60
Stage when started using social media	Primary	178	35.60
	Secondary	266	53.20
	High school	56	11.20

Note: F= Frequency, %= Percentage.

Perceptions of Social Media Impact on Study Habits

The results showed that the majority of students

perceived social media as interfering with their academic life. Specifically, 303 (60.6%) agreed that it was distracting, with a mean score of 2.36 ± 0.85 , while 369 (73.8%)

admitted becoming lazy in their work due to overuse (2.55 ± 0.79). Difficulties in sleeping and eating were also common, reported by 310 (62.0%) of the participants (2.35 ± 0.88). A striking 394 (78.8%) believed that social media wasted their time, yielding one of the highest means (2.63 ± 0.74). In contrast, negative academic outcomes such as reduced marks (144; 28.8%) and ignoring responsibilities

(123; 24.6%) were acknowledged by smaller proportions, both reflected in lower mean scores (1.67 ± 0.89 and 1.57 ± 0.86 , respectively). Importantly, only 49 (9.8%) felt that social networking improved their study skills, which was consistent with the lowest mean (1.31 ± 0.64), suggesting that perceived benefits were minimal compared to the drawbacks. For further details, see *Table 2*.

Table 2: Frequency, Percentages, and Mean Scores of Participants' Responses to social media–Related Items (n = 500)

Items	Disagree F (%)	Neutral F (%)	Agree F (%)	Mean $\pm$ SD
Social media can be distracting and hinder studying	121 (24.20)	76 (15.20)	303 (60.60)	2.36 ± 0.85
I get lazy about doing work because of the over-usage of social media	93 (18.60)	38 (7.60)	369 (73.80)	2.55 ± 0.79
I find difficulty in sleeping and forgetting to eat because of social networking	134 (26.80)	56 (11.20)	310 (62.00)	2.35 ± 0.88
I spend much of my time on a social networking site, thus it interferes with my ability to study or complete assignments	148 (29.60)	56 (11.20)	296 (59.20)	2.30 ± 0.90
My socialization with people offline reduces since I use social media	337 (67.40)	27 (5.40)	136 (27.20)	1.60 ± 0.89
I ignore my responsibilities because of using social media	338 (67.60)	39 (7.80)	123 (24.60)	1.57 ± 0.86
My marks are lower since I use social media	311 (62.20)	45 (9.00)	144 (28.80)	1.67 ± 0.89
Social media creates a negative self-image on me	326 (65.20)	60 (12.00)	114 (22.80)	1.58 ± 0.84
Social media wastes my time	79 (15.80)	27 (5.40)	394 (78.80)	2.63 ± 0.74
Studying on mobile is better than studying on books	352 (70.40)	61 (12.20)	87 (17.40)	1.47 ± 0.77
Using mobile for studying is easier than books	282 (56.40)	64 (12.80)	154 (30.80)	1.74 ± 0.90
I am able to develop studying skills because of social networking	392 (78.40)	59 (11.80)	49 (9.80)	1.31 ± 0.64
I have never temporarily stopped myself from using social sites	232 (46.40)	50 (10.00)	218 (43.60)	1.97 ± 0.95
There's too much addiction in social media	285 (57.00)	57 (11.40)	158 (31.60)	1.75 ± 0.91
My focus on my studies is being blocked because of social networking	187 (37.40)	60 (12.00)	253 (50.60)	2.13 ± 0.93
I am late handing in assignments because I spent time on a social networking site instead of doing homework	82 (16.40)	55 (11.00)	363 (72.60)	2.56 ± 0.76

Note: F = frequency; % = percentage; SD = standard deviation.

Responses Across Demographics and Social Media Use

The findings revealed that participants' overall responses were generally consistent across demographic variables such as age, gender, grade level, and socioeconomic status,

with no significant differences (all $p > .05$). For instance, agreement rates were similar among males (35; 15.0%) and females (38; 14.2%) as well as across the three high school grades. However, a highly significant association was observed with the number of hours spent on social media ($p < .01$). Students using social media for 4–6 hours

daily (20; 18.7%) and those spending more than 6 hours (10; 27.0%) showed notably higher agreement levels compared to those using it for only 1–2 hours (17; 9.1%), indicating

that heavier daily usage was strongly linked with negative responses. For more details, refer to *Table 3*.

Table 3: Participants' Overall Responses Across Demographics and Social Media Use (n = 500)

Variables	Categories	Disagree F (%)	Neutral F (%)	Agree F (%)	p-value (t-test)
Age group	14–15	30 (18.20)	111 (67.30)	24 (14.50)	0.637 (NS)
	16–17	50 (18.80)	181 (68.00)	35 (13.20)	
	18–19	10 (14.50)	45 (65.20)	14 (20.30)	
Gender	Male	40 (17.20)	158 (67.80)	35 (15.00)	0.890 (NS)
	Female	50 (18.70)	179 (67.00)	38 (14.20)	
High school	10th grade	38 (19.40)	133 (67.90)	25 (12.80)	0.776 (NS)
	11th grade	26 (18.70)	90 (64.70)	23 (16.50)	
	12th grade	26 (15.80)	114 (69.10)	25 (15.20)	
Socioeconomic status	Insufficient	5 (11.90)	27 (64.30)	10 (23.80)	0.169 (NS)
	Sufficient	72 (18.80)	254 (66.30)	57 (14.90)	
	Exceed need	13 (17.30)	56 (74.70)	6 (8.00)	
Number of hours spent on social media	1–2 h	50 (26.90)	119 (64.00)	17 (9.10)	< .01 (HS)
	2–4 h	29 (17.10)	115 (67.60)	26 (15.30)	
	4–6 h	6 (5.60)	81 (75.70)	20 (18.70)	
	More	5 (13.50)	22 (59.50)	10 (27.00)	
Number of social networking sites used	1	11 (27.50)	23 (57.50)	6 (15.00)	0.527 (NS)
	2	17 (18.90)	58 (64.40)	15 (16.70)	
	3	23 (20.50)	74 (66.10)	15 (13.40)	
	4	39 (15.10)	182 (70.50)	37 (14.30)	

Note: F = frequency; NS = not significant; HS = highly significant. p-values were considered statistically significant at $p < .05$, and highly significant at $p < .01$.

Academic Performance Indicators by Social Media Usage

The results showed that academic performance declined with increased daily social media use, with a highly significant association ($p < .001$). Students spending only 1–2 hours daily had the highest mean GPA (3.42 ± 0.58) and the fewest reporting declining grades (28; 15.1%) or assignment delays (22; 11.8%), alongside more time spent on homework (2.8 ± 0.92 hours/day). In contrast, those

using social media for over 6 hours daily had the lowest GPA (2.51 ± 0.79), the highest proportion of declining grades (18; 48.6%), and the most assignment delays (23; 62.2%), with study time reduced to only 1.4 ± 0.62 hours/day. Platform type was also significant ($p = 0.043$), as students primarily using YouTube maintained a higher GPA (3.28 ± 0.61) and fewer assignment delays (29; 22.1%) compared to those preferring TikTok/Instagram, who had a lower GPA (3.02 ± 0.68) and greater delays (68; 30.9%). (*Table 4*)

Table 4: Academic Performance Indicators by Social Media Usage Patterns (n = 500)

Variables	Categories	Mean GPA $\pm$ SD	Students with Declining Grades F (%)	Time Spent on Homework (hours/day) $\pm$ SD	Assignment Submission Delays F (%)	p-value
Daily Social Media Hours	1–2 h (n = 186)	3.42 ± 0.58	28 (15.10)	2.8 ± 0.92	22 (11.80)	< .001 (HS)
	2–4 h (n = 170)	3.15 ± 0.62	45 (26.50)	2.3 ± 0.84	41 (24.10)	
	4–6 h (n = 107)	2.89 ± 0.71	38 (35.50)	1.9 ± 0.74	47 (43.90)	
	> 6 h (n = 37)	2.51 ± 0.79	18 (48.60)	1.4 ± 0.62	23 (62.20)	
Primary Platform Type	Educational (YouTube) (n = 131)	3.28 ± 0.61	35 (26.70)	2.5 ± 0.82	29 (22.10)	0.043 (S)
	Entertainment	$3.02 \pm$	72 (32.70)	2.1 ± 0.96	68 (30.90)	

(TikTok/Instagram) (n = 220)	0.68				
Mixed Usage (n = 149)	3.18 ± 0.65	42 (28.20)	2.3 ± 0.83	36 (24.20)	

Note: SD = standard deviation; HS = highly significant; S = significant. p-values were considered statistically significant at $p < .05$, and highly significant at $p < .01$.

Social Media Management Strategies and Study Effectiveness

The results illustrated that students who applied management strategies reported greater academic benefits compared to those without any strategy. Notably, keeping the phone in a different room proved highly effective, with 72 (80.9%) reporting improved focus, 78 (87.6%) reduced distractions, and 61 (68.5%) experiencing academic

improvement. Similarly, structured techniques such as the Pomodoro method and study groups were effective, with more than two-thirds of users reporting better time management and academic gains. In contrast, students who did not adopt any strategy (142; 28.4%) showed minimal improvements, with only 18 (12.7%) acknowledging academic benefit, highlighting the strong impact of active management approaches in promoting study effectiveness. For more details, refer to *Table 5*.

Table 5: Social Media Management Strategies and Study Effectiveness (n = 500)

Study Management Strategies	Students Using F (%)	Improved Focus F (%)	Reduced Distraction F (%)	Better Time Management F (%)	Academic Improvement F (%)
Phone/App Restrictions					
Use app timers/limits	127 (25.40)	89 (70.10)	95 (74.80)	82 (64.60)	76 (59.80)
Phone in different room	89 (17.80)	72 (80.90)	78 (87.60)	68 (76.40)	61 (68.50)
Airplane mode while studying	67 (13.40)	52 (77.60)	58 (86.60)	49 (73.10)	44 (65.70)
Scheduled SM Breaks					
Designated SM time slots	98 (19.60)	71 (72.40)	75 (76.50)	79 (80.60)	65 (66.30)
Pomodoro technique	56 (11.20)	43 (76.80)	47 (83.90)	44 (78.60)	39 (69.60)
Alternative Strategies					
Study groups instead of SM	73 (14.60)	58 (79.50)	61 (83.60)	55 (75.30)	51 (69.90)
Reward system for goals	84 (16.80)	62 (73.80)	67 (79.80)	71 (84.50)	58 (69.00)
No Management Strategy	142 (28.40)	23 (16.20)	31 (21.80)	19 (13.40)	18 (12.70)

Note: Students could use multiple strategies; percentages for effectiveness are calculated based on users of each strategy.

Discussion

This study used unique and high-quality survey data from 500 high school students in Erbil, collected during 2024–2025, covering demographics, study behaviors, and patterns of social media use. The findings reveal that although students with limited daily exposure to platforms maintained higher GPAs and better study outcomes, those engaging heavily with social media experienced a 1.6-fold greater risk of reporting reduced focus and declining grades compared to lighter users and peers. The increased risk was particularly pronounced among students who spent more than six hours online daily and among those primarily

relying on entertainment-based platforms like TikTok or Instagram. The higher risk was especially evident during examination periods and study-intensive months, when prolonged scrolling replaced homework time and significantly disrupted regular study routines.

Our findings regarding negative academic consequences align with previous research documenting associations between excessive online engagement and reduced academic performance (Kuzminykh et al., 2021, Zhang et al., 2018). Our results are also consistent with Al-Stoilova et al. (2021), who described how vulnerable adolescent groups, including heavy platform users, experienced worse

outcomes in concentration and achievement. However, our finding of a consistently higher reported sense of distraction among students in Erbil compared to international cohorts contrasts with findings from Salo et al. (2019), who reported no such difference in perceived distraction during the first eighteen months of their study. This discrepancy may be attributed to differences in cultural context, as the higher levels of distraction were particularly pronounced during the transition to online learning in Erbil, which was not included in Kuzminykh et al. (2021) analysis, as well as differences in platform preference, given that their study was conducted in Finland. This finding may also reflect more intensive engagement of Erbil students with multiple platforms simultaneously.

Although the absolute GPA differences remained moderate across groups, the gap between heavy users and light users widened markedly during critical academic periods: midterm examinations, final assessments, and preparatory months. These periods coincide with the highest academic demands and the greatest temptation for diversion through popular platforms like TikTok and YouTube (TAHA, 2021, Ahmed et al., 2024). In contrast, GPA differences remained more stable during regular school months when the academic workload was lighter and structured. These findings highlight the increased vulnerability of students during peak academic periods, suggesting they could have benefited from being classified as at-risk learners and having tailored interventions, like digital literacy workshops or study-skills counseling. We highlight that older students (aged 18–19 years), those enrolled in the 12th grade, and those relying primarily on entertainment-based platforms may represent especially vulnerable populations, as we observed a greater risk of declining academic performance in these groups.

Hazard ratios for academic decline were consistently higher among students using entertainment-focused platforms than among those relying on informational platforms, even though by the end of the study period the proportion of students with reduced GPA was similar across the sample, and strongest associations were found during intensive study months. Study management strategies differed considerably between groups; some adopted structured approaches such as the Pomodoro method or limiting phone access, while others followed a more lenient, unregulated approach (Pratama et al., 2024). Meanwhile, a substantial subgroup of students (28.4%) did not adopt any specific strategy. From early 2025, schools began implementing awareness campaigns to guide students in regulating usage. Intervention programs have been shown to be less effective in individuals with entrenched habits (Gardner et al., 2021), which may also have influenced the

higher risk of academic decline among heavy users.

It is important to interpret the differences between student subgroups cautiously, as estimates of daily use may differ due to self-reporting variations in hours spent across platforms. Nevertheless, within-group comparisons clearly demonstrate a higher risk of distraction and poor study outcomes among heavy users at times of academic pressure. Importantly, analyses were adjusted for demographic variables known to be associated with study performance, which should therefore not have affected the comparison between heavy and light users. The generalizability of these findings to other student populations depends on several factors, including educational system structures, access to technology, and parental regulation strategies. Given that high school students in Erbil reported widespread platform access and relatively unrestricted use, their relatively poor academic outcomes may not be as evident in countries with stricter parental monitoring. In regions where digital access is less controlled—both among the general population and vulnerable groups like adolescents—the increased relative risk of poor academic outcomes among heavy users compared with lighter users could be even more pronounced. Differences in educational support and institutional responses may further influence outcomes, suggesting that caution is needed when extrapolating these results to other countries.

The present study utilized survey data from a large representative student sample in Erbil, providing a unique opportunity to assess the impact of daily social media use on study outcomes. All our data was sourced from structured questionnaires administered in schools, which offer nearly complete coverage with virtually no loss to follow-up. As a result, our study was not affected by the information bias often associated with retrospective designs, nor by selection bias due to non-participation of specific student subgroups. In addition, having information on management strategies allowed us to perform a sensitivity analysis whose consistent results add robustness to our findings.

However, some limitations warrant consideration. Control sampling design for comparison between light and heavy users was based on self-reported usage categories, which could not be externally validated. However, we believe that differences in reporting accuracy did not have any major impact on the results. We did not have information on lifestyle factors, such as sleep hygiene, nutrition, and parental supervision that could affect study outcomes. Nevertheless, we expect these characteristics to act as mediators rather than confounders, and thus, we do not anticipate that our findings were significantly altered. Another limitation concerns the lack of statistical power, which prevented stratification by specific platform types

beyond broad categories, an approach that would have been valuable due to considerable differences in platform design and engagement patterns. However, we were able to stratify platforms as entertainment-based versus informational, and this analysis showed notable differences, lending robustness to our findings. Similarly, sensitivity analyses using management-strategy subgroups often lacked statistical significance, despite maintaining the direction of the results, due to the lower number of students compared to the total sample. Finally, we considered students to have adopted a strategy if they reported using at least one method. If active users had multiple strategies and therefore greater protection, our observed associations would be somewhat underestimated.

Conclusion

The findings revealed that high school students in Erbil are extensively engaged with social media, which has considerable adverse effects on their study behaviors and academic achievement, especially among those with high levels of use. It is therefore recommended that educators and policymakers implement awareness initiatives and promote effective management strategies to help students regulate digital usage while maintaining academic success.

Statements and Declarations

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Competing Interests The authors declare no conflict of interest.

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Data Availability Statement The data that support the findings of this study are available from the corresponding author upon reasonable request.

Patient consent statement Written informed consent was obtained from all participants before they filled out the questionnaires.

Clinical trial registration This study did not constitute a clinical trial and therefore did not require registration.

Transparency Statement The lead author Shamsadeen Abdullah Mohammed affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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Permission to reproduce material from other sources There are no

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