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Digital Amnesia: The Erosion of Memory

Dijital Amnezi: Hafızanın Erozyonu

Yalçın Kanbay[1], Elçin Babaoğlu[2], Aydan Akkurt Yalçıntürk[2], Aysun Akçam[3]

[1]Artvin Çoruh University, Artvin
[2]Üsküdar University, Istanbul
[3]Kırşehir Ahi Evran University, Kırşehir

ABSTRACT

Digital amnesia is a condition in which our memory capacity decreases as a result of changes in our habits of accessing and storing information with the many features of modern digital devices and the internet. When people think that information is easily accessible on the Internet, they prefer to store information on digital devices rather than remember it. This situation leads to a weakening of in-depth information processing and critical thinking skills due to the ease of access to information and the immediate availability of responses. In particular, the fact that students and young adults store and rely on information on digital devices rather than taking notes negatively affects their learning and memory processes. Neuroscience research suggests that the constant flow of digital information may lead to structural and functional changes in brain regions associated with attention and memory. These changes include cognitive effects such as distraction and reduced memory functions resulting from intensive use of digital devices. Digital amnesia also has social and psychological effects. Continuous use of digital devices reduces face-to-face communication and weakens social interactions. Increased screen time and the expectation of instant access to information lead to psychological problems such as impatience, distraction, sleep problems and stress. In conclusion, digital detox, time management by limiting screen time, and sleep hygiene are important to minimize the negative effects of excessive use of digital devices and to protect cognitive health. Strategies such as memory exercises with activities such as solving puzzles and reading books, physical note-taking and planning, more face-to-face social interactions and increasing physical activity also have important effects on cognitive health protection. It is also suggested to raise public awareness through trainings on the concept of digital amnesia, its negative effects and prevention strategies.

Keywords: Cognitive functions, digital amnesia, information processing, memory

ÖZ

Dijital amnezi, modern dijital cihazların ve internetin geniş işlevleriyle birlikte, bilgiye erişim ve depolama alışkanlıklarımızın değişmesi sonucu hafıza kapasitemizin azalması durumudur. İnsanlar, bilgiye internet üzerinden kolayca erişilebileceğini düşündüklerinde, bilgiyi hafızalarına almak yerine dijital cihazlara kaydetmeyi tercih etmektedirler. Bu durum, bilgiye erişim kolaylığı ve anında yanıt bulunabilirliği nedeniyle derinlemesine bilgi işleme ve eleştirel düşünme becerilerinin zayıflamasına neden olmaktadır. Özellikle, öğrenci ve genç yetişkinlerin bilgileri dijital cihazlarda saklamaları ve not almak yerine bu cihazlara güvenmeleri, öğrenme ve hafızada bilgi saklama süreçlerini olumsuz etkilemektedir. Nörobilim araştırmaları, sürekli dijital bilgi akışının beynin dikkat ve hafıza ile ilişkili bölgelerinde yapısal ve işlevsel değişikliklere yol açabileceğini öne sürmektedir. Bu değişiklikler, dijital cihazların yoğun kullanımı sonucu ortaya çıkan dikkat dağınıklığı ve hafıza işlevlerinde azalma gibi bilişsel etkileri içerir. Ayrıca, dijital amnezi sosyal ve psikolojik etkiler de yaratmaktadır. Sürekli dijital cihaz kullanımı, yüz yüze iletişimi azaltmakta ve sosyal etkileşimlerde zayıflamaya yol açmaktadır. Artan ekran süresi ve bilgiye anında erişim beklentisi, bireylerde sabırsızlık, dikkat dağınıklığı, uyku problemleri ve stres gibi psikolojik sorunlara neden olmaktadır. Sonuç olarak, dijital cihazların aşırı kullanımının olumsuz etkilerini minimize etmek ve bilişsel sağlığı korumak amacıyla dijital detoks, ekran süresini sınırlandırarak zaman yönetimi ve uyku hijyeninin sağlanması önemlidir. Bulmaca çözme, kitap okuma gibi aktivitelerle bellek egzersizleri yapma, fiziksel not alma ve planlama, daha fazla yüz yüze sosyal etkileşimler kurma ve fiziksel aktiviteyi artırma gibi stratejilerin de bilişsel sağlığı koruma da önemli etkileri vardır. Ayrıca dijital amnezi kavramı, olumsuz etkileri ve bunları önleme stratejilerine ilişkin eğitimler yoluyla toplumsal farkındalık geliştirilmesi önerilmektedir.

Anahtar sözcükler: Bilgi işleme, bilişsel işlevler, dijital amnezi, hafıza

Address for Correspondence: Elçin Babaoğlu, Üsküdar University Faculty of Health Sciences, Nursing Department, Istanbul, Türkiye **E-mail:** elcinbabaoglu@gmail.com
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Introduction

Digital amnesia is a condition in which the mental capacity to store information decreases as a result of changing habits of accessing, remembering, and storing information with modern digital devices, their extensive functions, and the Internet. This term is defined as the erosion of memory functions as people consider information as easily accessible through digital devices. "Digital Amnesia" was coined as part of a study that was conducted by the Cyber security Kaspersky and was defined as "The experience of forgetting information that you trust a digital device to store and remember for you". This definition suggests that dependence on technology has reached a point where it is considered an extension of the human brain in the Internet age (Swaminathan 2020). Also called the "Google Effect", this refers to the tendency to not remember information when you can search for it online.

When individuals are addicted to digital devices, they always resort to smart devices when they want to search for information as a quick solution to search for any information/data on the internet, reducing the load on human memory systems. For this reason, our working memory systems are only occupied with finding the source of information, which remains only in the short-term memory. When information is just one click away, the need to remember that specific information is not felt because it can be found online quickly and our digital devices can store it for us. Such dependence on digital devices prevents us from learning new skills. As a result, without repetition, the information deteriorates rapidly and nothing is stored in the long-term memory because there is no input for repeating the information (Kaspersky Lab 2015, Wimber et al. 2015).

A study that was conducted by Kaspersky Cybersecurity has provided striking results regarding digital amnesia. According to this study, digital devices are used as digital brains to store information that people need to remember. A total of 32% of European consumers consider digital devices as an extension of their brains, 34% say that their smartphones contain almost everything they need or need to remember, and 79% say that they are more dependent on their digital devices for information access than they were five years ago. Based on the results of this study, 92% of American consumers consider their digital devices an extension of their brains, 44% say that their smartphones function as memory, storing everything they need to remember and want to have easy access to on this device, and half of them say that when they encounter a problem, they will go to the internet before remembering information and forget it immediately after using online information (Kaspersky 2015).

As a phenomenon that is a subject of research, digital amnesia is characterized by the forgetting of information that can simply be remembered. Although cognitive neuroscientists and psychologists do not yet accept it as a scientific phenomenon, they accept that excessive use of digital tools results in a decrease in the functionality of neuronal connections in the brain, which halts mental development. According to the limited literature at hand, the disadvantages of digital amnesia exceed its limited advantages. Considering the lack of reliable procedures for the safe preservation of digitally stored information/data and the threat of behavioral addiction, it is important to be aware of the increasing negative impacts of the digital amnesia phenomenon. For this reason, knowing the concept of digital amnesia and its negative impacts is important in determining prevention strategies. For this reason, the present review aims to provide up-to-date information about the concept of digital amnesia, its components, negative impacts, and prevention strategies.

Concept of Digital Amnesia

Digital technology has created radical changes in the way individuals access and process information, providing instant access to a wide range of topics (Cook and Sonnenberg 2014, Bowker et al. 2015). The proliferation of smartphones and the internet has provided unprecedented ease in obtaining, storing, and retrieving information, which has led to a significant shift towards using the information storage and retrieval functions of digital devices rather than internal memory. Mehonic et al. (2020) reported that participants who relied on external devices to store information performed worse on memory tests than those who relied on their internal memories, which suggests that dependence on external memory aids might have negative impacts on memory retention. Wegner explained this with the "Transactive Memory Theory", which refers to the use of a shared memory system in encoding, storing, and retrieving information and is also called "Group Memory". While it takes time and experience to obtain individual memory information, transactive memory, which is formed by the combination of individual information, provides the development of a common understanding by creating the sum of individual information (Wegner et al.1991). Transactive Memory, which can also be called "Know-Who", allows an individual to access information that is difficult to remember and access by benefiting from the experiences of other individuals. In his theory, Wegner et al. (1991) divided the information in the Group Memory into two (information stored in the individual memories of group members and information held by

group members). They suggested that the encryption, storage, and correction of information within a group was provided by various communication interactions between members, and for this reason, he defined "Transactive Memory as Processor Memory" (Wegner et al. 1991). Wegner's "Transactive Memory Theory" is an effective and efficient method for defining individuals' memory-sharing behaviors (Wegner et al. 1991). This theory argues that people in today's society cannot remember everything, which leads to the need for memory storage in digital devices. Also, people are becoming significantly dependent on digital devices, which increases the impact of excessive digital technology use and memory loss. In such a case, people who rely on digital devices to store their data are more likely to experience memory loss than others (Sparrow et al. 2011). In other words, forgetfulness occurs when an individual relies heavily on and believes in storing information on digital devices.

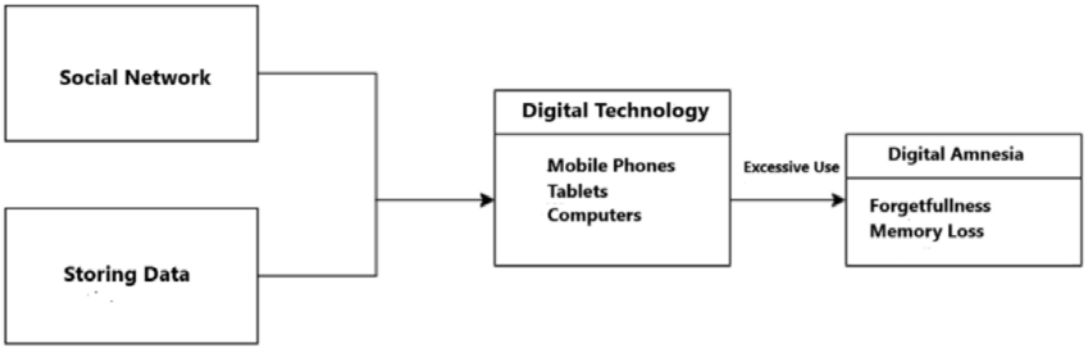

Figure 1. Conceptual framework of transactive memory theory (Wegner et al. 1991)

Individuals are at risk of decreased cognitive functions, especially memory, because of the belief and habits of being able to access information more easily with digital devices. Opinions that memory functions are eroded by the digitalization process that occurs with the frequent use of smartphones and other technological tools have attracted attention in recent years. In this context, digital amnesia has become an important concept in understanding the impacts of technology on human cognitive processes. When the concept of digital dmnesia is examined, it is seen that it has components (e.g., accessing, storing, and remembering information) that cause excessive employment of the internet and digital devices. Information about these three components is provided in the following section.

Components of Digital Amnesia

Access to Information

The rapid increase in the amount of information in the digital age causes individuals to constantly face novel information, which, as an information overload, causes individuals to rely on digital sources rather than storing information in their internal memories (Sweller 1988). The rapid access to information provided by the internet and digital devices decreases people's need to keep information in mind. It is today believed that excessive use of smartphones might cause amnesia or memory impairment in people. Constantly recording information on mobile devices decreases the possibility of transferring information to long-term memory, especially for young adults, and might cause interruptions in fully encoding information (Wimber et al. 2015). Continuous and instant access to information with digital devices encourages superficial information processing processes. The availability of instant answers and the tendency to rely on search engines inhibit deep processing and critical thinking skills. For this reason, individuals are content with superficial information processing rather than using the cognitive processes that are needed to create meaningful information. Considering these, it is extremely important to understand the impacts of Digital Amnesia on memory formation and knowledge production in today's digital world (Dixon 2015).

Digital amnesia includes studies on how individuals' constant access to information through online sources decreases the need to store this information in their memories and how this affects memory functions. To date, many studies have examined how digital amnesia changes information processing habits at both an individual and societal level. Sparrow et al. (2011) investigated the impacts of internet search engines on memory and reported that when people think that information can be easily accessed online, they rely more on external sources instead of their own memories (Sparrow et al. 2011). As a result, this decreases the effort required to

encode and store information in long-term memory, and this dependence on external sources can negatively affect the encoding and storage of memory (Ward 2013, Hamilton and Yao 2018).

Storing Information

Digital Amnesia refers to a decrease in memory capacity and the ability to retain information as a result of individuals' heavy reliance on digital devices to store and retrieve information (Musa and Ishak 2020). Individuals are transferring their mental functions to digital devices because personal information, dates, phone numbers, and other important information can be stored digitally with digital storage facilities. Also, digital stimuli are set up for planned tasks, and the constant notifications and warnings of digital devices cause distraction and a decrease in the ability to focus. Previous studies show that excessive dependence on digital devices to store information leads to Digital Amnesia and emphasize the negative impacts of digital amnesia on memory retention and knowledge creation. Participants who use digital tools exhibit lower memory retention and more superficial information processing skills compared to those who use traditional memory strategies (Musa and Ishak 2020).

Recall

Studies show that high dependence on digital devices for information retrieval might cause weakened critical thinking skills and rapid information processing. Studies have shown that even having a smartphone with you can negatively impact cognitive functions, particularly memory tasks (Thornton et al. 2014). Excessive media multitasking, in other words engaging with multiple media simultaneously, has also been associated with decreased performance on memory retrieval and working memory tasks (Uncapher et al. 2016).

A study conducted by Lodha (2019) reported that many people have difficulty remembering memories and simple information stored on their devices, for example, they cannot remember the phone numbers of their partners and parents (Lodha 2019). In a study conducted on students, Musa and Ishak (2020) reported that 70% of the participants had a high degree of smartphone addiction and 84.5% used their smartphones as reminders (Musa and Ishak 2020). In another study that examined the prevalence of digital addiction and digital amnesia in university students, Swaminathan (2020) reported that most of the participants could not remember information such as birthdays and phone numbers. These findings emphasize the potential harm of technology on memory functions. Also, in another study conducted on students, the participants accepted that preferring to store information on personal devices that they can access with the push of a button can turn into memory erosion or digital amnesia over time. In the study, the students said that they no longer remembered information they used to remember, such as birthdays and phone numbers. They also expressed concerns that excessive reliance on devices might not help students in the future, especially in exams where answers are required without remembering. This trend of dependence on devices causes extreme negative reactions such as panic and sadness in case of loss of the device. It was observed that there is a decrease in the desire to remember among students because the information can always be found on a device (Swaminathan 2020). As a result, easy access to information with digital devices negatively affects the depth of understanding and knowledge creation (Storm and Stone 2014).

Impacts of Digital Amnesia

The impacts of Digital Amnesia can be considered as, but are not limited to, memory and cognitive abilities, education, brain functionality, and social and psychological impacts.

Impacts of Digital Amnesia on Memory and Cognitive Abilities

In today's digital world, understanding the impacts of digital amnesia on memory retention and knowledge creation is extremely important (Swaminathan 2020). Concerns are emerging about the potential impacts of the intensive use of digital devices and the dependence on external sources for storing and retrieving information on individuals' memory and cognitive abilities (Sparrow et al. 2011).

In studies conducted on the impacts of digital amnesia on memory functions, it was reported that individuals have a decreased ability to remember information and instead focus on remembering where they can find it, which is also known as the "Google Effect" and shows that people tend to remember how to access information rather than directly remembering it (Sparrow et al. 2011). Previous studies suggest that the widespread use of digital devices and the internet leads to a restructuring of memory functions. In studies conducted on this subject, it was reported that informing participants that this information will be recorded after reading a series

of pieces of information decreases the rate at which participants remember information (Sparrow et al. 2011). This result shows that when individuals know that they can record any information, they trust the source from which this information is recorded rather than committing it to memory. The results of this study also suggest that individuals are more likely to remember where and how they can access a specific piece of information rather than remembering specific information. In an experimental study that examined the impacts of digital amnesia on memory and knowledge continuity, it was reported that excessive reliance on digital devices for storing information leads to digital amnesia. In this study, participants who used digital tools were found to have less strong memories and more superficial information processing compared to those who used traditional memory strategies. Based on these results, the negative impacts of digital amnesia on information processing and storage, in other words, memory, are noteworthy (Musa et al. 2023).

Digital devices allow individuals to store information digitally and access it when needed. It has been suggested that excessive use of digitally recorded information (e.g., digital photos, videos, etc.) might cause a loss of the ability to recall autobiographical events from the past in specific spatial and temporal contexts (episodic memory) as a result of relying on external storage rather than encoding memory (Van Dijck 2007). In a previous study that evaluated the impacts of using social media to record or share experiences, participants who did not use social media were found to recall their experiences more accurately than those who used social media (Tamir et al. 2018).

The impacts of digital amnesia on education: Studies conducted previously on the impacts of digital amnesia in the field of education show that students' capacity to store information in long-term memory might decrease because they store course materials on digital devices and rely on devices instead of taking notes. According to Mueller and Oppenheimer (2014), this may affect the active information processing and repetition processes that are critical in the learning process negatively. The same study also reported that taking notes by hand supports information processing and storage in memory and that digital devices might affect these processes negatively (Mueller and Oppenheimer 2014). In a multinational study, it was reported that 92% of students concentrated better when reading with printed materials, reread printed materials more than digital materials, and multitasked more when reading on screens (Baron et al. 2017). Some studies show that excessive use of digital technology might cause digital burnout. Digital burnout particularly decreases students' academic productivity, which leads to students having to study materials for longer periods, thus increasing their stress levels (Rosen and Samuel 2015).

Impacts of Digital Amnesia on Brain Structures and Functions

Studies conducted in the field of Neuroscience suggest that digital amnesia might cause structural and functional changes in the brain. Small and Vorgan (2008) reported that the constant flow of digital information can cause changes in brain regions associated with attention and memory processing. In particular, the prefrontal cortex and hippocampus were found to be affected by this process. This study provides important findings on how digital devices can change brain structure and functions (Small and Vorgan 2008).

The hippocampus, which plays key roles in memory processing and storage processes, is among the structures most affected by digital amnesia. Continuous use of digital devices might weaken hippocampal functions and cause long-term memory impairments. Also, the prefrontal cortex, which is responsible for executive functions, can be damaged as a result of constant interaction with digital devices. This can cause difficulties in attention and decision-making processes. In particular, multitasking habits might shorten attention spans and weaken concentration skills, leading to distraction. These impacts can affect individuals' daily lives and cognitive functions negatively (Small and Vorgan 2008).

Biopsychosocial studies speculate that excessive screen exposure increases the risk of cognitive, emotional, and behavioral disorders in adolescents and young adults. Chronic sensory stimulation ends up in the disruption of synaptic pathways and changes in gray and white matter volumes, increasing the risk of mental disorders and affecting memory acquisition and learning negatively. This excessive stimulation because of excessive screen time during brain development may increase the risk of amnesia and early-onset neurodegeneration in adulthood. New evidence suggests that these impacts are similar to the symptoms of mild cognitive impairment seen in the early stages of dementia. Especially, exposure to electronic media for more than 2-3 hours a day is associated with learning and memory disorders, emotional disorders, substance abuse, attention deficit, disorientation, memory problems, social functioning, and self-care problems (Neopytou et al. 2019, Manwell et al. 2022). All these impacts mean that the symptoms of neurodegeneration that must be expected in old age are increasingly seen in younger adults. It was reported in previous studies that excessive use of digital devices is

associated with cognitive impairments characteristic of dementia, such as decreased attention and memory impairment (Moledina et al. 2018).

Social and psychological impacts of digital amnesia: The social and psychological impacts of digital amnesia are also an important study topic. Carr (2010) speculated that individuals experience a decrease in face-to-face communication and social interactions as a result of constantly interacting with digital devices (Carr 2010). Also, increased screen time and the expectation of instant access to information create psychological impacts such as impatience, decreased attention and memory skills, and increased stress and sleep problems. (Yamamoto et al. 2018). This highlights the wide impacts of digital amnesia on individuals' social behavior and psychological state. A significant positive association was reported between digital amnesia, somatic symptoms, and sleep disturbances among young people (Yamamoto et al. 2018, Robert and Kadhiravan 2022). Digital amnesia has significant impacts on somatic symptoms through the mediation impact of insomnia and sleep disorders (Robert and Kadhiravan 2022).

In a study conducted in the USA with a national sample of over 40.000 children and adolescents who were aged 2-17, it was reported that screen use for more than 1 hour per day was associated with decreased psychological well-being, such as less curiosity and self-control, more inattention, difficulty making friends, emotional instability, and inability to complete tasks. In adolescents who were aged 14-17, it was also found that adolescents who used screens for more than 7 hours per day were more likely to be diagnosed with depression and anxiety, use more medication for psychological and behavioral problems, and receive help from psychiatric professionals (Twenge and Campbell 2018).

Strategies to Prevent Digital Amnesia

Methods that can be used to prevent digital amnesia include a variety of strategies to minimize the negative impacts of the overuse of digital devices and preserve cognitive health. These strategies can also help individuals achieve balance in their daily lives and decrease their dependence on digital devices.

Digital Detox

A digital detox refers to staying away from digital devices for certain periods to provide a rest period for the brain and mind. It is beneficial to engage in nature walks, meditation, and physical activities during a digital detox. Previous studies show that a digital detox decreases stress levels and improves cognitive functions (Przybylski and Weinstein 2017). Digital detox brings with it various benefits by limiting or completely stopping the use of digital devices. It improves mental health and decreases anxiety and depression levels. In particular, reducing social media use helps individuals compare themselves less and have a more positive self-perception (Twenge 2019). It also increases productivity by increasing focus, and with the elimination of constant notifications and digital distractions, individuals can better focus on their work and daily tasks (Gazzaley and Rosen 2016). Digital detox also improves sleep quality, with decreased blue light exposure and not using digital devices before bed providing deeper and uninterrupted sleep (Czeisler 2013). It strengthens face-to-face social interactions and enables higher-quality relationships, and individuals deepen their relationships by spending more time on physical social interactions (Turkle 2015). It has positive impacts on physical health, creates opportunities for more physical activity, and decreases the negative impacts of sitting for long periods (Owen et al. 2010). In general, digital detox supports the social, psychological, and physical health of individuals and improves their quality of life (Przybylski and Weinstein 2017).

Sleep Hygiene

Sleep hygiene is a set of practices and strategies to encourage good sleep habits and aim to improve sleep quality. Sleep hygiene includes steps to improve the sleep environment and sleep habits to ensure better and uninterrupted sleep. This aims to create positive impacts on both sleep duration and sleep quality. Bedtime media use was reported to have negative impacts on sleep duration, sleep quality, and daytime sleepiness in children. Children who use media devices are at increased risk for inadequate sleep duration, poor sleep quality, and excessive daytime sleepiness. Also, children who have access to media devices during the night but do not use them also experience similar sleep problems (Carter et al. 2016). For this reason, it is important to set certain rules to decrease the time spent in front of the screen, especially limiting the use of digital devices before sleep. This supports cognitive functions by improving the quality of sleep. Improving the quality of sleep is directly associated with limiting the use of digital devices (Carter et al. 2016).

Memory Exercises

Digital Amnesia describes the deterioration of memory functions resulting from excessive use of digital technology. Memory exercises play important roles in counteracting these impacts, increasing the ability to recall and store information, which can help offset the negative impacts of digital addiction. Also, memory exercises improve individuals' ability to process information independently of digital devices and increase mental resilience, making it easier for them to cope with cognitive fatigue and stress. In general, memory exercises can decrease the cognitive impairments associated with Digital Amnesia and support mental health. Using memory-strengthening techniques and exercises can decrease dependence on digital devices. These exercises include solving puzzles, reading books, and playing memory games. Memory exercises can strengthen cognitive reserve by increasing brain plasticity (Valenzuela and Sachdev 2009).

Note-Taking and Planning

To decrease dependency on digital devices, it may be beneficial to write important information in physical notebooks and use traditional calendars. This makes it easier to remember and organize information. Mueller and Oppenheimer (2014) speculated that taking notes by hand supports information processing and storage processes and that digital devices can negatively affect these processes. A study that examined the impact of taking notes on digital devices on learning has shown that using laptops solely to take notes has negative impacts on learning because this type of use might cause more superficial processing. It was reported that students who took notes using laptops performed worse on conceptual questions than students who took notes by hand. Taking more notes can often be beneficial, however, the tendency of laptop users to write down lessons verbatim rather than processing the information and restating it in their own words negatively affects the learning process (Mueller and Oppenheimer 2014).

Social Interaction

Social interaction plays important roles in preventing Digital Amnesia. Increasing face-to-face social interactions supports cognitive and emotional health by reducing digital device use. Quality time spent with family and friends positively affects mental health (Holt-Lunstad et al. 2010). Social support and face-to-face interactions support individuals' information processing, decrease stress levels, and have positive impacts on cognitive health. In this context, encouraging social interactions can help offset the negative impacts of excessive use of digital technologies.

Physical Activity

Physical activity may play important roles in alleviating digital amnesia because exercise supports brain health and cognitive functions. Digital amnesia is defined as excessive technology use affecting memory and information processing abilities negatively, while physical activity can slow down cortical atrophy and cognitive decline by increasing brain plasticity. Previous studies show that regular physical activity has positive impacts on memory-related brain regions such as the prefrontal cortex and hippocampus. For example, Erikson et al. (2013) reported that exercise protects cognitive health by increasing brain plasticity and neurogenesis, while Kramer and Colcombe (2018) emphasized the positive impacts of exercise on the prefrontal and hippocampal regions (Erichson et al. 2013, Kramer and Colcombe 2018). According to the literature data, physical activity supports memory functions and especially increases information processing, attention, and memory abilities. Also, physical activity can decrease the impacts of digital amnesia (Ratey 2008, Smith et al. 2010, Mandolesi et al. 2018). Kramer et al. (2005) also emphasized that physical activity has a balancing role in the negative impacts of digital amnesia and stated that it increases cognitive functionality (Kramer et al. 2005).

Education and Awareness

Increasing awareness on digital amnesia and being informed about the negative impacts of digital device use enables individuals to make more informed decisions (Radesky et al. 2015). Education and awareness play critical roles in preventing digital amnesia since they help individuals understand the impacts of digital technologies and develop strategies to cope with these impacts. Digital literacy training allows users to understand the harms of digital tools and develop effective usage strategies to decrease these harms. Awareness campaigns provide information about the negative impacts of technology addiction and offer practical suggestions to decrease risks. Digital detox programs encourage individuals to stay away from digital devices for certain periods and focus on

face-to-face social interactions. Also, cognitive behavioral interventions offer strategies to manage technology use and decrease the negative impacts of digital amnesia. These approaches support individuals to live a more balanced and conscious digital life (Mueller and Oppenheimer 2014, Radesky et al. 2015, Kramer and Colcombe 2018).

Conclusion

Digital amnesia involves the negative impacts of the widespread use of digital technologies and the internet on memory functions, education, brain structure, and social-psychological impacts. Scientific previous studies show that this phenomenon reshapes individuals' information processing and remembering processes, eroding or disrupting existing memory and affecting their ability to learn and/or remember.

Digital amnesia decreases the need for people to retain information in their memories because of the rapid and continuous access to information, which makes it difficult to encode information in long-term memory. Excessive dependence on digital devices weakens deep thinking and critical thinking skills while encouraging superficial information processing processes. Also, the constant use of digital devices decreases the ability to focus by distracting attention and negatively affecting memory functions. As a result, digital amnesia causes a decreased capacity in remembering and storing information, leading individuals to transfer their mental functions to digital devices.

The increased use of digital technology raised concerns regarding the possible negative impacts of digital amnesia, which causes people to forget easily accessible information they have stored on digital devices. In this context, a balanced management of the use of digital devices and the Internet will help decrease the negative impacts of digital amnesia.

Various strategies must be used to minimize the negative impacts of excessive use of digital devices and to protect cognitive health. Digital detox provides rest for the brain and mind by staying away from digital devices for certain periods. Time management supports cognitive and emotional health by limiting screen time. Sleep hygiene increases sleep quality by reducing digital device use before sleep. Memory exercises strengthen memory functions with activities such as solving puzzles and reading books. Physical note-taking and planning make it easier to remember important information. Face-to-face social interactions positively affect mental health by reducing digital device use. Physical activity supports cognitive functions with exercise. Education and awareness provide an understanding of the negative impacts of Digital Amnesia and develop strategies to cope with these impacts.

The Digital Amnesia phenomenon is still under investigation, which simply describes the easy forgetting of information that does not need to be remembered. Although cognitive neuroscientists and psychologists have not yet accepted digital amnesia as a scientific phenomenon, they accept that the decrease in trust in the mind decreases neuronal connections in the brain, which slows down its development. According to the limited literature available, the disadvantages of digital amnesia outweigh its limited advantages. Given the lack of reliable procedures for the safe preservation of digitally stored information and the threat of behavioral addiction, it is important to be aware of the increasing negative impacts of the phenomenon of digital amnesia.

Digital amnesia causes mental health issues such as sleep and somatic disorders, especially memory problems. To cope with the negative impacts of digital amnesia on mental health, it is considered that organizing awareness programs for all segments of society, especially young people, on the efficient use of digital devices will be effective. In particular, it is recommended that digital communication be paused for public health, digital detox practices be implemented, and that age-specific and other variable-specific training programs be organized to maintain or re-develop healthy lifestyles such as increasing physical activity and face-to-face social communication. Also, the prevalence of digital amnesia and risk groups need to be determined through research conducted with large samples. In light of the results reported by previous studies, it is recommended that training programs aimed at preventing digital amnesia be prepared and applied first to risk groups and then to other segments of society.

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