

The Effects of Technology and Social Media Overuse on Physical Health and Academic Performance

Zhixin Zhang *

Suffield Academy, Suffield, U.S.A

* Corresponding Author Email: 25zz@suffieldacademy.org

Abstract. As the development of technology has grown rapidly in the last decade, technology devices help our daily lives to become more convenient. While technology has clearly transformed many aspects of our lives, an over-reliance on screens, social media, and digital devices has led to several side effects that require our attention. Over usage of technology devices could lead to Smart device addiction (SDA), SDA become a common phenomenon in society, especially for young people. This literary review included multiple studies from 2019 to 2023 about the side effects of social media addiction and unlimited screen time usage on brain health and academic performance. The finding shows that people with a higher screen time usage tend to get ADHD than those people with a lower screen time usage, furthermore, social media addiction and high screen time usage can also lead to poor sleep quality and decrement in academic performance. Younger people should value the side effects of social media and smart device addiction and prevent SDA (Smart device addiction).

Keywords: Smart devices addiction; brain health; screen time; academic performance.

1. Introduction

Technology development has grown rapidly in the last decade, and there are more and more different types of devices and software being developed, most of it makes our life more convenient, but everything comes from both sides. According to 2019 data, about 67% of the world's population uses mobile phones for communication and Internet activities. In addition, approximately 42% of the global population also uses mobile social media platforms to communicate with others, share content, and engage in social interactions. Mobile phones and mobile social media are playing an important role in modern life and that more and more people are joining this digital age [1]. A lot of young people nowadays addicted to the usage of technology devices, such as their phone, TV, or the internet-based social media, especially teenagers have occurred to have this type of problem. The widespread popularity of social media and easy access to the Internet have given people ubiquitous social media platforms, and it is this convenience that also increases the risk of social media abuse. However, it also raises the possibility that overuse of social media leads to addiction. When people are obsessed with social media, they tend to neglect other important aspects of their daily lives [2]. Social media addiction can have a negative impact on an individual's emotional state. Excessive use of social media may also cause distress to interpersonal relationships. Staring at the screen for a long time will have a negative impact on physical health [2]. Once people get addicted to technology devices or social media, they tend to communicate less with other people in real life, instead, they will spend a large amount of time on their phone, computer, or TV. Young people have demonstrated a penchant for utilizing the Internet for social networking, chatting, and gaming. According to a study by the Pew Research Center, 92% of the young people asked said they use the internet daily, with 24% claiming they use it "almost constantly" [3]. In Europe, where research suggests young people are using numerous devices to access the internet, the situation is similar [3]. According to American statistics, children between the ages of 8 and 18 engage with media for an average of seven and a half hours every day [3]. Some studies have suggested that prolonged TV viewing in children before the age of 3 May be linked to attention problems in adolescence [3]. Therefore, this means that excessive exposure to TV in early childhood may have a slightly negative impact on their cognitive outcomes later in life [3].

This paper is going to be presented in literary review, this literary review is going to focus on analyzing and discuss existing reviews and research papers since 2019, about the relationship of younger people and teenagers with technology and social media, furthermore, the possible effects of immoderate usage of technology and social media could have on younger people's physical health and academic performance.

2. The Effects of Technology and Social Media Physically

As technology continues to become intertwined with everyday life, it is important to understand the complex ways technology shapes the brain, it's also important to form a healthy digital habit. Researchers pointing out that the overuse of smartphones and social media can lead to technology addiction, attention-deficit hyperactivity disorder (ADHD), studies also pointed out that permissive usage of technologies has effects on the brain especially for teenagers who are still developing physically. A number of studies have found a connection between using a computer or spending a lot of time in front of a screen (such as watching television or playing video games) and ADHD symptoms [4]. People who are continually utilizing technology have less opportunity to socialize offline and give their brains a chance to switch to their default state [4].

2.1. Creating a Lack of Concentration

According to certain studies, young children who constantly use technology could develop ADHD [5]. The STU (screen time use) of children with ADHD (attention-deficit hyperactivity disorder) tends to be longer and the severity of the disorder's symptoms is often higher. These tracts are typically involved in tasks that require visual processing. The outcomes of longitudinal analyses demonstrate a direct association between the white matter microstructure and the ADHD scale as well as a reciprocal relationship between the ADHD scale and STU. Additionally, the relationship between the ADHD polygenic risk score and STU is mediated by a decrease in FA in a number of white matter tracts [5].

2.2. Effects on Sleep

The increase in screen time may have a negative effect on sleep, and this effect may cause cognitive and behavioral harm. Studies have shown that frequent use of touch-screen devices in infants and toddlers can lead to difficulties in initiating sleep, reduced sleep duration, and increased night-time awakenings [4]. Excessive tablet use in teens was associated with poorer sleep quality and multiple awakenings after falling asleep, while more time spent on smartphones and touch screens was associated with more severe sleep disruption.

This means that over-reliance on screen devices may disrupt normal circadian rhythms and prevent people from achieving deep and high-quality sleep. Especially when using these devices at night, it can be difficult to relax and fall asleep quickly due to light stimulation and psychological excitement caused by things like social media or games. In addition, constant exposure to screen light at night also suppresses melatonin, a hormone that regulates our day and night rhythms, further disrupting sleep. This can lead to reduced sleep quality and affect daytime attention, memory and emotional regulation. The latest research shows that when people are exposed to radiofrequency electromagnetic fields generated by mobile phones, this radiation may have an impact on sleep structure in addition to the effects of light on sleep. A double-blind study of a small sample of adults (n=48) found that when this group was exposed to a radiofrequency electromagnetic field for up to 3 hours before falling asleep, their slow-wave sleep duration decreased slightly, and the time required for slow-wave sleep to enter the state increased [3]. The health effects of phone screen radiation are not entirely clear, but reducing slow-wave sleep is relevant, such as insomnia and job burnout. The increase of the sample coverage can make this more convincing also alert more people to manage their screen usage.

3. Social Media Over use on Academic Performance

3.1. The Relation Between Social Media Addiction and Academic Performance

There is a relationship between social media addiction and academic achievement. While this relationship may vary from individual to individual, overall, excessive use of social media can have a negative impact on academics. First, social media addiction often leads to time management difficulties. When a person is addicted to social media, they may spend a lot of time browsing, commenting, and sharing content. This lack of effective time management can lead to academic tasks being delayed or not completed on time. Secondly, excessive use of social media can also cause distraction problems. Social media platforms often attract users with their engaging features (such as fresh content, instant feedback, etc.) and keep them trapped in a cycle of constantly refreshing information streams. This frequent diversion of attention weakens the individual's concentration and ability to concentrate on the course content, easily distracts and loses deep comprehension when reading, writing or solving problems.

In addition, long-term excessive use of social media may also have a negative impact on sleep quality. Studies have shown a link between excessive social media use and sleep problems, such as insomnia and waking up during the night. Lack of or poor-quality sleep can lead to reduced learning and memory abilities, affecting mental clarity and concentration levels, which can negatively impact academic performance. However, not everyone who uses social media suffers from this negative impact. Some people may be able to manage their time effectively and maintain good academic performance. In addition, sometimes social media can be used legitimately as an educational tool or access to information. In summary, in most cases, excessive use of social media tends to be associated with lower academic achievement. Therefore, in order to achieve better academic achievement, individuals should be aware of and control how much they rely on social media and establish healthy time management habits to improve focus and productivity.

Two cross-sectional self-reports collected by young adults enrolled in a sizable public university in northwest India make up the research. The target demographic was young persons aged 17 to 27 who actively utilized WhatsApp, a well-liked MIM app in India [6]. There are two groups in the study: A and B. 1398 MIM users in Group A, aged 19 to 27, are enrolled full-time in a master's degree at the university. 472 MIM users who were not full-time college students and were between the ages of 18 and 23 made up Group B. They were enrolled in a remote learning course. The study has concentrated on looking at the many correlates of social media fatigue brought on by using WhatsApp, a very well-liked MIM app [6]. The study also examined the impact of social media fatigue on the reduced academic performance of young people taking university exams. The results show that when using WhatsApp, social comparison, self-disclosure, and intensity of use are important factors that lead to mobile instant messaging (MIM) fatigue, and this fatigue further leads to lower academic performance among college students [6]. If the App sample chosen by this research is more than one, the research can be more convincing and increase the social media coverage covered by this research. This study can only explain the relationship between social media fatigue and academic performance in India because the participants are all from the same region.

3.2. Social Media Addiction Effects on Mental Health

The impact of social media addiction on mental health is a topic of much concern. With the increasing popularity and frequency of use of social media in our daily lives, more and more people are beginning to realize that over-reliance on social media may have a negative impact on their mental health.

First, social media addiction may lead to addiction to the virtual world and neglect of real life. People often spend so much time browsing, Posting, and interacting with other users that they can't focus on what's going on around them. This behavior not only weakens the individual's bonds with family and friends but can also lead to feelings of isolation and depression. Secondly, excessive use of social media is also prone to anxiety and self-esteem problems. Keeping in constant contact by

comparing oneself to the perfect life or appearance presented by other users can, in some cases, make individuals feel inadequate or inferior. In addition, being bullied or criticized online may also damage a person's sense of self-worth and confidence. In addition, due to the fragmentation of information and the simplicity of expression on social media, long-term use of social media may affect an individual's attention and depth of thinking. Studies have shown that too much exposure to the flood of information on social media can lead to problems such as distraction, lack of concentration and memory loss. Finally, social media addiction has also been linked to decreased sleep quality. When you use your phone or other electronic device to browse social media at night, the stimulation of blue light suppresses melatonin production, which interferes with normal sleep patterns. In the long run, this bad habit can lead to problems such as insomnia, fatigue and mood swings. According to some research, Happiness and social anxiety were revealed to be predictors of social media addiction in this study [7]. The findings demonstrated that social anxiety and happiness among students strongly predicted their use of social media [7].

3.3. The Effect of Social Media on Anxiety

While social media brings massive information, it also breeds problems such as information overload and information cocoon [8,9]. With the explosion of social media, some media sell anxiety, so that some people may have more anxiety and confusion in the network emotional atmosphere and information bombardment [10]. With the explosive growth of social media, some media communication anxiety has become a common problem that needs attention and solution. People should use social media more carefully and learn to sift through information and exercise objective judgment to reduce the negative impact of the online environment on our mental health.

4. Conclusion

This literary review paper focused on presenting the relationship between smart devices addictions and attention deficit, furthermore, smart devices addictions effects on academic performance. A research study about STU (Screen time utilization) connection with polygenic risk for Attention deficit-hyperactive disorder (ADHD) indicates that the children who have a higher polygenic risk scores for ADHD tend to have a higher screen time utilization and more severe ADHD symptoms. People's frequent use of smart devices and social media heightens ADHD symptoms, this behavior could eventually lead to some addictive behaviors, it will also interference the brain development and sleep. There's another study shows that social media usage can affect academic performance. There's also research consisted of 161 students at the University of Health Sciences, Hamidiye Vocational School of Health Services as the participants, the students were selected by the simple randomization method. The study shows that blue light affects melatonin production and can affect sleep, in conjunction with good sleep hygiene, limiting the access to blue light before bed will help people to build better sleep quality. In this way, it is better to limit the utilization of screen time for the young people to prevent future problems, such as ADHD, smart devices addictions, also to make sure their mental development won't be interfered, especially for the children. The comparative study about social media addiction between university students and high school students consisted of 700 participants, 49% were female, 51% were male, 57% participants were high school students, 43% were University students. The study shows that the social media addiction level of the high school students is higher than the social media level of university students, the factors can be claimed as age of group, educational status, anxiety, and more. Gender also plays a really important role in here; study shows that female students are easier to get addicted to social media than male students. However, the result from this research is limited in certain perspectives, the participants in this research are all students from Turkey, and the study can be more convincing if the coverage of the participants can include students from other countries, another factor is the research pointed out not all the high school students have access to a smartphone or computer, so it's difficult to use the data

collected in certain private school to define the overall situation of students' relationship with smartphone usage and social media addiction in Turkey

References

- [1] Li Xia. Research on the digital labor value of Internet users. Institutes Of Technology Of South China, 2022.
- [2] Chen Yao. The relationship between attribution needs and Internet addiction among college students: the mediating role of missed fear and social media use and its intervention study. Changjiang University, 2023.
- [3] Gottschalk F. Impacts of technology use on children: Exploring literature on the brain, cognition and well-being. 2019.
- [4] Ren Qingqing. Correlation analysis of emotion recognition features and clinical symptoms in ADHD. Bengbu Medical College, 2023.
- [5] Zhang Yingying. Comprehensive intervention for children with ADHD (liver / kidney Yin deficiency) Internet addiction based on network time management. Tianjin University of Traditional Chinese Medicine, 2023.
- [6] Malik A, Dhir A, Kaur P, et al. Correlation between social media fatigue and decreased academic performance: a large cross-sectional study. *Information Technology and People*, 2020, 34(2): 557-580.
- [7] Bu Qingliang. Yan Na. Shen Xinyu. Et al. Medical students are uncertain about the relationship between psychological stress and mobile phone addiction —— Chain mediation role of social anxiety and depression. *Modern preventive medicine*, 2023, 50(15):2791-2795+2803.
- [8] Wang Qian, Sun Junqing. The formation and guidance of social anxiety under the media visual threshold. *Journal of Beijing Union University (Humanities and Social Sciences Edition)*, 2020, 18(01): 34-40.
- [9] Hu Jingwen. Study of the impact of social media use on parental educational anxiety. Institutes Of Technology Of South China, 2022.
- [10] Feng Bo, Song Lili. Interpretation of the current situation of Chinese urban parents' education anxiety. *Management observation*, 2018, 23: 141-143.