

# Technology and Mental Health in Youth in North America

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## ABSTRACT

Technology addiction is an emerging issue that can present itself in many ways. It is characterized by excessive and obsessive use of any form of technology. First identified by the World Health Organization as a public health concern in 2015, discussions of the dangers of excessive technology use have only risen. By 2015, 46.4% of the world's population was online, and this number has only grown (Zheng et al., 2016). As young people's technology use increases (Statistics Canada, 2021), it is crucial to examine the health implications of this phenomenon. This literature review sought to explore the impacts of technology addiction on the mental health of youth populations in North America. It focuses on defining the ways technology addiction can present itself, the impacts of the COVID-19 pandemic, and physical and mental health, while placing emphasis on these factors with respect to young people. Review of existing literature suggests that gaming disorder, problematic social media use and excessive internet use are of particular concern post-pandemic and have concerning impacts on both physical and mental health. These issues are exacerbated in youth, whose technology use has risen in recent years. As technology use increases and addiction takes on novel forms, it is vital that pathology is standardized to allow treatment pathways to be created and ensure proper diagnosis.

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## What Is Technology Addiction?

Technology addiction refers to excessive and obsessive use of technology, from smartphones to video games to online shopping. This is a phenomenon more relevant than ever as use of technology like the internet increases. By 2015, 46.4% of the world's population was online in some form, and this number has only grown (Zheng et al., 2016). Zheng et al. (2016) found that many people think that the internet has developed into part of their daily lives (70.37%), some feel that it would be difficult to live day-to-day without internet usage (16.18%), and very little believe they do not need the internet at all (0.58%).

This issue is not entirely new. The World Health Organization (WHO) first identified excessive technology use as a public health concern in 2014. The WHO then went on to hold a series of meetings to tackle growing concerns on a global scale systematically. The first conference was held in 2014 in Tokyo in partnership with the Kurihama Medical and Addiction Centre. Discussions focused on defining the issue in broad terms. The meeting addressed the epidemiology, nature and public health implications regarding the overuse of the internet, electronic devices and smartphones. The next meeting, in 2015 in Seoul with the Korean Association of Addiction Psychiatry, addressed more specific classifications of the issue. It focused on the taxonomy, spectrum and clinical descriptions of behavioural disorders that had become associated with excessive technology use. The 2016 conference was in Hong Kong SAR, with the Department of Health. Its main focus was action: how to promote health and proactive prevention, possible treatment policies and the reduction of overall public health concerns. The last meeting, in 2017, was in Istanbul with the Turkish Green Crescent Society. This conference discussed the clinical validity of gaming disorders and focused more on case presentations from various countries. Each did an overview of clinical management and these methods were further discussed.

## ICD-11, Gaming Disorder and Social Media Use

The International Classification of Diseases (ICD) is a medical classification tool maintained by the World Health Organization and used globally. It uses reported data and codes it, and these clinical terms are used for health records, statistics and death certificates. The 11th revision of the ICD

(ICD-11), which officially came into effect in 2022, was the first ICD edition to include internet-related addiction and associated disorders, in the form of Gaming Disorder. This was the introduction of internet- and technology-based disorders in medicine in general (Paschke et al., 2021). Gaming disorder is outlined in the ICD-11 as a pattern of digital gaming or video gaming distinguished by gaming becoming an increased priority over daily activities, impaired control and the continuation of gaming despite negative consequences (WHO, n.d.).

Technology addiction can also present itself as excessive social media use. Adolescents may turn to social media for many reasons. It can allow them to build social networks, which can provide support that may not be received in everyday life, explore their interests and help them find safe spaces dedicated to otherwise marginalized groups (Mayo Clinic, 2018). Social media is also designed for instant gratification and incentivizes use through likes and views (Al-Samarraie et al., 2022).

Aside from excessive use, there is also Problematic Social Media Use (PSMU). This is characterized by those who experience symptoms akin to addiction resulting from social media use (Paschke, 2021). This type of disorder occurs due to compulsive engagement with various social media, even when faced with repeated negative outcomes (Paschke, 2021).

## COVID-19, Technology Use and Youth

The lockdowns that came with the COVID-19 pandemic shifted the use of technology and the internet. Burke et al. (2021) examined technology use in youth in the form of social media use, phone and video call use, video game use, and use of television, movies and videos. They found that technology use in all forms saw a significant rise compared to pre-COVID-19 isolation measures (Burke et al., 2021). In Canada in 2021, there was increased use of technology for leisure, school and work (Statistics Canada, 2021). 48% of all Canadians used streaming services, 21% ordered groceries online, and 45% shopped online more frequently than pre-pandemic (Statistics Canada, 2021). By the end of 2020, about 9 months into lockdowns in many countries, internet service usage rose from 40% to 100% in comparison to

before the pandemic (De et al., 2020). Services that facilitate videoconferencing, such as Zoom, saw a ten times increase in usage (De et al., 2020).

These differences were more emphasized in younger populations. In 2021, Statistics Canada found that over 90% of those ages 15 to 34 reported that they had participated in more online activities since the beginning of the pandemic. This is in stark contrast with those 65 to 74, 54% of whom indicated more use of online activities (Statistics Canada, 2021). 36% of Canadians 15 years of age or older had increased internet use to facilitate working from home, and 12% used the internet to work from home for the first time (Statistics Canada, 2021). They also found that 57% of individuals aged 15 years or older increased videoconference use.

### Impact on Physical and Mental Health

Zheng et al. (2016) used questionnaires to examine complaints regarding physical health as a result of excessive internet usage. They identified fourteen main physical complaints. There were several complaints referring to problems or pain in the eye and neck regions. 73.7% reported dry eyes, 48.1% cervical pain, 34.1% headaches and 64.1% declining eyesight (Zheng et al., 2016). 31.8% indicated they had experienced lumbar pain, 19.9% weight gain, 10.7% wrist pain and 30% decreased sleep quality (Zheng et al., 2016). Other complaints included worse skin (37.8%), decreased anti-fatigue capability (27.1%), finger numbness (12.9%), greasy hair (26.9%), hair loss (9.9%) and inappetence (8.8%) (Zheng et al., 2016).

Aziz et al. (2021) affirmed through literature review that addiction to computer gaming has negative impacts on several physical health outcomes. When engaging in gameplay, users often continue to eat without physical movement, leading to possible increases in obesity rates among this demographic (Aziz et al., 2021). They further argue that joint and muscle pain may come as a result of “gamer’s thumb” from excessive use of a mouse and keyboard. Similar to general internet use, eyesight problems may arise from excessive use of computer games. Lee et al. (2019) examined the impact of prolonged gaming on binocular vision and found associations with ocular discomfort and weakened visual functions. Lack of physical activity was also observed in

those who spend more time playing video games (Aziz et al., 2021).

Ohrnberger et al. (2017) examined the relationship between physical and mental health through mediators. They found that past physical health issues had significant impacts on mental health both directly and indirectly by impacting lifestyle choices and social interactions. It can be argued that when technology addiction, whether in the form of gaming, social media use, internet use, etc., results in tolls on physical health, this can go on to have negative impacts on mental health outcomes.

Technology addiction in different forms can also have direct impacts on mental health. Increases in social media use were determined to have an association with greater anxiety and symptoms of depression (Burke et al., 2021). Researchers further determined that increased time playing video games was associated with higher anxiety. Greater use of video games and watching television and movies was also found to be associated with higher depressive symptoms (Burke et al., 2021). Excessive cell phone use has also been associated with anxiety, stress and depression (Dominguez et al., 2023).

In general, many studies have pointed to increased social media use, especially in youth, as being associated with poor mental health outcomes (Shannon et al., 2022). More time spent on social media has been associated with symptoms of depression, anxiety, lower self-esteem (Woods & Scott, 2016), decreased psychological well-being (Twenge & Campbell, 2019), and more. There is no official diagnosis for PSMU, and more research is necessary, but it has likewise been associated with negative mental health outcomes. PSMU has been correlated with depression, lower self-esteem, decreased well-being and anxiety (Andreassen et al., 2017). Further meta-analysis has shown that PSMU was a stronger predictor of depressive symptoms than simply measuring time spent on social media (Shannon et al., 2022). This is of particular significance in youth and younger populations, as Al-Samarraie et al. (2022) argue that those ages 10-25 are at higher risk of developing some form of social media addiction. A meta-analysis by Shannon et al. (2022) examined studies that looked at PSMU in adolescents and young adults and various mental health outcomes. It was found that for depression, anxiety, and stress, there were higher associations between these outcomes and PSMU than previous meta-

analyses that only investigated general time spent on social media.

## Conclusion

Technology addiction is an emerging issue encompassing several forms of excessive technology use. It may present as the ICD- and DSM-recognized Gaming Disorder, as the less studied Problematic Social Media Use, as general excessive internet use, and more. As novel problems present themselves within the realm of this issue, more research is required to fully establish the impacts of technology addiction on mental health. Based on trends examined in this literature review, it is arguable that technology use

will only increase in the coming years, and research must keep up with it. Without official diagnoses for many technology-related disorders, it is crucial to standardize pathology in order to create pathways for treatment. As outlined above, varying forms of technology addiction have direct and indirect negative impacts on mental health outcomes. As technology advances and usage increases, more work must be done to mitigate these issues.

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