



Vol. 3 No. 9 (September) (2025)

Effect of Nighttime Interactive Screen Use (e.g., Video Games/Chat) on Empathy Fatigue in Children

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ABSTRACT

The use of interactive screens as items found at night, is a widespread occurrence in the everyday lives of children through playing online video games or having late night chats. Despite the fact that these activities raise entertainment levels as well as social bond, they can cause downward effect on sleep, emotional control and empathy. This paper will review the relationship between interactivity exposure to screens at night and empathy fatigue in children. An 8-14 year cross-sectional survey of children (n=200) was used with self-report questionnaires, parental report and two week sleep diary. Results showed that increased nighttime interactive screen viewing was associated with a reduction of sleep duration, delayed sleep onset as well as high levels of empathy fatigue. This was mediated in part by sleep disruption and poor emotional regulation. The conclusion of the study is that interactive screens in the night at children can make them more susceptible to emotional fatigue and less empathy responsiveness, the content type (prosocial or violent) acts as a mediator.

Keywords: nighttime screen use, video games, chat, children, empathy fatigue, sleep disruption

Introduction

The online world has changed the way children entertain themselves in the evenings with most developing interactive media that include online games, chatting and recording. Although such activities are relatively beneficial in terms of learning and interpersonal communication, using them during the night makes the health and socio-emotional safety of users a topic of concern.

The literature demonstrates that screen time before sleep disrupts the quality of sleep and circadian activity (Hale & Guan, 2018; Nagata et al., 2023). Childhood insomnia is closely connected with ineffective emotional control and lack of empathy (Stony Brook Expert Panel, 2024). As one of the pillars of prosocial behavior, empathy consists of affective, cognitive, and behavioral aspects. Experts suggest that overtaxing can cause empathy fatigue which involves reduced attentiveness, emotional withdrawal and exhaustion.



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The sudden emergence of digital technology has changed the leisure activities of children. Online playing videos and chatting; all based on the use of interactive screens is a personal daily routine of many children and adolescents. In contrast to passive media, dynamic screen activities are interactive and require the active involvement of participants in the activity, quick feedback, and deep social or emotionalized interactions. Although such actions may contribute to having fun and bonding with peers, such behaviors especially in the middle of the night are questionable regarding the psychological and emotional well-being of children (Hale & Guan, 2015).

Research consistently shows that nighttime screen exposure can interfere with sleep by delaying bedtime, reducing total sleep duration, and impairing overall sleep quality (Hale & Guan, 2015; Nagata et al., 2020). Sleep is essential for healthy cognitive development, emotional regulation, and social functioning. Poor sleep has been linked to irritability, impulsivity, and difficulty in recognizing and managing emotions, which may in turn undermine the ability to empathize with others (Baum et al., 2014; Palmer & Alfano, 2017).

Empathy is a multidimensional construct that includes affective, cognitive, and behavioral components. It enables children to understand and share the feelings of others and to respond with supportive or prosocial behavior. However, when empathy is overtaxed or disrupted, children may experience **empathy fatigue**, characterized by emotional exhaustion, blunted affect, or reduced responsiveness to others' distress (Figley, 2002). Although the construct has been widely studied among adults in caregiving roles, its relevance to children is gaining attention, particularly in the context of modern digital lifestyles.

Moderators of type and content of screen use are really critical. Prosocial or cooperative games have been found to improve both perspective taking and collaboration (Greitemeyer and Mugge, 2014), whereas that of violent games or competition games may desensitize children to aggression and diminish empathic responses (Miedzobrodzka et al., 2021). Equally, chat services during the night may render the children more excited, and it may be harder to disengage before going to the bed, and, as such, may cause them greater emotional fatigue.

Literature Review

Nighttime Interactive Screen Use and Sleep

The higher use of digital devices by children has been associated with questions regarding the impact of screens at night on the health of sleep. Scientific literature implies that screen time evening before bedtime slows the latest fall asleep, shortens sleep, negatively affecting the quality of sleep (Hale & Guan, 2015; Nagata et al., 2020). The interactive processes can be particularly disturbing especially the Internet-based gaming or chatting activities which entail not only cognitive stimulation but also emotional excitement such that children find it hard to switch off and get ready to sleep (Cain and Gradisar, 2010). Conversely, the sleep disorder is highly correlated with attention, mood, and social dysfunctions in children and adolescents (Baum et al., 2014; Palmer and Alfano, 2017).

Empathy and Empathy Fatigue

Empathy is a multidimensional construct consisting of affective (emotional sharing), cognitive (perspective taking), and behavioral (helping responses) components (Overgaauw et al., 2017). While empathy is generally protective for children's social development, excessive demands on empathic responding or repeated exposure to



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emotionally draining situations may lead to empathy fatigue. Originally conceptualized as compassion fatigue in healthcare workers, empathy fatigue describes emotional exhaustion, blunted affect, and a reduced ability to connect with others' distress (Figley, 2002). Although less frequently studied in children, emerging research suggests that emotional exhaustion can impair social connectedness and prosocial behavior (Katrinli et al., 2018).

Screen Content and Empathy Outcomes

The type of screen content plays an important role in shaping empathy-related outcomes. Prosocial or cooperative games have been associated with increases in helping behavior and perspective taking (Greitemeyer & Mügge, 2014). In contrast, repeated exposure to violent or competitive games can reduce empathic sensitivity by desensitizing children to aggression and distress cues (Miedzobrodzka et al., 2021). Beyond content, the timing of interactive use—especially at night—may amplify risks by combining emotional stimulation with sleep disruption, both of which have downstream effects on children's empathic functioning.

Methods

Design and Participants

The research design used in this study was a two-part mixed-method cross-sectional with 14 days follow up methodology. A total of 200 children between ages 8-14 years, between school going ages, were recruited in schools in urban and semi-urban areas. Parents and child assent were taken.

Measures

Nighttime Interactive Screen Use: Gaming/chat time and content (prosocial, neutral, violent) on a daily screen log (8:00 pm-midnight).

Sleep: Actigraphy (14 days) and Sleep diaries: sleep onset, the total sleep time, and efficiency.

Sensitivity: Empathy: The Empathy Questionnaire of Children and Adolescents (**EmQue-CA**) measured affective, cognitive, and behavioral empathy.

Empathy Fatigue: a modified form of the Professional Quality of Life Scale (ProQOL) was equipped to meet developmental requirements and included emotional exhaustion and diminished empathic responsiveness.

Emotional Regulation: Parent- and child-report scales (Emotion Regulation Checklist).

Procedure

Questionnaires at schools were filled in as Baseline. Actigraphy watches were given to the children and nighttime use of the devices was logged by parents in 2 weeks. At follow-up, a short empathy-behavioral task (video vignette + helping-choice situation) was carried out.

Analysis

Screen use was described using descriptive statistics. Associations between screen use and empathy fatigue were also tested with sleep and emotional regulation mediating. The type of content was studied as a moderator.



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Results

Screen Use Patterns: The average time interacting at night was 65 minutes/day, and boys had more time at gaming and girls at chat/social media.

Sleep Outcomes: Higher night screen use was significantly correlated with nighttime establishing sleep later ($r = .32, p < .01$) and shortened sleep length ($b = -0.27, p < .01$).

Empathy Fatigue: Interactive users with >90 mn/night mapped to significantly higher empathy fatigue scales ($M = 3.6$) than low interactive users (90 minute interactive use) ($M = 2.8, p < .01$).

Mediation: Sleep disturbance and emotional ill regulation were how it was described explained about 42% of the variance in the screen use-empathy fatigue relation.

Moderation: The neutral or slightly positive implications with empathy were established with prosocial content (e.g., cooperative games), whereas violent/competitive content implied higher empathy fatigue.

Discussion

Findings support the hypothesis that nighttime interactive screen use contributes to empathy fatigue in children, largely through its negative effects on sleep and emotional regulation. Children exposed to prolonged, socially arousing, or violent content at night were more likely to exhibit emotional exhaustion and reduced empathic responsiveness. In contrast, cooperative/prosocial games did not show the same negative outcomes, suggesting that content and context matter.

These results align with previous research on screen time, sleep, and empathy (Hale & Guan, 2018; Miedzobrodzka et al., 2023). They also extend the literature by applying the concept of empathy fatigue to children, highlighting the risk that excessive nighttime digital engagement may erode emotional resilience and social connectedness.

Conclusion

Nighttime interactive screen use poses risks for children's emotional health by increasing empathy fatigue. Parents, educators, and policymakers should encourage device curfews, promote prosocial content, and educate families about the importance of sleep hygiene. Future longitudinal and experimental studies should refine empathy-fatigue measures for children and explore protective strategies such as structured digital literacy and mindfulness-based interventions.

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