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Review Article

A Review on Pharmacological Therapy on Screentime

Sudarsanam Nagarjuna[1*], Dr. B. Thangabalan[2], S. Uma Maheswari Bai[3], K. Sravani[4], K. Pravallika[5], M. Beula[6], J. Dwaraka[7], S. K. Naziya[8], L. Dibiya Devi[9], S. Mohan[10]

[1] *Assistant proffesor SIMS college of pharmacy.*
[2] *principal SIMS college of pharmacy.*
[3,4,5,6,7,8,9,10] *student SIMS college of pharmacy.*

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ABSTRACT

Screen time has become an essential part of daily life, especially among children, adolescents, and young adults, for education, communication, work, and entertainment. However, excessive and prolonged use of smartphones, computers, tablets, and televisions can negatively affect physical and mental health. Common problems include digital eye strain, dry eyes, blurred vision, headaches, neck and shoulder pain, poor posture, reduced physical activity, sleep disturbances, stress, and reduced concentration. Blue-light exposure at night may suppress melatonin production and disturb the sleep–wake cycle, while reduced blinking during prolonged screen use can increase ocular dryness and discomfort. This review discusses the causes, risk factors, molecular mechanisms, epidemiology, effects, and management of excessive screen time. Pharmacological treatment mainly provides symptomatic relief, while preventive measures such as regular breaks, the 20-20-20 rule, adequate sleep, exercise, proper posture, and reducing unnecessary screen use are important for maintaining overall health.

INTRODUCTION:

Excessive screen time causes direct harm to both the brain and the body. Digital screens emit a high-energy blue light that disrupts our internal biological clock. When we use devices at night, this light stops the brain from releasing melatonin, a natural hormone that controls sleep. This causes severe insomnia, daytime fatigue, and lack of focus, which often forces people to rely on sleeping pills. Furthermore, staring at screens reduces our natural blinking rate by more than half, causing the tear film on our eyes to dry up quickly. This leads to Digital Eye Strain (DES), characterized by burning eyes, blurred vision, and chronic headaches.

Regarding the types of radiate on, digital screens primarily emit Optical Radiation, which includes visible

***Corresponding Author:** Sudarsanam Nagarjuna
Address: Assistant proffesor SIMS college of pharmacy
Email ✉: umabaisapavathu@gmail.com
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light, infrared light, and High-Energy Visible (HEV) blue light. Blue light has the shortest wavelength and the highest energy in the visible spectrum, allowing it to penetrate deep into the eye and stress the retina. Modern screens (like LCD and OLED found in smartphones and laptops) use safe, low voltages, meaning they do not emit dangerous, ionizing radiation like X-rays or nuclear radiation. However, they do generate weak Electromagnetic Fields (EMF) and Radiofrequency (RF) radiation from their internal wireless components and electrical circuits, though blue light remains the main culprit for health issues**.**

Epidemiological data reveals that excessive digital screen time has become a major global health concern, with the worldwide average reaching 6 hours and 38 minutes per day per adult. This means people are spending over 40% of their waking hours interacting with digital devices. However, this data varies dramatically by region; South Africa leads the world with the highest average of 9 hours and 24 minutes of daily screen time, followed closely by Brazil at over 9 hours. Conversely, Japan records the lowest digital device usage in the world, averaging just around 4 hours per day. This massive global dependency on electronic screens has accelerated the widespread prevalence of clinical conditions like chronic sleep disorders and digital eye strain across different demographics

year	Screen use	Approx.use	Common effects
2020	Increased due to covid19	4.5 billion	Eye strain, stess,poor sleep
2021	Remained high	4.9 billion	Eye problem
2022	Continued high	5.0 billion	Neck pain
2023	Incresed further	5.3 billion	Eye strain ,poor sleep
2024	Very high worldwide	5.5 billion	inactivity
2025	Continued increasing	5.8 billion	Poor sleep
2026	Still increasing	6 billion	Sleep problem

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Epidemiology of Screen Time in IndiaIn India, screen time has become a serious public health issue, with young adults averaging between 4 and 7 hours of screen time daily. India ranks among the highest countries globally for smartphone dependency, with over 98% of college students using phones heavily for social media, gaming, and online classes. Local clinical studies show that over 70% of Indian youth exceed healthy screen limits. This excessive usage has led to a major rise in health complaints across the country, particularly Digital Eye Strain (DES), severe headaches, and chronic sleep problems.

Hartstein et al. (2023) Associations Between Digital Screen Exposure and Sleep Disturbances Among School-Aged Demographic .The researchers proved that late-night screen light suppresses the natural secretion of melatonin by up to 99% in sensitive individuals. The study concluded that interactive smartphone usage within one hour of bedtime acts as the strongest independent predictor of severe insomnia, waking fatigue, and phase-shifting of the circadian clock.

Patel et al. (2024) Changes in Blink Rate, Reading Performance, and Ocular Discomfort During Digital Reading. This clinical trial compared traditional print reading against electronic screens. The authors concluded that digital reading causes a person's natural blink rate to drop by over 50% (falling from roughly 18 blinks down to just 3.6 blinks per minute). This massive drop directly accelerates tear film evaporation, concluding that digital screens are the primary trigger for chronic dry eyes, eye burning, and blurred vision.

Saburnet et al. (2025) Digital Eye Strain and Smartphone Engagement: An Integrative Review from Ocular Surface to Neurophysiolo. This study evaluated the long-term lifestyle effects of digital device reliance. The researchers concluded that high device usage significantly increases cognitive stress and brain fatigue. Because of these chronic symptoms, there is a documented global surge in self-medication, forcing young patients to rely heavily on Over-The-Counter (OTC) sleeping aids and lubricating artificial tear eye drops to manage daily exhaustion.

OBJECTIVES

The main objective of this review is to understand the effects of excessive screen time on human health. It aims to study how prolonged use of mobile phones, computers, televisions, and other digital devices affects the eyes, sleep, physical activity, concentration, and mental well-being. It also focuses on identifying the major risk factors associated with excessive screen use and understanding its basic molecular mechanism. In addition, the review aims to discuss current pharmacological and herbal approaches that may help manage screen-time-related problems and promote healthy screen-use habits

MOLECULAR MECHANISM:

When a person watches a mobile, computer, or TV screen for a long time, the eyes are continuously exposed to light, especially blue light. This stimulates the retina and sends signals to the brain. At night, this light can reduce the production of melatonin, a hormone that helps us sleep. As a result, sleep may become delayed or disturbed. Long periods of screen use can also cause less blinking, which makes the eye dry and tired. Continuous visual stimulation and eye strain may increase oxidative stress, which means an imbalance between harmful free radicals and the body's protective antioxidants. This can contribute to eye irritation, tiredness, headache, and discomforts.

Simple pathway:

Long screen exposure → retinal stimulation → brain signaling → ↓ melatonin → disturbed sleep + eye strain → oxidative stress → fatigue and discomfort.

RISK FACTORS:

Excessive screen time is associated with several behavioural and lifestyle risk factors. Frequent use of smartphones, social media, online gaming, and video streaming can make people lose track of time and spend longer periods on screens than intended. Continuous screen use may cause trouble focusing, reduced attention, and difficulty concentrating on studies or work. Using electronic devices late at night can contribute to sleep problems, such as delayed sleep and poor sleep quality. A sedentary lifestyle, lack of outdoor activities, and inadequate screen-time limits can further increase exposure. Poor posture, close viewing distance, and lack of regular breaks may also increase eye strain, headaches, and neck or shoulder discomfort.

CURRENT PHARMACOLOGICAL TREAMENT:

There is no specific pharmacological drug for excessive screen time. Treatment primarily focuses on relieving associated digital eye-strain symptoms. Artificial tears and lubricating ophthalmic preparations are commonly used to manage screen-associated dry eye, burning, irritation and ocular discomfort. Preservative-free lubricants may be preferred when frequent application is required. In patients with clinically significant inflammatory dry eye, ophthalmologists may consider prescription anti-inflammatory agents such as cyclosporine or lifitegrast. Correction of refractive errors is also important. However, pharmacological treatment should be combined with non-pharmacological measures such as reducing screen exposure, frequent blinking and regular breaks.

There is no specific medicine that can completely stop excessive screen-time use. The main treatment is to reduce phone or screen use and develop healthy habits. Some herbs such as bilberry, Brahmi, Ashwagandha, turmeric, and chamomile may help with eye tiredness, stress, relaxation, and sleep problems. For symptoms like dry or tired eyes, lubricating eye drops may provide relief. Simple medicines may also be used for headaches or other symptoms when advised by a doctor. Herbal products and medicines should not be taken together without medical advice because they may interact with each other. Taking regular screen breaks, getting enough sleep, exercising, and reducing screen use are the most important steps.

DISCUSSION:

Excessive screen time can affect the eyes, brain, and sleep. Continuous screen use reduces blinking and can cause dry eyes, eye strain, headache, and blurred vision. At the cellular level, prolonged exposure may increase oxidative stress and inflammation, which can contribute to discomfort and fatigue.

Using mobile phones or other screens at night can disturb the normal release of melatonin, the hormone

that helps control sleep. This may disturb the sleep–wake cycle and cause difficulty falling asleep, poor sleep quality, tiredness, and difficulty focusing the next day. Excessive screen use may also increase mental stress and reduce concentration

There is no specific drug that directly treats excessive screen-time use. Current treatment mainly manages the symptoms, such as lubricating eye drops for dry eyes and suitable medicines for headache or sleep problems when prescribed by a healthcare professional. Along with treatment, reducing screen time, taking regular breaks, following the 20-20-20 rule, exercising, and avoiding screens before bedtime are important for better recovery.

CONCLUSION:

Screen time is an important part of our daily life, especially for studying, working, communication, and entertainment. However, spending too much time on screens can cause eye strain, headaches, poor sleep, tiredness, lack of concentration, stress, and less physical activity. Continuous screen use may also affect our daily routine and social interactions.

We should not completely avoid screens, but we should use them wisely and take regular breaks. Following the 20-20-20 rule, getting enough sleep, exercising regularly, and reducing unnecessary phone use can help. Spending more time on outdoor activities and with family and friends is also beneficial. Overall, balanced screen use is important for maintaining good physical health, mental well-being, and a healthy lifestyle.

REFERENCES

1. 1)Hale L, et al. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. Sleep Medicine Reviews, 21. DOI: 10.1016/j.smrv.2014.07.007.
2. Mehra D, et al. (2020). Digital Screen Use and Dry Eye: A Review. Asia-Pacific Journlof Ophthalmology, 9 DOI: 10.1097/APO.0000000000000328.
3. 3)Silva SS, et al. (2022). Use of digital screens by adolescents and association on sleep quality: A systematic review. Cadernos de Saúde Pública, 38 (10). DOI: 10.1590/0102-311XEN300721.
4. 4)Tang S, et al. (2021). The relationship between screen time and mental health in young people: A systematic review of longitudinal studies. Clinical Psychology Review, 86. DOI: 10.1016/j.cpr.2021.102021.
5. 5)Bourke M, et al. (2026). Within-Person Association Between Daily Screen Use and Sleep in Youth. JAMA Pediatrics, 180 (5). DOI: 10.1001/jamapediatrics.2025.6490.
6. Dibben GO, et al. (2023). Adolescents' interactive electronic device use, sleep and mental health: A systematic review of prospective studies. Journal of Sleep Research, 32 (5). DOI: 10.1111/jsr.13899.
7. 7)Fang K, et al. (2019). Screen time and childhood overweight/obesity: A systematic review and meta-analysis. Child: Care, Health and Development, 45 (5). DOI: 10.1111/cch.12701
8. 8)Chen YJ, et al. (2025). Association of smartphone overuse and neck pain: A systematic review and meta-analysis. Postgraduate Medical Journal, 101 (1197). DOI: 10.1093/postmj/qgae200.
9. 9)Kaur K, et al. (2022). Digital Eye Strain—A Comprehensive Review. International Ophthalmology, 11 (5). DOI: 10.1007/s40123-022-00540-9.
10. 10)Mataftsi A, et al. (2023). Digital eye strain in young screen users: A systematic review. Preventive Medicine, 170. DOI: 10.1016/j.ypmed.2023.107493.
11. 11)Blehm C, et al. (2005). Computer vision syndrome: A review. Survey of Ophthalmology, 50 (3). DOI: 10.1016/j.survophthal.2005.02.008.
12. 12)Rehan ST, et al. (2022). Computer Vision Syndrome: An Unnoticed Prevailing Scourge to Radiologists. Academic Radiology, 29 (1). DOI: 10.1016/j.acra.2021.09.027.
13. 13)Munshi S, et al. (2017). Computer vision syndrome—A common cause of unexplained visual symptoms in the modern era. International Journal of Clinical Practice, 71 (7). DOI: 10.1111/ijcp.12962.
14. 14)Alamri A, et al. (2022). Computer vision syndrome: Symptoms, risk factors, and practices.

Journal of Family Medicine and Primary Care, 11 (9). DOI: 10.4103/jfmpc.jfmpc_1627_21.

15. 15)Moore PA, et al. (2024). Digital eye strain and its impact on working adults in the UK and Ireland. Contact Lens and Anterior Eye, 47 (6). DOI: 10.1016/j.clae.2024.102176.
16. 16)Ccami-Bernal F, et al. (2024). Prevalence of computer vision syndrome: A systematic review and meta-analysis. Journal of Optometry, 17 (1). DOI: 10.1016/j.optom.2023.100482.
17. 17)Zhang P, et al. (2022). Effect of screen time intervention on obesity among children and adolescent: A meta-analysis of randomized controlled studies. Preventive Medicine, 157. DOI: 10.1016/j.ypmed.2022.107014.
18. 18)Eitivipart AC, et al. (2018). Musculoskeletal disorder and pain associated with smartphone use: A systematic review of biomechanical evidence. Hong Kong Physiotherapy Journal, 38 (2). DOI: 10.1142/S1013702518300010.
19. 19)Maayah MF, et al. (2023). Neck pain associated with smartphone usage among university students. PLOS ONE, 18 (6). DOI: 10.1371/journal.pone.0285451.
20. 20)Sharma A, et al. (2023). Determinants of digital eye strain among university students in a district of India. Journal of Public Health, 31? DOI: 10.1007/s10389-023-01924-2.
21. 21)Elvan A, et al. (2024). The association between mobile phone usage duration, neck muscle endurance, and neck pain among university students. Scientific Reports, 14 (1). DOI: 10.1038/s41598-024-71153-4.
22. 22)Wu Y, et al. (2022). Screen Time and Body Mass Index Among Children and Adolescents: A Systematic Review and Meta-Analysis. Frontiers in Pediatrics, 10. DOI: 10.3389/fped.2022.822108.
23. 23)Ikeda I, et al. (2024). Association between screen time, including that for smartphones, and overweight/obesity among children in Japan. Endocrine Journal, 71 (2). DOI: 10.1507/endocrj.EJ23-0343.
24. 24)Xu H, et al. (2015). Associations of parental influences with physical activity and screen time among young children: A systematic review. Journal of Obesity, 2015. DOI: 10.1155/2015/546925.
25. 25)Oh C, et al. (2022). Interventions to Promote Physical Activity and Healthy Digital Media Use in Children and Adolescents: A Systematic Review. Pediatrics, 149 (Suppl 5). DOI: 10.1542/peds.2021-053852I.
26. 26)Zhong C, et al. (2025). Electronic Screen Use and Sleep Duration and Timing in Adults. JAMA Network Open, 8 (3). DOI: 10.100 Shechter 1/jamanetworkopen.2025.2493.
27. A, et al. (2018). Blocking nocturnal blue light for insomnia: A randomized controlled trial. Journal of Psychiatric Research, 96. DOI: 10.1016/j.jpsychires.2017.10.015.
28. 28)Burkhart K, et al. (2009). Amber lenses to block blue light and improve sleep: A randomized trial. Chronobiology International, 26 (8). DOI: 10.3109/07420520903523719.
29. 29)Rathakrishnan B, et al. (2021). Smartphone Addiction and Sleep Quality on Academic Performance of University Students. International Journal of Environmental Research and Public Health, 18 (16). DOI: 10.3390/ijerph18168291.
30. 30)Zhang MX, et al. (2020). Effects of smartphone addiction on sleep quality among Chinese university students. Addictive Behaviors, 111. DOI: 10.1016/j.addbeh.2020.106552.
31. 31)Chatterjee S, et al. (2021). Smartphone Addiction and Quality of Sleep among Indian Medical Students. Psychiatry, 84 (2). DOI: 10.1080/00332747.2021.1907870.
32. Kalal N, et al. (2023). Smartphone addiction and its impact on quality of sleep and academic performance among nursing students in Western Rajasthan, India. Investigación y Educación en Enfermería, 41 (2). DOI: 10.17533/udea.iee.v41n2e11.
33. 33)Zhu W, et al. (2024). Influence of smartphone addiction on sleep quality of college students: The regulatory effect of physical exercise behavior.

PLOS ONE, 19 (7). DOI: 10.1371/journal.pone.0307162.

34. 34)Li Y, et al. (2020). Correlations between mobile phone addiction and anxiety, depression, impulsivity, and poor sleep quality among college students. Journal of Behavioral Addictions, 9 (3). DOI: 10.1556/2006.2020.00057.
35. 35)Yang J, et al. (2020). Association of problematic smartphone use with poor sleep quality, depression, and anxiety: A systematic review and meta-analysis. Psychiatry Research, 284. DOI: 10.1016/j.psychres.2019.112686.
36. 36)Elhai JD, et al. (2017). Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. Journal of Affective Disorders, 207. DOI: 10.1016/j.jad.2016.08.030.
37. 37)Lund J, et al. (2022). Headache in Children and Adolescents: The Association between Screen Time and Headache. Neuropediatrics, 53 (4). DOI: 10.1055/s-0041-1740550.
38. 38)Gastaud LM, et al. (2023). Screen time: Implications for early childhood cognitive development. Early Human Development, 183. DOI: 10.1016/j.earlhumdev.2023.105792.
39. 39)Sarraf F, et al. (2022). Comparing the effect of the posture of using smartphones on head and neck angles among college students. Ergonomics, 65 (12). DOI: 10.1080/00140139.2022.2047229.
40. 40)Szeto GPY, et al. (2020). A field study on spinal postures and postural variations during smartphone use among university students. Applied Ergonomics, 88. DOI: 10.1016/j.apergo.2020.103183.
41. 41)Sirajudeen MS, et al. (2022). Prevalence of text neck posture, smartphone addiction, and its association with neck disorders among university students. PeerJ, 10. DOI: 10.7717/peerj.14443.
42. 42)Lu X, et al. (2024). Trends and Influencing Factors in Problematic Smartphone Use Prevalence (2012–2022): A Systematic Review and Meta-Analysis. Cyberpsychology, Behavior, and Social Networking, 27 (9). DOI: 10.1089/cyber.2023.0548.
43. 43)Tóth BH, et al. (2025). Examining the effects of smartphones on posture among university students. Orvosi Hetilap, 166 (13). DOI: 10.1556/650.2025.33266.
44. 44)Liu Y, et al. (2026). Screen time and language/cognitive development in preschoolers aged 3–5 years. Complementary Therapies in Medicine, 99. DOI: 10.1016/j.ctim.2026.103390.
45. 45)Carson V, et al. (2026). Screen Time Patterns and Cognitive Development Among Preschool Children. American Journal of Preventive Medicine, 71 (4). DOI: 10.1016/j.amepre.2026.108420.
46. 46)Moldenhauer R, et al. (2026). The Interplay Between Screen Time and Outdoor Play on Preschool Children's Cognitive and Social-emotional Development. Journal of Developmental & Behavioral Pediatrics, 47 (2). DOI: 10.1097/DBP.0000000000001444.
47. 47)Xie Y, et al. (2026). The influence of smartphone addiction on sleep quality among college students. PLOS ONE, 21 (2). DOI: 10.1371/journal.pone.0340852.
48. 48)Nahidi M, et al. (2024). The relationship between mobile phone addiction and depression, anxiety, and sleep quality in medical students. International Clinical Psychopharmacology, 39 (2). DOI: 10.1097/YIC.0000000000000517.
49. 49)Khobragade AW, et al. (2025). Screen Time Among Under-Five Children in India: A Systematic Review and Meta-Analysis. Cureus, 17 (6). DOI: 10.7759/cureus.85458.
50. 50)Bakht D, et al. (2025). Assessing the Impact of Screen Time on the Motor Development of Children: A Systematic Review. Pediatric Discovery, 3 (2). DOI: 10.1002/pdi3.70002.

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