



Digital Dementia: Are We Becoming a Dumb Internet Generation?

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The sole author designed, analyzed, interpreted and prepared the manuscript.

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Letter to the Editor

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Dear Editor,

Humans are currently living in a digital era where we are seeing the peak of new technologies where artificial intelligence can solve large problems in a matter of seconds, and it has become a part of our lives. The proliferation of digital technology has transformed the way individuals interact, learn, and perform daily activities. While these advancements offer numerous benefits, concerns have arisen regarding the potential negative impact of excessive digital device usage on cognitive health (Spitzer, 2012). The term "digital dementia" has been coined to describe a decline in cognitive abilities, particularly among younger populations, that resembles symptoms traditionally associated with neurological disorders (Hosokawa & Katsura, 2018). This letter aims to explore the advances in the study of digital dementia by examining its definition, underlying mechanisms, impact on cognitive functions, and possible intervention strategies. Digital dementia refers to a set of symptoms characterized by cognitive decline, including memory impairment, attention deficits, and decreased problem-solving abilities, attributed to excessive use of digital devices (Spitzer, 2012). The concept was first introduced by German neuroscientist Manfred Spitzer, who argued that overreliance on technology could lead to underutilization of certain brain functions, resulting in cognitive deficits. There

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is no doubt that the use of social media and other applications, including games, is enjoyed by all age groups, but the consequences can be very severe as most adolescents spend their time in the virtual world compared to real-life. Person-to-person interaction and conversation are very important for the overall development of human life (Horoszkiewicz, 2022). Dementia is commonly seen among old people. However due to the overuse of technologies, more and more people are suffering from diminished ability to think and make critical decisions and judgments. Cutting-edge digital technologies elicit many emotions, not just in young people. It should be mentioned that using them excessively can result in addiction (Moledina and Khoja, 2018).

Key words: Digital dementia; internet generation; artificial intelligence; digital technology.

1. COMMON SYMPTOMS OF DIGITAL

Digital dementia manifests through a variety of cognitive, emotional, and physical symptoms that resemble those observed in early-onset dementia (Spitzer, 2012). While not officially recognized as a medical diagnosis, the term encapsulates the potential impairments associated with excessive digital device usage. The symptoms and characteristics include:

Memory Impairment: In case of Short-Term Memory Loss, individuals may experience difficulties in retaining new information or recalling recent events without digital assistance (Sparrow, Liu, & Wegner, 2011). Reliance on devices for information storage can weaken the brain's ability to encode and retrieve memories independently. For example, constant use of smartphones for contact information, schedules, and reminders can lead to decreased ability to remember these details without device prompts (Wilmer, Sherman, & Chein, 2017). In case of Transactive Memory Dependence, overreliance on external memory sources, such as the internet or digital devices, can reduce the need to memorize information, weakening internal memory processes (Storm & Stone, 2015).

Attention Deficits: Reduced ability to maintain focus on tasks due to constant digital interruptions (Ali et al., 2024).

Executive Dysfunction: Impaired decision-making and problem-solving skills (Loh & Kanai, 2016).

These symptoms mirror those observed in early-onset dementia, raising concerns about the long-term effects of digital overuse on brain health. Symptoms commonly associated with digital dementia include:

2. MECHANISMS UNDERLYING DIGITAL DEMENTIA INCLUDE

Cognitive Overload: Excessive exposure to digital stimuli can lead to cognitive overload,

where the brain's capacity to process information is overwhelmed (Sweller, 1988). Multitasking with digital devices may impair cognitive control and working memory, as individuals switch rapidly between tasks without fully processing information (Ophir, Nass, & Wagner, 2009).

Neuroplasticity and Brain Changes: Neuroplasticity refers to the brain's ability to reorganize itself by forming new neural connections (Draganski et al., 2004). Overuse of digital technology may alter neuroplasticity, leading to structural and functional brain changes. For example, reduced gray matter density has been observed in individuals with internet addiction, suggesting potential atrophy in regions associated with cognitive control (Yuan et al., 2011).

3. IMPACT OF DIGITAL TECHNOLOGY ON COGNITIVE FUNCTIONS

Memory: Reliance on digital devices for information storage, known as "digital offloading," may weaken memory retention and retrieval processes (Sparrow, Liu, & Wegner, 2011). Studies have shown that individuals who expect to have access to information digitally are less likely to remember it (Henkel, 2014).

Attention: Frequent use of digital devices is associated with shorter attention spans and increased susceptibility to distractions (Rosen, Lim, Carrier, & Cheever, 2011). Continuous partial attention, a state where individuals divide their attention among multiple sources, can impair deep cognitive processing (Loh & Kanai, 2016).

Executive Functions: Executive functions, including planning, problem-solving, and impulse control, may be negatively affected by excessive digital media use (Bailey, Zatorre, & Penhune, 2014). Habitual multitasking has been linked to

reduced cognitive control and increased impulsivity (Sanbonmatsu, Strayer, Medeiros-Ward, & Watson, 2013).

4. PREVENTION AND INTERVENTION STRATEGIES INCLUDES

Digital Detoxification: Digital detoxification involves reducing or eliminating the use of digital devices to alleviate cognitive overload and restore cognitive functions (Radtke et al., 2022). Interventions may include setting device-free periods and promoting mindfulness practices.

Cognitive Training and Rehabilitation: Cognitive training programs aim to enhance cognitive abilities through targeted exercises. Digital applications that promote brain training have shown promise in improving memory and attention (Klingberg, 2010). Rehabilitation strategies may also involve promoting physical activities and social interactions to stimulate cognitive functions (Karssemeijer, Aaronson, Bossers, Smits, & Olde Rikkert, 2017).

5. FUTURE DIRECTIONS REGARDING DIGITAL DEMENTIA

Technological Solutions: Developing technology that supports cognitive health, such as applications that encourage healthy digital habits, may mitigate the risks associated with digital overuse (Przybylski & Weinstein, 2017). Incorporating features like screen time tracking and usage reminders can promote self-regulation.

Policy Implications: Policies aimed at reducing excessive screen time, particularly among children and adolescents, are essential. Educational programs that raise awareness about the potential cognitive risks of digital overuse can inform better usage practices (Radesky & Christakis, 2016).

6. CONCLUSION

In conclusion we can say that advances in the study of digital dementia have highlighted the potential cognitive risks associated with excessive digital device usage. While digital technology offers numerous benefits, it is crucial to balance usage to prevent cognitive impairments. Ongoing research is needed to

further understand the mechanisms underlying digital dementia and develop effective prevention and intervention strategies.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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