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# *Social Media Use and Sleep Health among Adolescents*

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***Abstract.*** This paper examines the proposed association between social media use and sleep health among adolescents. It uses an exploratory, school-based cross-sectional questionnaire with a planned convenience sample of 40 students aged 13–18 years. The study distinguishes total daily use from use in the hour before attempted sleep, checking after lights out, notification disruption, and difficulty disengaging from social media. Sleep outcomes are usual sleep duration, sleep-onset latency, nocturnal waking, self-rated sleep quality, and daytime sleepiness. The accompanying questionnaire uses a 7-day recall period and does not diagnose any sleep, mental-health, or addiction condition. Analyses will primarily be descriptive and exploratory because the small sample is not suitable for complex adjusted modelling. The report provides a transparent basis for collecting and interpreting preliminary evidence while protecting participants' privacy and voluntary participation. Given the exploratory design and convenience sampling approach, the findings will be interpreted cautiously and will not be generalized to adolescents beyond the participating sample. The results may nevertheless help identify potentially relevant behavioural patterns and variables for future studies using larger samples, broader populations, and more rigorous research designs.

***Keywords:*** Social media use, Adolescents, Sleep quality, Sleep duration, Bedtime media use

## 1. Introduction

Sleep supports adolescents' health, learning, emotional regulation, and daytime functioning. Teenagers are commonly advised to obtain 8–10 hours of sleep per 24 hours [1]. However, biological preference for later sleep timing can conflict with early school schedules, homework, extracurricular activities, and evening digital-media use. Social media is particularly relevant because it is portable, interactive, and readily available in the bedroom.

Research on young people consistently associates screen exposure with shorter sleep and delayed bedtime. A systematic review found that screen time was adversely associated with sleep outcomes in most included studies, while also identifying important limitations in causal inference and measurement [2]. A meta-analysis further linked bedtime access to or use of portable media devices with insufficient sleep, poor sleep quality, and excessive daytime sleepiness [3]. These findings make it important to examine when and how adolescents use social media, not merely the total amount of time spent on a screen.

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The present study will explore whether social media use is associated with sleep health in a small school-based sample. It focuses on use close to bedtime, after-lights-out checking, and notification-related disruption, while also recording age, gender, grade, study workload, physical activity, caffeine use, and device location. The purpose is exploratory: to describe patterns in the participating students and identify questions for a larger future study, not to estimate population prevalence or prove causation.

Based on the content of the study, several core research questions are formulated as follows:

How are total social media use, pre-sleep social media use, and checking after lights out associated with sleep duration and self-rated sleep quality?

Are notification disruption and difficulty disengaging from social media associated with sleep-onset difficulty, nocturnal waking, and daytime sleepiness?

What patterns can be observed in a 40-student exploratory school sample?

## 2. Literature review

### 2.1. Screen exposure, sleep duration, and sleep timing

A review of 36 studies of school-aged children and adolescents identified delayed bedtime and shorter total sleep time as the most consistently reported correlates of electronic-media use [4]. The later systematic review by Hale and Guan reached a similar overall conclusion and noted that study quality was constrained by self-reported exposure and sleep measures, limited information about simultaneous screen use, and the inability of many studies to establish causality [2]. Therefore, the present study records school-day and non-school-day sleep timing separately and does not interpret an association as evidence of a causal effect.

Device access itself may matter in addition to active use. The meta-analysis by Carter and colleagues found associations between bedtime device access or use and inadequate sleep quantity, poor sleep quality, and daytime sleepiness [3]. Accordingly, the questionnaire records whether the main internet-connected device is outside the bedroom, in the bedroom, or in or beside the bed while the student sleeps.

### 2.2. Social media specific evidence

Social media may affect sleep differently from other screen activities because it includes social feedback, notifications, emotionally salient content, and pressure to respond. In a study of 467 Scottish adolescents, overall use, nighttime-specific use, and emotional investment in social media were associated with poorer sleep quality; nighttime-specific use remained associated after accounting for anxiety, depression, and self-esteem [5]. In a large UK cohort analysis, social media use was associated with unfavourable sleep patterns, and use of three or more hours per day was linked with later sleep onset and nocturnal waking [6].

Evidence from young adults also suggests that greater social media use is associated with sleep disturbance, although young adults are not directly comparable with secondary-school students [7]. In an adolescent sample, daily social networking-site use above two hours was independently associated with poorer self-rated mental health and psychological distress [8]. These findings underline the possibility of confounding and bidirectionality: sleep problems may influence online behaviour, online experiences may affect wellbeing, and wellbeing may affect both sleep and online behaviour.

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### 2.3. Mechanisms and study rationale

Three mechanisms provide a rationale for measuring bedtime-specific behaviour. First, time displacement occurs when scrolling, messaging, or viewing short videos replaces time available for sleep. Second, social or emotional arousal may delay disengagement, particularly when a student anticipates a response or fears missing online activity. Third, evening screen light may affect circadian processes. In a controlled experiment, using a light-emitting eReader before bed was associated with longer time to fall asleep, reduced evening sleepiness, melatonin suppression, delayed circadian timing, and reduced next-morning alertness compared with reading a printed book [9].

At a population level, self-reported short sleep among U. S. adolescents increased between 2009 and 2015, and greater new-media screen time was associated with shorter sleep [10]. Technology use in the hour before bed is also common across age groups [11]. Together, these findings support a focused questionnaire that separates total social media time from bedtime use, notifications, and after-lights-out checking. However, the existing evidence also supports caution: the current study is cross-sectional, uses self-report, and has a small convenience sample.

## 3. Methodology

### 3.1. Study design, setting, and sample

This study will use an anonymous, school-based cross-sectional questionnaire. The planned sample is 40 students aged 13–18 years from participating secondary-school classes. Recruitment will use a convenience approach through available classes; it is not a random sample. Students may participate only after receiving an age-appropriate information sheet and providing assent. Parent or guardian consent will also be obtained if required by the school or relevant ethics process. Participation is voluntary; students may skip questions or stop without penalty.

A sample of 40 is appropriate only for a small exploratory exercise. It can describe the participating students and indicate possible patterns, but it cannot reliably estimate population prevalence, support precise subgroup comparisons, or justify a complex multivariable model with numerous covariates. The results will therefore be presented as preliminary findings from this specific sample, with uncertainty and potential bias stated clearly.

### 3.2. Questionnaire design and measures

The study will use the Social Media and Sleep Health Questionnaire (SMSHQ). It is a researcher-developed, non-clinical questionnaire with a 7-day recall period. The content reflects bedtime device access, nighttime use, emotional engagement, and sleep indicators identified in previous research [3, 5, 6, 9, 11]. It neither diagnoses insomnia nor labels any participant as addicted. The questionnaire should be checked for clarity with a small number of students before administration; such checking does not replace formal psychometric validation (Table 1).

Table 1. Questionnaire constructs, measures, and planned analyses

| | | |
|---|---|---|
| Total social media use | Typical daily time on school days and non-school days | Exposure; ordered categories |
| Bedtime social media behaviour | Use during the hour before sleep; after-lights-out checking | Primary exposures; ordered categories |

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Table 1. (continued)

| | | |
|---|---|---|
| Disruption and disengagement | Notifications; difficulty stopping; concern about missing activity | Individual exploratory indicators |
| Sleep health | Usual sleep duration; sleep-onset latency; waking; self-rated quality; daytime sleepiness | Separate outcome indicators |
| Potential covariates | Age, gender, grade, workload, activity, caffeine, device location | Descriptive context; limited exploratory comparison only |

### 3.3. Procedure and ethics

Obtain school permission and any required institutional ethics approval before recruiting students.

Administer the questionnaire privately during a supervised school period or by an approved secure online form.

Do not collect names, contact details, social-media account names, or other direct identifiers in the questionnaire data.

Store de-identified data in an access-controlled file and report results only in aggregate form.

Provide an appropriate school counsellor or health-service contact for students who become concerned about sleep or wellbeing.

### 3.4. Analysis plan

Analysis will prioritise clear descriptive reporting. For the 40 respondents, the report will present counts and percentages for categorical answers, and medians with ranges or means with standard deviations for numerical values where appropriate. Exploratory comparisons may examine whether students reporting more bedtime social media use also report shorter sleep duration or poorer sleep indicators. Any correlation or group-comparison result will be reported with its sample size and uncertainty, and it will not be treated as definitive.

Because the planned sample is only 40, the study will not fit a complex adjusted regression model containing all proposed covariates. If exploratory analyses are performed, they will use a small number of clearly justified comparisons and will avoid over-interpreting p values. Missing answers will be reported for each item. The analysis will not infer that social media use caused a sleep outcome, because reverse causation, unmeasured factors, and selection effects remain possible.

## 4. Discussion

Based on the literature, students who report more social media use near bedtime or after lights out may also report shorter usual sleep, poorer self-rated sleep quality, longer sleep-onset latency, more nocturnal waking, or greater daytime sleepiness. Notification-related disruption and difficulty stopping use may be particularly relevant because they capture the timing and interruption of behaviour rather than total daily use alone. However, the 40-student design cannot determine whether such patterns occur consistently beyond the participating group.

If the observed patterns are consistent with the hypotheses, the practical interpretation should focus on feasible sleep-protective routines: establishing a pre-sleep period without social media, silencing notifications, and keeping the primary device out of reach at night. If no pattern appears, this may reflect low statistical precision, limited variation in behaviour, or the influence of other factors such as workload and caffeine. Either outcome should be used to refine future research rather than to make broad claims about all adolescents.

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## 5. Conclusion

This report sets out an exploratory investigation of social media use and sleep health among 40 adolescents. It distinguishes total use from bedtime and after-lights-out behaviours, uses a transparent non-clinical questionnaire, and protects privacy through anonymous data collection. The study may identify useful local patterns for sleep-health education, but it cannot establish cause and effect. Most importantly, the small convenience sample may introduce sampling bias, random variation, imprecise estimates, and limited ability to generalise findings to other students or schools. Results must therefore be reported as preliminary and should be followed by a larger, more diverse study if stronger conclusions are needed.

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