



The Impact of Smart Device Use on Sleep Disorders Among Children and Adolescents

Ghadeer Hamid AL- Ardhi

DNA Research Center, University of Babylon, Babylon, Hillah, Iraq

Article Information

Received: 27-7-2026

Accepted: 18-8-2026

Published: 1-10-2026

Abstract

Background: The increase in the use of smart devices among children and adolescents is implicated in the emergence of multiple health-related disorders, especially sleep disorders and its psychological and hormonal consequences. **Aim:** This study aimed to assessment the effect of smart device on sleep disturbance for children and adolescents. **Methodology:** The data collected through a survey that included a questionnaire was administered to 200 samples, comprising a set of questions about the use of smart devices and their impact on sleep. **Results:** high percentage of participants (87.7%), (66.7%) respectively, used smart devices daily and immediately before bedtime. (50.9 %) reported difficulty initiating sleep, while (26.3%) reported no frequent nighttime awakenings, and (70.2%) reported change of mood. **Conclusion:** the unregulated using of smart devices contributes to sleep disorders and change of mood through the interaction of physiological and hormonal mechanisms, this need establishes preventive and awareness strategies.

keywords: Smart device, Sleep disorders, Children, Adolescents.

Introduction

In recent years the use of smart devices, especially among children and adolescents has increased, and become as essential part of daily routine which contributing in altered their daily life. The frequent use of these devices will affect the sleep pattern, hormonal balance, and overall health (Tremolada et al., 2025). Regular sleep is an essential factor for health growth, cognitive and neurodevelopment, and emotional regulation, therefore, chronic disorders give rise to negative effects extend to cognitive performance and psychological health (Swider-Cios et al., 2023). The recent evidence suggests that intensive use of these devices, especially in the evening, may disrupt the normal sleep rhythm, leading to difficulty falling sleep, shorter sleep duration, and reduced sleep quality (Clemente-Suárez et al., 2024).

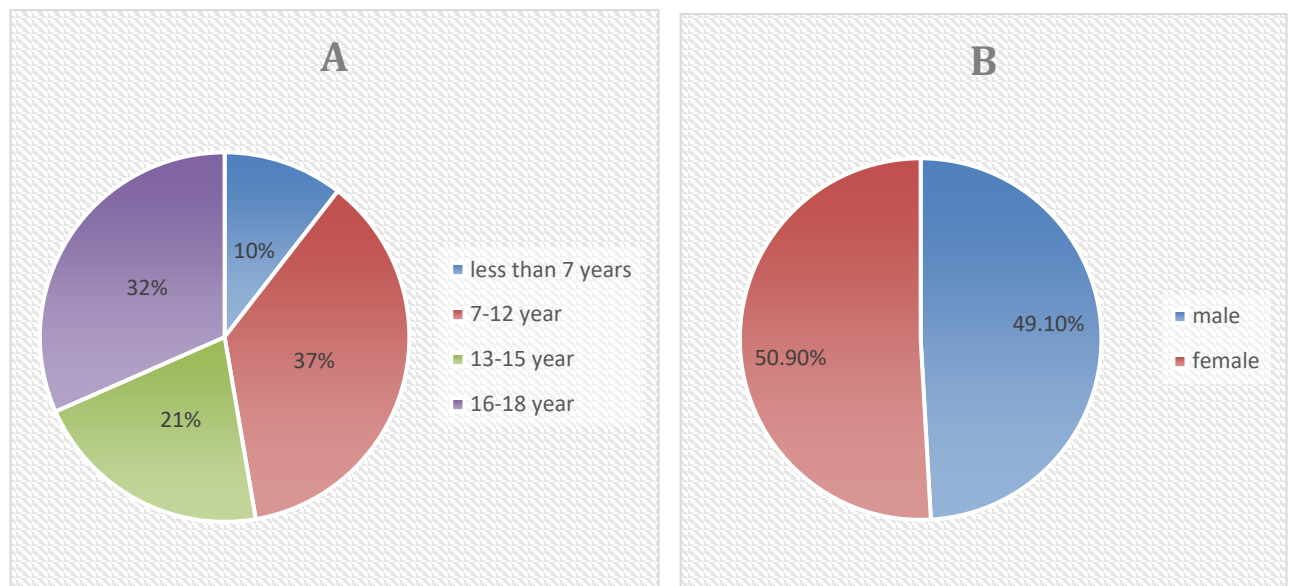
Psychologically, prolonged exposure to interactive digital contents is related to increased mental and emotional stimulation, contributing to higher levels of anxiety, stress, and mood disorders (Baddam et al., 2024). On the other hand, the blue light emitted from screens of smart devices effect the hormonal state,

the suppresses of melatonin production, the hormone responsible for regulating the circadian rhythm, and disrupted sleep can lead to increased cortisol levels, stress hormone (Tsouklidis et al., 2020).

The study aimed to assessment the relationship between excessive use of smart devices and sleep disorders among children and adolescent due to the importance of this age group and the sensitivity of its nervous and hormonal system.

Material and Methods

The online study included data collected were invited through personal communications to fill the online survey form of 200 Iraqi child and adolescent participants. The study was conducted between September 2025 and May 2026. The study instrument comprised questions designed to assessment the pattern of smart device use and its possible effects on sleep quality. ages of them assorted into groups involved: (less 7), (7-12), (13- 15), (16- 18) year, as showed in figure (1, A), and them gender showed in figure (1, B).



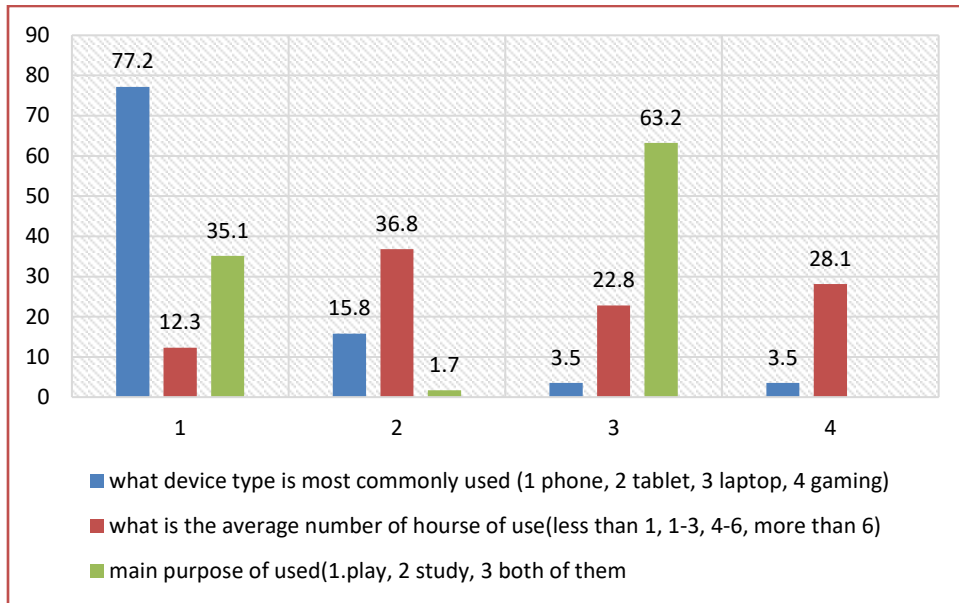


Figure 2: the percentage distribution of the study samples responses according to (device type, average of use, purpose of use) (N=200).

Figure 3 showed the results of questionnaire involved, the percentage of daily used of smart devices, devices used before sleeping, difficult night sleep, frequent awaking, changes in focus or mood, and if the trimming use is limited.

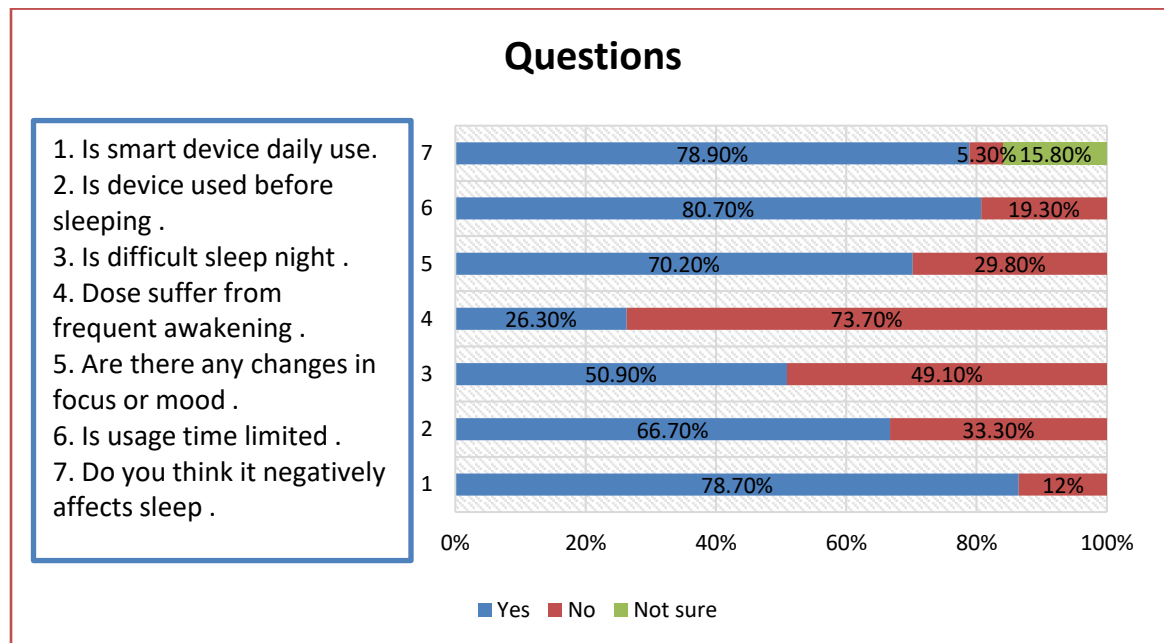


Figure 3: the percentage of the study samples responses to questionnaire axes (N=200).

The correlation of daily usage with difficult sleep, Frequent awaking, and Change in focus or mood were showed in table 1.

Table 1: Chi- square of daily usage correlation with (Difficult sleep, Frequent awaking, Change in focus or mood)

Variables	X ²	p- value
Difficult sleep	14.33	0.001

Frequent awakening	1.87	0.17
Change in focus or mood	8.96	0.003

- **P < 0.05**

Discussion

The results in figure 2 showed that smartphones the most dominant device usage compared to other devices types. This can be explained as the easy use of phone, easy carried and used anywhere and anytime, as well as its multiple functions that combine social communication, education, and entertainment all at once, which makes it the most preferred choice for family members. The smartphones have become an integral part of life (Parasuraman et al., 2017).

The results of average number of hours used showed the highest percentage was using smart devices about (1-3) hours per day, this reflecting relatively moderate to high usage level according to WHO guideline (WHO., 2019). However, the results also revealed a significant percentage of participants using smart devices more than 6 hours per day, this percentage higher than the recommended usage levels, leading to health, sleep, and psychological disorders. Over usage of smartphones has led to many deteriorating effects including poor sleep quality (Arshad et al., 2021).

Both of play and study is the greater percentage of the main purpose of smart devices used as showed in figure (2). This reflects the dual role of these devices in users lives.

The questionnaire results revealed that the majority of the samples (87.7%) using smart devices daily (figure 3). The high percentage of daily smart devices using is consistent with recent studies observed a significant increase in digital use rates in children and adolescents during the last decade. The increasing rates can be explained in the rapid expansion of digital infrastructure and the ease of access to smart devices, as well as the shift towards e- learning which led to reliance on these devices. Fatima *et al*, confirmed in their study that the growing issue of smart devices, mobile phone, addiction among children and adolescents, and its significant effect on sleep quality, which is becoming an integral part of daily life (Fatima et al., 2026). As well, Kumar *et al*, represented that the excessive use of smart devices has a negative significant relationship with sleep quality (Kumar et al., 2025). The excessive exposure to blue-wavelength light from these devices affect sleep by suppressing secretion of sleep hormone, melatonin as well as cause neurophysiologic effects (Schmid et al., 2021). Another study indicated that the high increase in screen usage rates has become a structural feature in the lives of adolescents, not just a passing phenomenon (Twenge et al., 2018).

The results also revealed about (66.7%) participants use smart devices immediately before bedtime, which is respected one of the most harmful behavioral patterns. Recent study demonstrated that using smart phone before going to bed, has been disrupt the quality of sleep by postponing the onset of sleep and shortening the duration of sleep (Leow et al., 2023). Blue light of screen reduces production of melatonin, a hormone responsible of controls of sleep cycles, which results in less restful sleep and daytime cognitive decline (He et al., 2020). Chang *et al*, demonstrated that studying evening on tablet took longer to get asleep and delays evening sleeping than studying by printed book, due to the exposure to short wavelength -enriched light emitted by these devices which suppresses melatonin and phase shift the biological clock (Chang et al., 2015).

The results of survey indicated that (50.9%) of the sample members suffering from difficulty in going to sleep evening and this result consistent with chi-square value (14.33) at ($p < 0.001$) in table.(1), it is remarkable that this percentage (50.9%) is lower than the rate of device use before bedtime (66.7%), and the (49.1%) of those who use device with not difficulty sleeping, this elucidate the differential susceptibility , the exposure to blue light or stimulant content does not make same effect in all individuals, (Chinoy et al., 2018). On the other hand, the existence of a highly statistically positive significant

relationship between daily usage of smart device and difficult sleep indicated that the longer use of smartphone addiction was significantly associated with deleterious effect on sleep (Sohn et al., 2021).

The results of this study showed a large percentage of participants doesn't suffer from frequent awakening and there was no significant differences ($p < 0.05$) of daily usage and frequent awakening as showed in (table 1), physiologically some researchers believe that the effect of blue light emitted from smart devices is mostly delay the sleep time, rather than a disruption of its internal structure or an increase in the number of awakenings (Hysing et al., 2015). While, another study suggesting that more use of smart devices is associated with shorter sleep duration and negative emotional symptoms (Nuutinen et al., 2014).

The habit of smart devices using until late time and before bedtime resulted in change of mood, the results showed large percentage of participants suffer from change in mood and focus with high significant correlation with daily and more usage (table 1). The excessive smart device use led to higher levels of stress and can cause depression (Zou et al., 2022).

Conclusion:

This study establishes a causal relationship between electronic smart devices use and sleep disturbances and change mood, with variations depending on timing, type, and duration use. These fundamental variables no less important than the overall time period, and these finding indicate the need to adopt integrated preventive proceedings involved both family and community.

References:

1. Arshad, D., Joyia, U. M., Fatima, S., Khalid, N., Rishi, A. I., Rahim, N. U. A., ... & Salmaan, A. (2021). The adverse impact of excessive smartphone screen-time on sleep quality among young adults: A prospective cohort. *Sleep Science*, 14(04), 337-341.
2. Baddam, S. K., Canapari, C. A., Van de Grift, J., McGirr, C., Nasser, A. Y., & Crowley, M. J. (2024). Screening and evaluation of sleep disturbances and sleep disorders in children and adolescents. *Psychiatric Clinics*, 47(1), 65-86.
3. Chang, A. M., Aeschbach, D., Duffy, J. F., & Czeisler, C. A. (2015). Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness. *Proceedings of the National Academy of Sciences*, 112(4), 1232-1237.
4. Chinoy, E. D., Duffy, J. F., & Czeisler, C. A. (2018). Unrestricted evening use of light-emitting tablet computers delays self-selected bedtime and disrupts circadian timing and alertness. *Physiological reports*, 6(10), e13692.
5. Clemente-Suárez, V. J., Beltrán-Velasco, A. I., Herrero-Roldán, S., Rodríguez-Besteiro, S., Martínez-Guardado, I., Martín-Rodríguez, A., & Tornero-Aguilera, J. F. (2024). Digital device usage and childhood cognitive development: Exploring effects on cognitive abilities. *Children*, 11(11), 1299.
6. Fatima, G., Shukla, V., Magomedova, A., & Magomedov, R. (2026). Mobile Phone Addiction and Sleep Quality Among Children and Adolescents: Unraveling the Health Consequences. *Cureus*, 18(1), e102460.
7. He, J. W., Tu, Z. H., Xiao, L., Su, T., & Tang, Y. X. (2020). Effect of restricting bedtime mobile phone use on sleep, arousal, mood, and working memory: A randomized pilot trial. *PloS one*, 15(2), e0228756.
8. Hysing, M., Pallesen, S., Stormark, K. M., Jakobsen, R., Lundervold, A. J., & Sivertsen, B. (2015). Sleep and use of electronic devices in adolescence: results from a large population-based study. *BMJ open*, 5(1), e006748.
9. Kumar, M., Katoch, O. R., Kumar, N., & Sehgal, S. (2025). Exploring the link between smartphone use and sleep quality: A systematic review. *Sleep Research*, 2(1), 42-56.

10. Leow, M. Q. H., Chiang, J., Chua, T. J. X., Wang, S., & Tan, N. C. (2023). The relationship between smartphone addiction and sleep among medical students: A systematic review and meta-analysis. *Plos one*, 18(9), e0290724.
11. Nuutinen, T., Roos, E., Ray, C., Villberg, J., Välimaa, R., Rasmussen, M., ... & Tynjälä, J. (2014). Computer use, sleep duration and health symptoms: a cross-sectional study of 15-year olds in three countries. *International journal of public health*, 59(4), 619-628.
12. Parasuraman, S., Sam, A. T., Yee, S. W. K., Chuon, B. L. C., & Ren, L. Y. (2017). Smartphone usage and increased risk of mobile phone addiction: A concurrent study. *International journal of pharmaceutical investigation*, 7(3), 125.
13. Schmid, S. R., Höhn, C., Bothe, K., Plamberger, C. P., Angerer, M., Pletzer, B., & Hoedlmoser, K. (2021). How smart is it to go to bed with the phone? The impact of short-wavelength light and affective states on sleep and circadian rhythms. *Clocks & Sleep*, 3(4), 558-580.
14. Sohn, S. Y., Krasnoff, L., Rees, P., Kalk, N. J., & Carter, B. (2021). The association between smartphone addiction and sleep: a UK cross-sectional study of young adults. *Frontiers in psychiatry*, 12, 629407.
15. Swider-Cios, E., Vermeij, A., & Sitskoorn, M. M. (2023). Young children and screen-based media: The impact on cognitive and socioemotional development and the importance of parental mediation. *Cognitive Development*, 66, 101319.
16. Tremolada, M., Incardona, R. M., Bonichini, S., & Taverna, L. (2025). Use of technological devices in children aged 3–11 years: Possible effects on sleep and behavioral difficulties. *Pediatric Reports*, 17(5), 99.
17. Tsouklidis, N., Tallaj, N., Tallaj, Y., & Heindl, S. E. (2020). Lights out! the body needs sleep: electronic devices and sleep deficiency. *Cureus*, 12(7).
18. Twenge, J. M., Martin, G. N., & Campbell, W. K. (2018). Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. *Emotion*, 18(6), 765.
19. World Health Organization. (2019). WHO guideline: recommendations on digital interventions for health system strengthening: web supplement 2: summary of findings and GRADE tables (No. WHO/RHR/19.7). World Health Organization.
20. Zou, L., Wu, X., Tao, S., Yang, Y., Zhang, Q., Hong, X., ... & Tao, F. (2022). Neural correlates of physical activity moderate the association between problematic mobile phone use and psychological symptoms. *Frontiers in Behavioral Neuroscience*, 15, 749194.