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Digital Dementia: A Growing Cognitive Concern in the Digital Era

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Abstract
Digital technology has become an essential part of modern life, transforming how individuals learn, communicate, and process information. However, its excessive and unregulated use has raised growing concerns about cognitive health. This paper examines the key causes, effects and preventive strategies related to digital dementia, with a focus on children and adolescents. The findings indicate that early exposure to screens, excessive screen time, digital amnesia, multitasking, and digital addiction contribute significantly to this condition. These behaviours reduce cognitive efforts, weaken memory retention, and limit deep information processing. This study shows that excessive digital engagement disrupts learning, attention, and sleep patterns, while also contributing to emotional instability, social isolation, and reduced psychological well-being. Continuous exposure to digital stimuli increases dependence on external memory systems, resulting in cognitive overload and mental fatigue. Preventive strategies such as digital detox, mindful technology use, cognitive engagement, physical activity, proper sleep hygiene, social interaction, parental guidance and digital literacy education can help to mitigate these effects. In conclusion, it highlights the need for a balanced approach to technology use, emphasising moderation and awareness to preserve cognitive integrity and ensure long-term well-being.

Keywords- Dementia, Cognitive Decline, Screen Time, Digital Amnesia, Technology Addiction, Attention Deficit**.**

1. INTRODUCTION

The rapid growth of digital technology has changed the way people live, learn, and interact. From smartphones to social media, technology offers convenience, speed, and constant access to information. At the same time, it raises serious questions about attention, memory, and overall well- being. Today, one of the main concerns is how digital technology affects our ability to focus, think deeply, and maintain meaningful social connections. Frequent notifications, multitasking, and continuous use of digital platforms have raised the risk of anxiety, depression, reduced attention spans and academic performance, and disrupt overall cognitive process, particularly among teenagers and adolescents as their brains are still developing and are highly sensitive to external influences (Orhan, 2025; Ali et al., 2024; Badžak et al., 2024). This exposure can influence not only mental health but also social behaviours, including empathy, self-esteem, narcissism, and the ability to form meaningful relationships (Ali et al., 2024).

Another growing concern is the effect of digital technology on memory and cognitive functioning. People often experience "digital amnesia," forgetting information because they depend on devices to store and remember it for them (Kadhiravan & Robert, 2025; Kanbay et al., 2025; Musa et al., 2023). Similarly, "cognitive offloading," the habit of depending on digital tools instead of using one's own memory, weakens mental abilities over time (Bozanta, 2025; Badžak et al., 2024). This reduces mental effort, leading to "mental atrophy," similar to how muscles weaken when they are not used (Badžak et al., 2024). According to Nagata et al. (2023), higher daily screen time has also increased the risk of behavioural and developmental issues like Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD) in children and adolescents. Furthermore, the Covid-19 pandemic boosts these concerns by increasing reliance on digital devices, reducing physical activity and disrupting daily routines (Tatsiopoulou et al., 2024). At the same time, digital environments often encourage constant task-switching, which reduces deep focus and learning efficiency (Kostić & Ranđelović, 2022).

Although there are challenges, digital technology is not entirely harmful. Some research suggests that its use may even diminish the risk of cognitive decline in older adults (Benge & Scullin, 2025). This shows that the effect of technology is complex and depends on how it is used. However, the increasing dependency on digital tools raises important questions about long-term cognitive health. Furthermore, "brain rot," a form of mental fatigue caused by excessive consumption of low-quality digital content, highlights these concerns (Özbay, 2026). This digital revolution has deeply influenced human cognition, behaviour, and social life. While it has improved convenience and connectivity, it has also introduced risks that cannot be ignored. Overall, the growing digital lifestyle raises an important question: "Are people controlling technology, or is technology shaping how people think, behave, and live?" (Orhan, 2025). So, a healthy balance between digital use and real-life engagement has become essential for maintaining cognitive health and well-being (Dăscălescu, 2022).

2. UNDERSTANDING DEMENTIA

Dementia is a condition that affects memory, thinking, reasoning, and the ability to perform everyday activities. It is not a single disease but a group of symptoms of cognitive decline. People with dementia experience confusion, disorientation, and difficulty in communication and decision-making (Dăscălescu, 2022; Morovic et al., 2019). These changes can interfere with daily life and gradually reduce individuals' independence. Globally, dementia is a major public health concern. According to Livingston et al. (2020), more than 50 million people are currently living with dementia, and this number is expected to rise to 152 million by 2050. There are several risk factors that contribute to the development of dementia, many of which are modifiable, including low education, smoking, obesity, depression, physical inactivity, and limited social engagement (Livingston et al., 2020; Livingston et al., 2017). Together, these factors account for a large proportion of dementia cases worldwide. Although dementia is associated with ageing, lifestyle and environmental factors also play a significant role and the risk is significantly increased by conditions like diabetes, high blood pressure, and hearing loss (Livingston et al., 2020). Therefore, dementia is a serious concern for both individuals and the healthcare system due to its growing prevalence and impact.

3. UNDERSTANDING DIGITAL DEMENTIA

Digital dementia refers to a decline in cognitive abilities related to excessive use of digital technology. The concept was introduced by neuroscientist Manfred Spitzer to describe how overuse of devices such as smartphones, tablets, and computers can affect memory, attention, and thinking (Kanbay et al., 2025; Badžak et al., 2024; Dăscălescu, 2022; Morovic et al., 2019). Although it is not a formally recognised medical condition, it highlights serious concerns about how technology affects the brain. This condition is closely associated with people's habit of relying on digital tools to store and retrieve information instead of actively remembering, thereby reducing cognitive exertion (Bozanta, 2025; Badžak et al., 2024). While this makes tasks easier in the short term, it diminishes mental effort and limits the brain's natural exercise, which is important for maintaining cognitive wellness (Badžak et al., 2024). Digital dementia also reflects a broader social and technological issue. It shows how modern lifestyles, driven by constant connectivity and information overload, may influence long-term cognitive health (Cho et al., 2024). While technology brings many benefits, its excessive and unbalanced use raises concerns about its impact on the human brain and everyday functioning (Orhan, 2025).

4. CAUSES OF DIGITAL DEMENTIA

Digital dementia arises from a combination of behavioural patterns and prolonged exposure to technology that gradually weakens cognitive functions. The major causes that can increase the risk of digital dementia are early use of devices, excessive screen time, digital amnesia, digital addiction, and multitasking.

4.1 Early Use of Devices

One of the major causes of digital dementia is the early exposure of children to digital devices. Children who habitually start using screens at a very young age often struggle to communicate and concentrate later in life (Kanbay et al., 2025; Takahashi et al., 2023). Studies have shown that spending long hours in front of screens during early childhood delays development, particularly in communication, problem-solving abilities, and cognitive skills (Takahashi et al., 2023). For instance, higher screen time at ages one and three increases the risk of attention problems by age seven, showing how early habits can shape later mental functioning (Christakis et al., 2004). Additionally, Kwon et al. (2024) found that two hours or more per day can lower psychological well-being among young children. These patterns suggest that early and frequent screen use disrupts the natural development of focus and learning abilities.

4.2 Excessive Screen Time

High levels of screen exposure on digital devices can lead to cognitive fatigue, weaker memory, distraction, and reduced brain adaptability (Kanbay et al., 2025). It can also negatively affects on development of children and adolescents, including lower self-esteem and curiosity, emotional instability, slower the process of learning, increased risk of premature cognitive decline, failure to achieve the goal, and difficulty in maintaining relationships (Neophytou et al., 2021; Twenge & Campbell, 2018; Maras et al., 2015). In addition, excessive exposure to digital blue light increases depression, anxiety, and reduced attention span, along with disrupted sleep patterns (Badžak et al., 2024; Montagni et al., 2016; Maras et al., 2015). These effects become more serious when daily screen time exceeds a few hours, resulting in greater distraction, weaker academic performance, cognitive difficulties, and lower overall well-being, particularly among Millennials and Generation Z (Rivera & Coombs, 2026; Cho et al., 2024).

4.3 Digital Amnesia

Another important factor is digital amnesia, in which individuals depend on devices instead of their own memory. Nowadays, people tend to remember where to find it, such as searching online or checking store data, rather than remembering information (Kanbay et al., 2025; Musa et al., 2023). This constant reliance minimises the need to store information in long-term memory and weakens deep thinking and critical reasoning skills. Over time, digital amnesia leads to poor knowledge construction, shallow information processing, and reduced memory retention (Musa et al., 2023). As a result, mental functions are gradually shifted to digital tools rather than actively used and strengthened.

4.4 Digital Addiction

These days, students are constantly engaging with social media, online games, and internet platforms, which can create a cycle of dependency that affects both mental and physical health. This form of addiction activates reward pathways in the brain, encouraging repeated use and reducing self-control over time (Kanbay et al., 2025; Baciu, 2020). It also challenges cognitive functions such as working memory, attentional control, and flexibility, making it difficult to focus on complex tasks (Rodrigues et al., 2025; Clemente-Suárez et

al., 2024). Moreover, digital dependency and technology overload can result in low productivity, depression, and digital dementia, which hinders long-term cognitive performance among adolescents (Mariappan et al., 2025; Cho et al., 2024).

4.5 Multitasking

The habit of switching between multiple tasks, such as messaging, browsing, and studying at the same time, fragments attention, overloads cognitive capacity, and reduces the brain's ability to process information effectively (Kanbay et al., 2025; Călinescu, 2024; Nabung, 2024; Clemente-Suárez et al., 2024). Frequent interruptions from notifications and digital alerts make it difficult to maintain concentration, leading to lower comprehension, weaker memory retention, and poorer academic outcomes (Călinescu, 2024; Nabung, 2024; Kostić & Ranđelović, 2022). Over time, constant task-switching creates cognitive overload and reduces the efficiency of mental processes needed for sustained attention and critical thinking (Clemente-Suárez et al., 2024). Such environments encourage shallow engagement with information, limiting the development of strong reasoning and learning skills.

5. EFFECTS OF DIGITAL DEMENTIA

Digital dementia is characterised by the externalisation of memory, fragmented attention, and disrupted sleep patterns, all of which contribute to cognitive and behavioural changes. Prolonged and excessive use of digital devices during this critical stage leads to long-term consequences for brain health, emotional development, and social functioning.

5.1 Learning and Memory

The frequent use of digital devices alters how individuals process and retain information. When information is constantly stored on an external device, the requirement for internal memory decreases. This shift encourages adolescents to process surface-level information rather than deep learning that gradually weakening long-term memory formation. Furthermore, "Google Effect," i.e. the tendency to remember where information is stored instead of recalling it directly, reduces memory retention and critical thinking ability (Kanbay et al., 2025; Clemente-Suárez et al., 2024). In addition, multitasking and continuous digital engagement diminish working memory capacity and limit cognitive efficacy (Badžak et al., 2024).

5.2 Sleep Disorders

Excessive exposure to blue light from digital devices, especially at night, suppresses melatonin production, making it harder to initiate and maintain normal sleep patterns (Kanbay et al., 2025). This disruption also affects brain structure and related neurological and emotional problems, such as depression and anxiety (Çakmak et al., 2025; Cho et al., 2024). Poor sleep patterns further impair memory consolidation, as deep sleep is essential for information processing (Badžak et al., 2024). Also, many parents reported that during home confinement, the sleeping habits of their children became worse with the increasing of screen exposure (Rivera & Coombs, 2026; Tatsiopoulou et al., 2024).

5.3 Social Isolation

Greater reliance on digital technologies, particularly social media, limits face-to-face introductions. Over time, this shift affects the development of empathy, communication skills, and emotional understanding (Kanbay et al., 2025; Çakmak et al., 2025). Additionally, "Phubbing," a behaviour in which individuals ignore others to engage with their devices, can lower the quality of social interactions (Özbay, 2026; Clemente-Suárez et al., 2024). Furthermore, social media platforms frequently promote superficial connections driven by validation criteria, thereby reducing sociability and increasing loneliness (Özbay, 2026; Çakmak et al., 2025). This pattern can impair social functioning and emotional development, especially among adolescents (Badžak et al., 2024), and also affect teacher-student relationships and classroom engagement (Călinescu, 2024).

5.4 Psychological Health

Excessive use of digital technologies often increases emotional instability and negative emotional experiences such as restlessness, guilt, and dissatisfaction (Çakmak et al., 2025). Nowadays, students experience continuous stimulation from online content, causing emotional exhaustion, numbness, decreased empathy and increased levels of tension, anxiety, and depressive symptoms that are often intensified by constant scrolling, social comparisons and the need for online validation (Özbay, 2026). Over time, dependence on instant rewards from digital platforms further weakens emotional resilience and self-esteem (Kanbay et al., 2025).

5.5 Cognitive Health

Excessive exposure to digital notifications and fast-paced content weakens cognitive functioning by reducing attention, memory, and processing speed. Individuals often experience increased destruction, poor focus, and reduced ability to retain information, making cognitive tasks more demanding (Çakmak et al., 2025; Kanbay et al., 2025; Mariappan et al., 2025). Özbay (2026) noted that continuous exposure to low-quality content leads to mental fatigue, indecisiveness, and low productivity. Furthermore, frequent multitasking and overreliance on digital entertainment direct to cognitive overload, limiting memory development and learning efficiency (Clemente-Suárez et al., 2024), and result in broader cognitive and behavioural changes over time (Cho et al., 2024).

5.6 Physical Health

Digital overuse contributes to a sedentary lifestyle that negatively affects physical well-being. The risk of health-related conditions increases with decreased physical activity (Kanbay et al., 2025). In addition, prolonged screen exposure causes eye strain, headache, poor posture, and musculoskeletal problems such as neck and back pain. These physical effects can accumulate over time and impact overall quality of life (Çakmak et al., 2025; Tatsiopoulou et al., 2024).

6. STRATEGIES TO PREVENT DIGITAL DEMENTIA

To promote cognitive and behavioural balance, various approaches have been proposed for preventing digital

dementia. These are digital detox, mindful use of technology, cognitive engagement, physical activity, sleep hygiene, social interaction, parental guidance, and educational awareness.

6.1 Digital Detox

One of the most commonly recommended approaches is digital detox, which involves intentionally staying away from digital devices for a certain period without access to blue screens, allowing the brain and mind to recover from continuous stimulation (Kanbay et al., 2025; Călinescu, 2024; Dăscălescu, 2022). During this time, individuals can engage in activities such as nature walks, meditation, and relaxation practices, thereby significantly improving mental well-being and cognitive functioning (Kanbay et al., 2025; Ali et al., 2024). Furthermore, it was found that taking regular short breaks from digital platforms and content can help to reduce stress, enhance attention, and restore mental clarity, particularly among students experiencing mental fatigue due to prolonged screen exposure (Özbay, 2026; Orhan, 2025).

6.2 Mindful Technology Use

Another important strategy involves the mindful use of technology. Mindful technology use encourages individuals to engage with digital devices in a controlled and intentional manner rather than through habitual or excessive use. Students get benefit from self-regulated learning strategies and mindfulness practices such as disabling non-essential notifications, limiting app use, setting daily screen-time limits, and scheduling device-free periods, which minimise cognitive overload and distraction, improve attention control in digital environments, and support better cognitive balance (Özbay, 2026; Nabung, 2024; Călinescu, 2024). These approaches enable individuals to promote meaningful interactions and focused tasks over passive scrolling and fragmented attention (Badžak et al., 2024).

6.3 Cognitive Engagement

Cognitive engagement through "brain fitness" plays a significant role in maintaining mental functioning. Students should engage in activities such as reading, solving puzzles, learning new skills, and creative tasks that stimulate brain activity and improve cognitive performance (Badžak et al., 2024; Dăscălescu, 2022). Kanbay et al. (2025) emphasised that physical note-taking, planning, and structured learning practices further enhance cognitive organisation and reduce reliance on digital aids. These strategies promote active mental participation and support long-term cognitive resilience.

6.4 Physical Activity

Physical activity is another component in preventing cognitive decline. Studies show that engaging in offline activities and regular exercise, such as walking, swimming, cycling, yoga and meditation, refreshes the mind, reduces digital fatigue, provides emotional satisfaction, and improves overall memory performance (Özbay, 2026; Badžak et al., 2024; Cho et al., 2024; Ali et al., 2024). Cho et al. (2024) also stated that participating in moderate intensity training on at least five days a week or high intensity training for at least twenty minutes on at least three days a week is regarded as physical exercise and has a beneficial effect on brain neurodegenerative illnesses like ADRD (Alzheimer's Disease Related Dementias).

6.5 Sleep Hygiene

Sleep hygiene and lifestyle regulation are equally important in maintaining cognitive well-being. Research suggests that maintaining 7-9 hours of adequate sleep and limiting exposure to blue screens, particularly before bedtime, enhances melatonin production that significantly supports cognitive recovery and improves overall well-being (Kanbay et al., 2025; Dăscălescu, 2022).

6.6 Social Interaction

Social interaction, engagement in offline activities and face-to-face communication promote emotional stability and cognitive resilience. Adolescents should spend time with family and peers, participate in outdoor activities, and engage in hobbies that can minimise the reliance on digital devices and promote positive mental health outcomes (Dăscălescu, 2022; Baciu, 2020).

6.7 Parental Guidance

Parental guidance plays a crucial role in managing children's use of digital devices and building resilience against the side effects of digital dementia (Ali et al., 2024; Badžak et al., 2024; Baciu, 2020). Parents should implement structured strategies such as limiting screen time, removing electronic devices from bedrooms, selecting appropriate media content, encouraging outdoor activities and physical exercise, fostering self-discipline, academic motivation, and real-life social interaction, and establishing consistent usage rules to reduce digital addiction, promote healthier digital habits, and minimise the risks of cognitive and behavioural problems (Ali et al., 2024; Baciu, 2020).

6.8 Education and Awareness

Digital literacy education has been identified as an important preventive approach. Educational institutions can promote digital literacy programs, discern trustworthy sources, responsible technology use, and the ability to evaluate digital information effectively by integrating these concepts into curricula. Furthermore, students should be encouraged to engage more deeply with learning materials, rather than passively consuming digital content, thereby minimising dependence on digital devices and enhancing cognitive development (Călinescu, 2024; Ali et al., 2024).

Overall, these preventive strategies play a significant role in mitigating the risks of digital dementia. These approaches aim to reduce digital dependency and promote balanced and responsible use of technology in digital environments.

7. CONCLUSION

In the contemporary digital landscape, the pervasive integration of smartphones, computers, and the internet has reshaped how individuals engage with information, memory, and daily life. While these "technological novelties" offer enormous access to knowledge, their excessive and unregulated use poses risks of cognitive overload, digital amnesia, and patterns of dependency that gradually impair memory and executive functioning (Călinescu, 2024;

Horoszkiewicz, 2022). The phenomenon "digital dementia" reflects not only increased screen exposure but also deeper cognitive and emotional shifts, including reliance on external memory systems and continuous digital stimulation (Cho et al., 2024). Furthermore, limiting digital exposure before sleep, maintaining structured routines for meals and physical activities, and incorporating simple habits such as the 20-20-20 rule, i.e. take a 20-second break from using the computer every 20 minutes to stare out the window at something 20 metres away, can help to preserve mental clarity and emotional stability (Dăscălescu, 2022).

Though digital technologies continue to play a critical role in modern life, influencing memory, learning, and decision-making, their benefits are closely related to how they are used. For example, active engagement with meaningful and interactive content can support cognitive development, whereas passive and overstimulating consumption may hinder attention and executive functioning (Clemente-Suárez et al., 2024). Therefore, individuals must achieve a balance between engagement and restraint by thoughtfully regulating the context, content, and duration of their digital habits to safeguard long-term mental performance and sustain cognitive integrity.

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