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+15878858911
editorial-office@sciformat.ca

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SCREEN TIME AND SLEEP DISTURBANCES IN ADOLESCENTS: A NARRATIVE REVIEW

Krzysztof Sebastian Habirek (Corresponding Author, Email: krzychu.habirek@gmail.com)

University Clinical Hospital in Opole, Poland

ORCID ID: 0009-0004-7151-5949

Maja Maria Porażko

University Clinical Hospital in Opole, Poland

ORCID ID: 0009-0001-0248-4884

Anna Katarzyna Żurakowska-Zadrożna

University Clinical Hospital in Opole, Poland

ORCID ID: 0009-0006-0130-0576

Adrianna Krupska

Medical University of Silesia in Katowice, Poland

ORCID ID: 0009-0008-1710-1381

Julia Anna Czarnecka

Poznan University of Medical Sciences, Poland

ORCID ID: 0009-0008-2804-065X

Zuzanna Marta Marcinkowska

Medical University of Lodz, Poland

ORCID ID: 0009-0001-3563-974X

Joanna Zuzanna Gugulska

Medical University of Silesia in Katowice, Poland

ORCID ID: 0009-0007-4624-515X

Anna Kropiwnicka

Collegium Medicum, University of Zielona Góra, Poland

ORCID ID: 0009-0002-2869-369X

Michał Kieres

University of Opole, Poland

ORCID ID: 0009-0001-4763-3089

Klaudia Karolina Wójcik

University of Opole, Poland

ORCID ID: 0009-0003-0668-4466

Aleksander Kacper Kierys

MSWiA Hospital in Wrocław, Poland

ORCID ID: 0009-0003-0810-041X

Dominika Habirek

University Clinical Hospital in Opole, Poland

ORCID ID: 0009-0005-2969-5437

Michał Mieczysław Parus

Wrocław Medical University, Poland

ORCID ID: 0009-0000-4679-7330

ABSTRACT

Sleep disturbances are common among adolescents and represent an important public health concern due to their effects on physical health, emotional regulation, cognitive functioning, and daytime performance. At the same time, screen-based behaviors have become a central component of adolescent life, raising concerns about their potential influence on sleep. This narrative review summarizes current evidence on the association between screen time and sleep disturbances among adolescents, with particular emphasis on sleep duration, sleep quality, sleep onset latency, bedtime, and insomnia-related outcomes. A targeted literature search was conducted in PubMed and Google Scholar in April and May 2026, and 15 key sources were included. The reviewed evidence consistently indicates that higher screen exposure is associated with poorer sleep outcomes. Large population-based studies and systematic reviews link increased screen time with shorter sleep duration, poorer subjective sleep quality, prolonged sleep onset latency, later bedtimes, and greater sleep deficiency. Several studies suggest graded associations, with higher levels of exposure generally corresponding to more adverse sleep outcomes. However, screen time should not be interpreted only as total duration. Timing of use, type of screen activity, sex, age, and environmental context may influence the strength and character of the association. Proposed mechanisms include circadian disruption, melatonin suppression, displacement of sleep time, and cognitive or emotional arousal. Current evidence supports screen exposure as a relevant behavioral factor in adolescent sleep health, although causal inference remains limited because much of the available evidence is observational and based on self-reported measures.

KEYWORDS

Screen Time, Adolescents, Sleep Disturbances, Sleep Quality, Sleep Duration, Digital Media Use

CITATION

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Introduction

Sleep disturbances are increasingly recognized as a major public health issue among adolescents, with growing evidence indicating high prevalence of insufficient sleep duration, impaired sleep quality, delayed sleep onset, and daytime dysfunction. Adequate sleep plays a fundamental role in physical health, cognitive functioning, emotional regulation, and academic performance during adolescence. Adolescence is additionally characterized by profound biological, behavioral, and psychosocial changes that naturally contribute to delayed sleep timing and increased vulnerability to sleep disturbances. Early school schedules, social demands, and increasing evening technology use may further exacerbate chronic sleep restriction and circadian disruption in this age group. (de Zambotti et al., 2018)

At the same time, the rapid expansion of digital technologies has led to a marked increase in daily screen exposure, making screen-based behaviors a central component of modern adolescent lifestyles. Smartphones, computers, tablets, and gaming devices are now widely integrated into education, communication, entertainment, and social interaction, often resulting in several hours of screen use per day. As screen exposure has increased globally, concerns regarding its potential impact on sleep health have also intensified. (Fiore et al., 2025; Naing et al., 2024; Silva et al., 2022)

A substantial body of research has reported that increased screen time is associated with adverse sleep outcomes among adolescents. Higher levels of screen exposure have been linked to shorter sleep duration, prolonged sleep onset latency, poorer sleep quality, and greater subjective sleep deficiency (Hysing et al., 2015; Maurya et al., 2022; Silva et al., 2022). Several studies further suggest a dose–response relationship, in which increasing duration of screen use corresponds to progressively worse sleep parameters (Hysing et al., 2015; Otsuka et al., 2021). These associations have been observed across different populations, geographic regions, and study designs, supporting the consistency of the relationship between screen exposure and sleep disturbances.

The mechanisms underlying these associations appear to be multifactorial. Experimental and observational evidence suggests that exposure to short-wavelength light emitted by electronic screens may suppress melatonin secretion and disrupt circadian regulation (Alam et al., 2024; Höhn et al., 2024). In addition, behavioral mechanisms such as delayed bedtimes, displacement of sleep time, and increased cognitive or emotional arousal may further contribute to impaired sleep quality and reduced sleep duration (Fiore et al., 2025). Emerging evidence also suggests that sleep disturbances may partially mediate the relationship between excessive screen exposure and broader mental health outcomes, including depressive symptoms and impaired psychological well-being (Li et al., 2019).

Despite the growing body of literature, considerable variability exists across studies regarding study populations, methods of measuring screen exposure, and definitions of sleep outcomes. Furthermore, while many studies report consistent associations between screen time and sleep disturbances, the magnitude and specific characteristics of these relationships vary between populations and research methodologies. Therefore, an integrative synthesis of current evidence is warranted.

The aim of this narrative review is to summarize and critically discuss current evidence regarding the association between screen time and sleep disturbances among adolescents, with particular emphasis on sleep duration, sleep quality, and sleep onset latency.

Methods

This narrative review was based on a targeted literature search conducted in April and May 2026 using PubMed and Google Scholar, supplemented by reference screening of relevant review articles. The aim was to identify key peer-reviewed publications examining the relationship between screen exposure and sleep outcomes among adolescents. The search included original observational studies, experimental studies, systematic reviews, and umbrella reviews.

Search terms included combinations of: “screen time,” “digital media,” “smartphone use,” “Internet use,” “social media,” “gaming,” “adolescents,” “sleep duration,” “sleep quality,” “sleep onset latency,” “insomnia,” and “circadian rhythm.” Studies were selected if they addressed screen exposure in adolescents and reported at least one sleep-related outcome, such as sleep duration, sleep quality, sleep onset latency, bedtime, insomnia symptoms, or daytime sleep-related impairment.

Particular attention was given to studies reporting quantitative associations between screen exposure and sleep outcomes, as well as studies discussing potential mechanisms, including circadian disruption, melatonin suppression, displacement of sleep time, and cognitive or emotional arousal. Studies focusing exclusively on adult populations or not reporting sleep-related outcomes were excluded.

Given the narrative design of this review, the literature was synthesized thematically rather than statistically. No formal meta-analysis was performed. A total of 15 key sources were included in the final review.

Results

Overall screen time and sleep outcomes

Hysing et al. (2015) investigated the association between screen use and sleep outcomes in a large population-based sample of 9,846 adolescents aged 16–19 years from the Norwegian youth@hordaland study, using self-reported questionnaire data. Screen exposure was assessed as total daily leisure screen time outside school hours, with particular emphasis on high exposure levels exceeding 4 hours per day. The study identified consistent associations between increasing screen time and multiple adverse sleep outcomes.

Adolescents reporting more than 4 hours of daily screen use had markedly increased odds of short sleep duration, particularly for very short sleep (<5 hours; OR = 3.64, 95% CI 3.06–4.33), with progressively higher odds of shorter sleep duration observed at increasing levels of screen exposure. In parallel, higher screen exposure was associated with significantly increased odds of sleep deficiency exceeding 2 hours (OR = 1.72, 95% CI 1.56–1.89), defined as the difference between reported sleep duration and perceived sleep need. A graded association was also observed for sleep onset latency, with adolescents engaging in high levels of screen use showing increased likelihood of prolonged sleep latency (>60 minutes; OR = 1.49, 95% CI 1.36–1.64). Similar patterns were found across different types of electronic devices, including computers, mobile phones, and gaming consoles, all of which were associated with increased odds of delayed sleep initiation and sleep deficiency.

Maurya et al. (2022) conducted a large cross-sectional study in India using data from the UDAYA survey (2018), including 16,292 adolescents and young adults from the states of Uttar Pradesh and Bihar. Screen exposure was assessed as self-reported smartphone use during the previous 24 hours and categorized into non-use, ≤ 2 hours, and > 2 hours per day. Sleep outcomes were defined as self-reported sleep problems experienced within the past 15 days. Associations between smartphone use and sleep problems were examined using multivariable logistic regression models adjusted for a broad range of socio-demographic and behavioral covariates.

The study reported an association between increasing levels of smartphone screen time and higher prevalence of sleep problems. Descriptive analyses showed that sleep problems were more frequent among individuals reporting higher screen exposure, particularly those reporting > 2 hours of smartphone use per day. For instance, among male adolescents, the prevalence of sleep problems increased from 14.61% in non-users to 22.46% in those reporting > 2 hours of daily smartphone use, with a similar pattern observed among females (20.86% vs 38.51%).

In adjusted analyses, adolescents who reported more than 2 hours of smartphone use in the previous 24 hours had significantly higher odds of experiencing sleep problems compared to non-users (AOR = 1.55, 95% CI 1.21–1.99). Notably, even moderate levels of smartphone use (≤ 2 hours per day) were associated with increased odds of sleep problems among adolescents (AOR = 1.23, 95% CI 1.05–1.43), with increased odds observed across multiple exposure levels.

Additional analyses showed marked sex differences in the prevalence of sleep problems, with females consistently reporting higher rates compared to males.

Naing et al. (2024) conducted a cross-sectional study among 547 adolescents aged 13–19 years in Brunei, using self-administered questionnaires and multi-stage cluster sampling. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while screen exposure was measured using the Screen Time Questionnaire (STQ). More than half of the participants (52%) were classified as having poor sleep quality, with a mean PSQI score of 5.98 ± 2.70 , indicating a substantial burden of poor sleep quality in this adolescent sample.

Screen exposure was high, particularly during weekends, with mean total screen time of 537.6 minutes on weekdays and 725.2 minutes on weekend days. Smartphones showed the highest median screen time across the week, reaching 400 minutes per day on weekends.

In simple linear regression analyses, both weekday and weekend screen time were significantly associated with higher PSQI scores. However, in the final multivariable model, weekend screen time remained the only screen-time variable independently associated with poorer sleep quality, with each additional hour of weekend screen exposure associated with a 0.044-point increase in global PSQI score (adjusted $\beta = 0.044$, 95% CI 0.004–0.084, $p = 0.032$).

In addition, female sex and increasing age were independently associated with higher PSQI scores, suggesting poorer sleep quality among girls and older adolescents in this sample.

Otsuka et al. (2021) conducted a large-scale repeated cross-sectional analysis using data from three national surveys (2012, 2014, and 2017), including a total of 248,983 Japanese adolescents. Internet screen time was categorized into < 1 , 1–3, 3–5, and ≥ 5 hours per day. The study reported graded associations between Internet screen time and multiple sleep outcomes, and this pattern was consistently observed across all survey years. Increasing duration of Internet use was associated with a higher likelihood of all assessed sleep problems, including insomnia, shorter sleep duration, later bedtimes, and poorer sleep quality. A graded pattern was observed across exposure categories, with progressively higher prevalence of sleep disturbances from the lowest to the highest levels of screen use. Even moderate levels of Internet use (1–3 hours per day) were associated with a higher prevalence of sleep problems compared to the lowest exposure group, with further increases observed in the 3–5 hour category.

Adolescents reporting ≥ 5 hours of daily Internet use exhibited markedly higher rates of sleep disturbances, including insomnia (31–33%), short sleep duration (39–42%), late bedtimes (37%), and very poor sleep quality (11–12%). In adjusted analyses, prolonged screen time (≥ 5 hours vs < 1 hour) was associated with significantly increased odds of insomnia (aOR = 1.71, 95% CI 1.61–1.81), later bedtime (aOR = 2.44, 95% CI 2.32–2.56), and poorer sleep quality (aOR = 1.62, 95% CI 1.54–1.71). The association with short sleep duration was also present, although comparatively less pronounced than for bedtime and sleep quality outcomes.

These associations were consistently observed across all survey years, with a similar pattern of increasing risk across screen time categories. Although the overall prevalence of insomnia, later bedtimes, and

poor sleep quality tended to decrease in later survey waves compared to 2012, the relationship between screen time and sleep outcomes remained stable. No significant gender differences were observed in the association between Internet screen time and sleep problems. However, female adolescents consistently reported shorter sleep duration, later bedtimes, and poorer sleep quality across survey years.

These findings are further supported by Silva et al. (2022), who in a systematic review of 23 studies reported consistent associations between increased screen time and adverse sleep outcomes in adolescents. Across the included studies, higher levels of screen exposure were associated with shorter sleep duration, delayed sleep onset, poorer sleep quality, and increased daytime sleepiness. The majority of studies demonstrated a negative relationship between screen use and sleep, despite variability in study design and measurement methods.

Taken together, these findings show consistent associations between increased screen time and multiple dimensions of sleep disturbance, including reduced sleep duration, impaired sleep quality, and prolonged sleep onset latency.

Discussion

The findings summarized in this narrative review indicate a consistent association between greater screen exposure and adverse sleep outcomes among adolescents. Across large population-based studies, cross-sectional surveys, and systematic reviews, increased screen time was associated with several dimensions of sleep disturbance, including shorter sleep duration, poorer subjective sleep quality, prolonged sleep onset latency, later bedtimes, and sleep deficiency (Hysing et al., 2015; Maurya et al., 2022; Naing et al., 2024; Otsuka et al., 2021; Silva et al., 2022). Although the included studies differed substantially in population, country, screen-time measurement, and sleep outcome definitions, the overall direction of association was generally consistent. These findings suggest that screen exposure should be interpreted as a heterogeneous behavioral exposure that may be linked to adolescent sleep through multiple pathways, including time displacement, psychophysiological arousal, light exposure, and broader lifestyle context (Alam et al., 2024; Fiore et al., 2025; Hysing et al., 2015; Otsuka et al., 2021; Silva et al., 2022).

A particularly important observation is that several studies reported graded associations between screen exposure and sleep outcomes (Hysing et al., 2015; Maurya et al., 2022; Otsuka et al., 2021). Hysing et al. (2015) showed that adolescents reporting more than 4 hours of daily leisure screen time had substantially increased odds of very short sleep duration, sleep deficiency, and prolonged sleep onset latency. Similarly, Otsuka et al. (2021) demonstrated that longer Internet use was associated with a stepwise increase in several sleep problems, including insomnia, later bedtime, shorter sleep duration, and poorer sleep quality, with the highest prevalence and odds observed among adolescents using the Internet for at least 5 hours per day. Maurya et al. (2022) also reported higher odds of sleep problems among adolescents using smartphones for more than 2 hours per day, while even smartphone use of 2 hours or less was associated with increased odds compared with non-use. Overall, these findings indicate that screen-related sleep problems are not restricted to the highest exposure categories, although the magnitude of association generally appears stronger at higher levels of screen use (Hysing et al., 2015; Maurya et al., 2022; Otsuka et al., 2021).

The results also suggest that associations between screen exposure and sleep may differ depending on the sleep domain being assessed. Hysing et al. (2015) showed that screen time was associated with sleep duration, sleep deficiency, and sleep onset latency, indicating that both sleep quantity and perceived sleep sufficiency may be affected. In Naing et al. (2024), screen exposure was analyzed in relation to global PSQI score, and weekend screen time remained the only screen-time variable independently associated with poorer sleep quality in the final multivariable model. This may indicate that the day-specific context of screen exposure is relevant, although the study does not establish why weekend use showed a stronger independent association. Otsuka et al. (2021) found that longer Internet screen time was associated with several sleep problems, with particularly pronounced associations for later bedtime and poorer sleep quality, while the association with shorter sleep duration was present but comparatively weaker. Collectively, this evidence suggests that screen exposure is related not only to reduced total sleep time, but also to delayed sleep timing, increased sleep latency, sleep deficiency, and poorer perceived sleep quality (Hysing et al., 2015; Naing et al., 2024; Otsuka et al., 2021).

The included evidence also suggests that demographic factors should be considered when interpreting the relationship between screen exposure and sleep. Maurya et al. (2022) reported sex-related differences in sleep problems among adolescents and young adults, with females generally showing a higher burden of sleep

problems than males; this pattern was also observed among adolescents with higher smartphone use. Naing et al. (2024) similarly found that female sex was associated with higher PSQI scores among adolescents in Brunei, while older adolescent age was also related to poorer sleep quality in their analyses. Otsuka et al. (2021) reported that female adolescents tended to have shorter sleep duration, later bedtimes, and poorer sleep quality across survey years, although the association between Internet screen time and sleep problems did not significantly differ by sex. Taken together, these findings suggest that sex and age should not be treated only as descriptive background variables, but may be relevant when interpreting vulnerability to sleep disturbance in the context of screen exposure (Maurya et al., 2022; Naing et al., 2024; Otsuka et al., 2021).

The available evidence comes from geographically diverse adolescent populations, suggesting that the association between screen exposure and sleep disturbances is not limited to a single country or cultural setting. Associations between screen exposure and adverse sleep outcomes were observed in studies from Norway, India, Brunei, and Japan, as well as in evidence summarized in systematic reviews (Hysing et al., 2015; Maurya et al., 2022; Naing et al., 2024; Otsuka et al., 2021; Silva et al., 2022). However, direct cross-country comparisons should be made cautiously, because the studies differed substantially in their definitions of screen exposure, sleep outcome measures, age ranges, and analytic approaches. For example, Hysing et al. (2015) assessed leisure screen time outside school hours, Maurya et al. (2022) focused on smartphone use during the previous 24 hours, Naing et al. (2024) used the Screen Time Questionnaire together with the Pittsburgh Sleep Quality Index, and Otsuka et al. (2021) examined Internet screen time categories across three repeated national surveys. Therefore, although the overall direction of findings appears consistent, direct comparison of effect sizes between studies remains limited by methodological heterogeneity (Hysing et al., 2015; Maurya et al., 2022; Naing et al., 2024; Otsuka et al., 2021; Silva et al., 2022).

The results should also be interpreted in relation to the type of screen activity, not only total duration. Maurya et al. (2022) focused on smartphone screen time, but their analysis did not primarily separate the effects of different content categories or modes of engagement. Therefore, evidence from studies examining specific screen-based activities is useful for interpreting whether all screen time should be treated as equivalent. Social media studies suggest that this may not be the case. Scott et al. (2019) reported associations between social media use and adverse sleep patterns in adolescents, while Hamilton et al. (2020) found that social media use predicted later sleep timing and greater variability in sleep timing and duration. In the Hamilton study, gaming and television did not show the same pattern, suggesting that social media may be particularly relevant for sleep timing and regularity rather than for all sleep outcomes equally (Hamilton et al., 2020). Additional support for activity-specific interpretation comes from Otsuka et al. (2021), who found that different types of Internet use showed different associations with sleep problems; social networking was strongly related to later bedtime, whereas online gaming was strongly related to later bedtime and poorer sleep quality. These findings indicate that the sleep-related impact of screen exposure may depend not only on total duration, but also on the specific activity performed, although current evidence does not justify a universal ranking of one screen activity as more harmful than all others across every sleep domain (Hamilton et al., 2020; Otsuka et al., 2021; Scott et al., 2019).

Gaming should therefore be interpreted as a potentially disruptive activity in a context-dependent manner rather than as uniformly more harmful than other screen activities. Weaver et al. (2010) examined presleep video-game playing in a small sample of male adolescents using an experimental within-subjects design and found that, compared with passive DVD watching, gaming before sleep slightly increased sleep-onset latency and reduced subjective sleepiness. The study also reported changes in cognitive alertness measured by EEG alpha power, but did not demonstrate increased physiological arousal measured by heart rate and did not find significant changes in REM sleep or slow-wave sleep (Weaver et al., 2010). These findings suggest that interactive gaming immediately before bedtime may influence sleep initiation, although the magnitude of this effect may be modest. This interpretation is consistent with broader mechanisms described in the literature, according to which screen-related sleep disruption may result not only from light exposure, but also from displacement of sleep time and cognitive or psychophysiological arousal (Fiore et al., 2025). Therefore, the impact of screen use on sleep is likely shaped by both duration and the behavioral characteristics of the activity, while the relative effects of social media, gaming, television, and other screen activities may differ between studies and sleep outcomes (Fiore et al., 2025; Hamilton et al., 2020; Weaver et al., 2010).

Timing of exposure is another important explanatory factor. Although the main focus of this review is overall screen time, the reviewed literature suggests that evening and night-time exposure may be particularly relevant for sleep disruption. Hartley et al. (2022) directly examined both duration and timing of screen use, distinguishing evening use from screen use after bedtime, and found that night-time screen use was consistently

associated with adverse sleep and daytime functioning outcomes. Mireku et al. (2019) similarly focused on screen-based media device use within one hour before sleep and reported associations with poorer sleep outcomes and lower health-related quality of life among adolescents. Evidence from Naing et al. (2024) adds a related but distinct temporal dimension, as weekend screen time, rather than weekday screen time, remained independently associated with higher PSQI scores after adjustment. This pattern indicates that screen exposure should not be interpreted only in terms of total duration. Studies that distinguish evening use, use after bedtime, night-time device use, and weekday–weekend patterns indicate that the timing and context of exposure may be relevant for adolescent sleep outcomes (Hartley et al., 2022; Mireku et al., 2019; Naing et al., 2024).

Environmental circumstances may further modify the association between screen use and sleep outcomes. Mireku et al. (2019) showed that night-time use of screen-based media devices, defined as use within one hour before sleep, was associated with poorer sleep outcomes and lower health-related quality of life among adolescents, and that the magnitude of these associations was stronger when devices were used in a dark room rather than in a lit room. This observation is biologically plausible in light of evidence that short-wavelength light can influence circadian regulation and melatonin secretion, although Mireku et al. did not directly measure circadian biomarkers (Alam et al., 2024; Mireku et al., 2019). Therefore, screen exposure should not be interpreted solely as total time with a device; its sleep-related relevance may also depend on proximity to bedtime, ambient lighting, and the broader context in which the device is used (Alam et al., 2024; Mireku et al., 2019). Such contextual differences may contribute to heterogeneity between studies and may help explain why total screen time alone does not fully capture the sleep-related impact of screen exposure (Mireku et al., 2019; Silva et al., 2022).

Several mechanisms may help explain the observed associations between screen exposure and sleep disturbances. First, short-wavelength light emitted by electronic screens may influence circadian regulation through melanopsin-sensitive retinal pathways and suppression of melatonin secretion. Alam et al. (2024) summarize evidence indicating that evening and night-time exposure to blue light from electronic devices can affect circadian timing, reduce melatonin secretion, and contribute to delayed sleep onset and impaired sleep quality. Höhn et al. (2024) provide experimental evidence from a within-subject study in male adolescents and young adults, in which polysomnography, melatonin secretion, subjective sleepiness, and memory-related sleep outcomes were assessed after evening reading on a smartphone with or without a blue-light filter or from a printed book. Smartphone exposure without a blue-light filter was associated with attenuation of melatonin secretion in both age groups immediately after reading; however, adolescents recovered before bedtime, whereas young adults still showed reduced melatonin levels at bedtime. At the same time, the study did not show broad impairment of sleep-dependent memory consolidation or consistent disruption of sleep architecture, suggesting that screen-related light exposure may have clearer effects on circadian hormonal markers than on all measured sleep parameters (Höhn et al., 2024).

Second, behavioral and psychological mechanisms may contribute to sleep disruption alongside light-related pathways. Screen use during evening or night-time hours may reduce the available sleep window and delay bedtime, particularly when use continues after the intended time for sleep (Fiore et al., 2025; Hartley et al., 2022; Mireku et al., 2019). In addition, some screen-based activities may be cognitively or socially engaging, which can make disengagement before sleep more difficult (Scott et al., 2019; Weaver et al., 2010). Social media use is especially relevant in this context because it involves ongoing social interaction and expectations of availability, which may contribute to delayed sleep timing and poorer sleep patterns (Hamilton et al., 2020; Scott et al., 2019). Presleep gaming should be interpreted more cautiously: Weaver et al. (2010) found that video-game playing before bedtime modestly increased sleep-onset latency and reduced subjective sleepiness, with evidence of increased cognitive alertness but not clear physiological arousal as measured by heart rate. Therefore, screen-related sleep disruption is best understood as multifactorial, involving light exposure, displacement of sleep time, cognitive engagement, and social or emotional stimulation rather than a single uniform mechanism (Alam et al., 2024; Fiore et al., 2025; Höhn et al., 2024; Scott et al., 2019; Weaver et al., 2010).

The consequences of screen-related sleep disturbance may extend beyond sleep itself. Mireku et al. (2019) reported that night-time screen-based media device use was associated not only with poorer sleep outcomes, but also with lower health-related quality of life among adolescents, particularly when mobile phones were used in darkness. Li et al. (2019) further showed that sleep characteristics, including insomnia symptoms and sleep duration, may mediate the association between adolescent screen-based activities and depressive symptoms. These findings suggest that the relevance of screen exposure is not limited to sleep

duration alone, but may also involve subjective sleep quality, daytime functioning, health-related quality of life, and psychological well-being (Li et al., 2019; Mireku et al., 2019).

This review also has limitations. As a narrative review, it does not provide a quantitative synthesis of effect sizes and does not apply the same level of methodological standardization as a systematic review or meta-analysis. The included studies differed substantially in exposure definitions, age ranges, outcome measures, and statistical adjustment. Therefore, the findings should be interpreted as an integrative synthesis of current evidence rather than as a pooled estimate of the effect of screen time on adolescent sleep.

Collectively, the available evidence suggests that the association between screen exposure and adolescent sleep is multifactorial and cannot be explained by total duration alone (Fiore et al., 2025; Silva et al., 2022). Dose, timing, type of activity, demographic characteristics, and environmental context all appear relevant (Hamilton et al., 2020; Hartley et al., 2022; Maurya et al., 2022; Mireku et al., 2019; Naing et al., 2024; Otsuka et al., 2021; Scott et al., 2019). However, because many included studies were observational and relied on self-reported measures, causal interpretation remains limited, and future research should use more objective sleep measures, longitudinal designs, and detailed assessment of screen content and timing (Fiore et al., 2025; Hamilton et al., 2020; Höhn et al., 2024; Silva et al., 2022).

Conclusions

In conclusion, current evidence indicates that greater screen exposure is consistently associated with poorer sleep outcomes among adolescents, particularly shorter sleep duration, poorer sleep quality, delayed sleep timing, prolonged sleep onset latency, and increased sleep difficulties. The relationship appears to be partly dose-related, with higher levels of exposure generally associated with more adverse sleep outcomes. However, the available evidence also suggests that screen time should not be interpreted only as a simple measure of total duration. Timing of use, type of screen activity, demographic factors, and environmental context may all influence the strength and character of the association.

Because much of the available evidence is observational and relies on self-reported screen exposure and sleep measures, causal interpretation remains limited. Nevertheless, the findings support the importance of considering screen exposure as a relevant behavioral factor in adolescent sleep health. Future studies should incorporate objective sleep measures, more detailed assessment of screen content and timing, and longitudinal or experimental designs to clarify which aspects of screen use are most strongly associated with sleep disruption and which adolescent subgroups are most vulnerable.

Author's contribution:

Conceptualisation: Krzysztof Sebastian Habirek

Methodology: Krzysztof Sebastian Habirek, Adrianna Krupska

Software: Krzysztof Sebastian Habirek, Anna Kropiwnicka

Check: Krzysztof Sebastian Habirek, Dominika Habirek, Anna Katarzyna Żurakowska- Zadrożna, Joanna Zuzanna Gugulska, Maja Maria Porążko

Formal analysis: Krzysztof Sebastian Habirek, Julia Anna Czarnecka, Michał Mieczysław Parus

Investigation: Krzysztof Sebastian Habirek, Michał Kieres

Resources: Krzysztof Sebastian Habirek, Zuzanna Marta Marcinkowska, Adrianna Krupska, Julia Anna Czarnecka, Klaudia Karolina Wójcik

Data curation: Krzysztof Sebastian Habirek, Klaudia Karolina Wójcik, Adrianna Krupska, Michał Mieczysław Parus, Aleksander Kacper Kierys

Writing –rough preparation: Krzysztof Sebastian Habirek, Michał Kieres, Maja Maria Porążko, Joanna Zuzanna Gugulska, Anna Kropiwnicka, Michał Mieczysław Parus

Writing –review and editing: Krzysztof Sebastian Habirek, Joanna Zuzanna Gugulska

Project administration: Krzysztof Sebastian Habirek

All authors have read and agreed with the published version of the manuscript.

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