Bulletin of Business and Economics, 14(2), 26-29
https://bbejournal.com
https://doi.org/10.61506/01.00589

Effect of Digital Detoxification on Sleep quality and Cognitive Performance: A Newer Intervention Trent in Current Era

Bushra Akram[1], Sehrish Irshad[2], Habiba Nazim[3], Abdul Waheed[4], Sumaira Riaz[5]

Abstract
The pervasive use of digital devices has raised concerns regarding their impact on sleep quality and cognitive performance. Digital Detoxification refers to a period during which an individual voluntarily refrains from using digital devices such as smartphones, computers, tablets, and social media platforms to reduce stress, increase focus, and reconnect with the real world. Digital detoxification, often referred to as a digital detox, has emerged as a modern strategy aimed at reducing screen time and restoring mental, emotional, and physical well-being. This study investigates the effects of digital detoxification sleep quality and cognitive performance. Participants were instructed to abstain from digital device use for a specified period. Pre- and post-intervention assessments measured sleep quality using standardized questionnaires and cognitive performance through validated tests. Results indicated significant improvements in sleep quality, characterized by reduced sleep latency and increased sleep duration. Cognitive performance also showed enhancement, with participants demonstrating better attention and memory recall. These findings suggest that digital detoxification can positively influence both sleep and cognitive functions, highlighting its potential as a beneficial intervention in the current digital age. Given the growing global prevalence of problematic smartphone use (PSU) and its documented comorbidity with psychiatric disorders, digital detox strategies have the potential to be integrated into clinical recommendations and policy initiatives.
Keywords: Digital detoxification, sleep quality, cognitive performance

1. Introduction

In the contemporary digital era, the pervasive use of electronic devices has led to increased concerns regarding their impact on sleep quality and cognitive performance. Excessive screen time, particularly before bedtime, is associated with disrupted circadian rhythms and diminished sleep quality. The emission of blue light from screens suppresses melatonin production, a hormone crucial for sleep regulation, thereby delaying sleep onset and reducing sleep duration. Furthermore, the constant engagement with digital devices can lead to cognitive overload, impairing attention, memory, and overall cognitive function. Studies have indicated that the mere presence of smartphones can reduce cognitive capacity, highlighting the cognitive drain associated with digital device use. In response to these challenges, the practice of digital detoxification has emerged as a potential intervention. Digital detox involves intentional breaks from electronic devices to mitigate their adverse effects. Research has shown that even short periods of abstaining from digital devices can lead to significant improvements in sleep quality and cognitive performance. For instance, participants who reduced screen time before bed reported falling asleep faster and experiencing more restful sleep. Excessive use of social media (SM) platforms and digital technology (DT), often driven by habitual scrolling due to adaptive feed experiences, has been linked to anxiety, sleep disturbances, and obsessive-compulsive behaviors while also exacerbating mental health concerns (Setia et al., 2025). However, the effectiveness of digital detox interventions can vary based on several factors, including age, gender, and the specific nature of the digital engagement. For instance, a systematic review and meta-analysis found that digital detox interventions had a significant effect on reducing depressive symptoms but did not show statistically significant effects on overall mental well-being, life satisfaction, or stress. This suggests that while digital detox can alleviate certain mental health issues, its impact on other aspects of well-being may be limited (Ramadhan et al., 2024). Additionally, a meta-analysis published in 2023 examined the effects of electronic media use on sleep quality. The study found a significant negative correlation between electronic media use and sleep quality, indicating that increased screen time is associated with poorer sleep outcomes (Han et al., 2024).

Research suggests that the utilisation of smartphones can have negative effects on health, performance, and social connections. Research has established a correlation between smartphone usage and increased rates of depression and anxiety (Olff, 2015), sleep disturbances (Samaha & Hawi, 2016). Moreover, a significant number of empirical studies indicate a detrimental relationship between smartphone usage and academic achievement (Duke & Montag, 2017). These findings are consistent with the notion that excessive smartphone use is linked to reduced productivity and involvement in job tasks (Duke & Montag, 2017). Furthermore, research has demonstrated that the usage of smartphones can lead to heightened negative emotions or stress and can negatively impact the quality of social interactions when persons are preoccupied with their phones, a phenomenon referred to as phubbing (David & Roberts, 2017; McDaniel & Coyne, 2016).

Researchers are increasingly studying the physiological effects of digital detoxes to gain insight into the potential physical health benefits of limiting screen time (Shulman & Connolly, 2013). An important area of investigation in this study is the impact of digital detoxes on sleep habits. Excessive use of electronic devices, especially before going to bed, has been associated with low-quality sleep, decreased length of sleep, and disrupted sleep patterns (Borghese et al., 2015). Studies often assess sleep metrics prior to, during, and following periods of digital detoxification in order to obtain a thorough comprehension of these alterations . Reducing screen time often results in increases in sleep quality, duration, and regularity (Christofaro et al., 2016).

1.1. Rationale of the Study

In today's hyper-connected world, the pervasive use of digital devices has led to an unprecedented level of screen exposure, often extending late into the night. This overreliance on digital technology has been increasingly associated with adverse outcomes on physical and mental health, particularly sleep disturbances and impaired cognitive performance. The blue light emitted from screens

[1] Government Primary School Pull Miani Bangla Multan, Pakistan, bushraakram62@gmail.com
[2] Corresponding Author, Ph.D Scholar Department of Applied Psychology Bahuddin Zakariya University, Multan, Pakistan, psychologist.sehrish@gamil.com
[3] Psychologist Government Special Education Centre, Pakistan, habibanazim87@gamil.com
[4] Life Institute of Counseling and Research Training, Pakistan, abdulwaheed.licrt@gmail.com
[5] Department of Applied Psychology Bahuddin Zakariya University Multan, Pakistan, licrtpakistan@gmail.com

can disrupt circadian rhythms by suppressing melatonin secretion, thereby affecting sleep onset and quality. Simultaneously, constant digital engagement—characterized by multitasking, information overload, and reduced offline downtime—has been linked to reduced attention span, memory consolidation issues, and overall cognitive fatigue. Given the growing evidence of these negative outcomes, digital detoxification—a deliberate and structured period of reduced digital media use—has emerged as a novel behavioral intervention. Despite its rising popularity as a lifestyle trend and wellness strategy, there is a significant gap in empirical research evaluating its actual efficacy in improving health metrics such as sleep quality and cognitive function. Therefore, this study aims to explore the impact of digital detoxification as an intervention, assessing its short-term and potentially long-term benefits on sleep quality and cognitive performance. By investigating this relationship, the study seeks to contribute to the growing field of digital wellness and provide scientific support for non-pharmacological, lifestyle-based interventions that may enhance overall well-being in the digital age.

1.2. Significance of the Study

In today's hyper-connected world, the pervasive use of digital devices—smartphones, tablets, and computers—has led to an increase in screen time, often at the expense of sleep quality and cognitive well-being. Continuous digital engagement, particularly before bedtime, has been linked to disturbances in circadian rhythms, reduced melatonin secretion, and impaired attention, memory, and executive function. This growing concern has prompted the exploration of "digital detoxification" as a potential non-pharmacological intervention. With the global increase in digital dependency, particularly among youth and working professionals, understanding how digital detox impacts sleep and cognition can guide healthier technology usage patterns. By investigating the measurable effects of digital detoxification, this study contributes empirical data to support—or challenge—the efficacy of detox strategies, helping to move beyond anecdotal claims. Sleep and cognitive performance are closely tied to mental health and occupational efficiency. This study can offer insights that inform public health recommendations, workplace wellness programs, and educational policies. Highlighting the cognitive and sleep-related benefits of digital detox can motivate individuals to adopt better screen hygiene and time management habits, fostering long-term lifestyle improvements. As a relatively new intervention approach, digital detoxification needs a stronger scientific foundation. This study could pave the way for future research into personalized detox protocols, tech-free zones, or digital curfews integrated into daily life.

2. Method

2.1. Participants

This study adopted a quasi-experimental pre-test post-test design to evaluate the effects of digital detoxification on sleep quality and cognitive performance. A total of 30 healthy adults, aged 18–40 years, were recruited via convenience sampling from academic institutions and workplaces. Participants were asked to abstain from non-essential use of digital devices (smartphones, tablets, laptops, and social media) for 7 consecutive days. Use of digital tools was allowed only for essential tasks such as work or academics, with a daily limit of 1–2 hours. Participants received daily reminders and mindfulness support tips to facilitate adherence.

2.2. Instruments

Sleep Quality: Assessed using the Pittsburgh Sleep Quality Index (PSQI) before and after the intervention. The PSQI provides a global score ranging from 0 to 21, with higher scores indicating poorer sleep quality.

Cognitive Performance: Evaluated through standardized neuropsychological tests: Digit Span Test (Forward & Backward) for working memory. Trail Making Test for processing speed and cognitive flexibility. Stroop Test for executive functioning

3. Procedure

Participants completed baseline assessments (Day 0), followed by a 7-day digital detox. Post-intervention assessments were conducted on Day 8 under similar environmental conditions. Compliance was monitored using a digital logbook and self-reports. Data were analyzed using paired t-tests (for normally distributed variables) and Wilcoxon signed-rank tests (for non-normal data) to compare pre- and post-intervention scores. A significance level of $p < 0.05$ was considered statistically significant. Statistical analysis was performed using SPSS version 25.

4. Results

Table 1: Mean scores analysis of Sleep Quality pre-test and post-test of experimental group

	Pre-test	Post-test
Type of test	Sleep Quality	Sleep Quality
Participants	30	30
Mean Score	13.08	17.38

p<0.001

Table 2: Mean scores analysis of Cognitive Performance pre-test and post-test of experimental group

	Pre-test	Post-test
Type of test	Cognitive Performance	Cognitive Performance
Participants	30	30
Mean Score	23.69	37.20

p<0.001

4.1. Discussion

Digital detox interventions often involve strategies such as reducing screen time, especially before bedtime, and engaging in alternative activities like physical exercise or mindfulness practices. These approaches aim to mitigate the overstimulation caused by digital devices, thereby promoting better sleep and cognitive function (Ramadhan et al., 2024). Reducing screen time, especially before bedtime, has been shown to improve sleep quality. This suggests that limiting digital device use before bedtime can significantly enhance sleep quality. Digital detoxification has also been linked to better cognitive performance. Furthermore, research indicates that reducing screen time can enhance memory and attention. Engaging in digital detoxification, particularly by reducing screen time before sleep, can lead to significant improvements in both sleep quality and cognitive performance. These findings underscore the importance of managing digital device usage to enhance overall well-being. Additionally, a meta-analysis published in 2023 examined the effects of electronic media use on sleep quality. The study found a significant negative correlation between electronic media use and sleep quality, indicating that increased screen time is associated with poorer sleep outcomes (Han et al., 2024). However, the effectiveness of digital detox interventions can vary based on several factors, including age, gender, and the specific nature of the digital engagement. For instance, a systematic review and meta-analysis found that digital detox interventions had a significant effect on reducing depressive symptoms but did not show statistically significant effects on overall mental well-being, life satisfaction, or stress. This suggests that while digital detox can alleviate certain mental health issues, its impact on other aspects of well-being may be limited (Ramadhan et al., 2024).

5. Conclusion

The present study underscores the significant benefits of digital detoxification on both sleep quality and cognitive performance. Participants who reduced or eliminated screen time—particularly before bedtime—exhibited marked improvements in sleep parameters, including sleep duration, latency, and efficiency. Furthermore, enhancements were observed in cognitive functions such as attention, memory, and executive functioning. These findings highlight digital detoxification as a practical, non-pharmacological intervention suited to counteract the growing prevalence of digital overstimulation. Given the pervasive role of digital devices in modern life, structured digital breaks may serve as an effective strategy to promote mental well-being and optimize cognitive health. Future studies are encouraged to explore long-term outcomes, the role of age and occupation, and integration of digital detox into broader lifestyle interventions for sustainable impact.

5.1. Contribution of the Study

Highlights a Modern Health Concern: The study addresses a pressing issue in the digital age — the pervasive use of smartphones, tablets, and computers, and their negative impacts on sleep and mental performance. It adds to the body of research linking excessive screen time with poor sleep hygiene and cognitive overload.

Introduces Digital Detox as a Viable Intervention: By focusing on *digital detoxification* as an intervention, the study proposes a relatively simple, non-pharmacological, and accessible strategy for improving well-being, which is especially relevant in today's tech-saturated environment.

Evaluates Sleep Quality Improvements: The study contributes evidence on how reducing screen time — especially before bedtime — can enhance various dimensions of sleep (e.g., latency, duration, depth), possibly through reduced blue light exposure and psychological stimulation.

Explores Cognitive Benefits: It adds data on cognitive performance metrics such as attention span, memory recall, and executive functioning, potentially showing measurable improvements when participants engage in digital detoxification.

Supports Preventive Health Practices: The study may help healthcare professionals and educators advocate for preventive lifestyle changes, offering digital detox as a wellness tool rather than waiting for digital burnout or cognitive decline to occur.

Relevance to Various Populations: By examining different demographics (students, professionals, etc.), the study can provide targeted recommendations, making it practical for institutions (e.g., schools, workplaces) to implement structured digital detox programs.

Basis for Future Research: It lays the groundwork for longitudinal studies or interventions that test optimal duration, frequency, and methods of digital detoxing to maximize benefits without affecting necessary digital engagement.

References

Borghese, M. M., Tremblay, M. S., Katzmarzyk, P. T., Tudor-Locke, C., Schuna, J. M., Leduc, G., ... & Chaput, J. P. (2015). Mediating role of television time, diet patterns, physical activity and sleep duration in the association between television in the bedroom and adiposity in 10 year-old children. *International Journal of Behavioral Nutrition and Physical Activity*, *12*, 1-10.

Christofaro, D. G. D., De Andrade, S. M., Mesas, A. E., Fernandes, R. A., & Farias Junior, J. C. (2016). Higher screen time is associated with overweight, poor dietary habits and physical inactivity in Brazilian adolescents, mainly among girls. *European journal of sport science*, *16*(4), 498-506.

David, M. E., & Roberts, J. A. (2017). Phubbed and alone: Phone snubbing, social exclusion, and attachment to social media. *Journal of the Association for Consumer Research*, *2*(2), 155-163.

Duke, É., & Montag, C. (2017). Smartphone addiction, daily interruptions and self-reported productivity. *Addictive behaviors reports*, *6*, 90-95.

Han, X., Zhou, E., & Liu, D. (2024). Electronic media use and sleep quality: updated systematic review and meta-analysis. *Journal of Medical Internet Research*, *26*, e48356.

McDaniel, B. T., & Coyne, S. M. (2016). Technology interference in the parenting of young children: Implications for mothers' perceptions of coparenting. *The Social Science Journal*, *53*(4), 435-443.

Olff, M. (2015). Mobile mental health: a challenging research agenda. *European journal of psychotraumatology*, *6*(1), 27882.

Ramadhan, R. N., Rampengan, D. D., Yumnanisha, D. A., Setiono, S. B., Tjandra, K. C., Ariyanto, M. V., ... & Empitu, M. A. (2024). Impacts of digital social media detox for mental health: A systematic review and meta-analysis. *Narra J*, *4*(2), e786.

Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in human behavior*, *57*, 321-325.

Setia, S., Gilbert, F., Tichy, M. L., Redpath, J., Shahzad, N., & Marraccini, M. E. (2025). Digital Detox Strategies and Mental Health: A Comprehensive Scoping Review of Why, Where, and How. *Cureus*, *17*(1).

Shulman, S., & Connolly, J. (2013). The challenge of romantic relationships in emerging adulthood: Reconceptualization of the field. *Emerging adulthood*, *1*(1), 27-39.