

The Effect of Technology Use on Mental Health during the COVID-19 Quarantine

Group 5: Audrey Gao, Mia Liu, Kaylie Yung, Sathvik Tamirisa.

Guided by Mentor: Soha Ahmadi.

August 29, 2021

**Introduction**

Caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), the novel coronavirus disease 2019 (COVID-19) is a communicable respiratory disease that was first observed in December 2019 in Wuhan, China (Sauer, 2021; World Health Organization, 2020a). Symptoms include but are not limited to difficulty breathing, fever, and nausea (Sauer, 2021). As a result of the disease’s severity, as well as its rapid rate of infection, the World Health Organization (WHO) officially declared that COVID-19 could be considered a pandemic on March 11, 2020 (World Health Organization, 2020b). Consequently, countries across the world have enacted social distancing protocols (Vogal and Eggertson, 2020). Many have rearranged their lives in such a way that their daily affairs now take place online (Chen et al., 2021), and in-person interactions have been limited. This is seen in the shift to online learning and working from home, as well as the general increase in the use of technology (Chen et al., 2021). Such a drastic shift in lifestyle has resulted in many reporting an increase in psychological distress and overall a worsened state of mental health, made worse by barriers to access to online mental health services (Hawke et al., 2021). Furthermore, feelings of loneliness and stress have been exacerbated by a sense of fear due to the rapid dissemination of unreliable information on social media (Lin et al., 2020). Thus, it is seen that the rise in problematic use of technology during quarantine has resulted in increased rates of psychological distress (Lin et al., 2020). This paper serves to examine the mental health impacts of isolation during the COVID-19 pandemic. Research and data collected are categorized by the age groups of children and young adults and analyzed in relation to technological usage. Ultimately, this paper seeks to identify and promote better coping mechanisms that can be utilized in the future.

**Methods**

A combination of news articles and peer-reviewed papers examining the effect of quarantine on mental health were consulted throughout this process. News articles were used to provide real-life examples of impact, while scientific papers provided explanations of various research methods and quantitative data (Aksut, 2020; Chen et al., 2021; Hawke et al., 2021; Lin et al., 2020). It was ensured that news articles came from reputable publishers, and any information was cross-referenced with other sources. The majority of research papers were found through databases such as The National Center for Biotechnology Information (NCBI). Search bar entries included key terms such as “mental health,” “quarantine,” “technology,” and “social media.” To ensure that all information was relevant, only studies focussing specifically on COVID-19 induced quarantine were referenced. Furthermore, studies were required to include a comparison of mental health before and after quarantine, as well as an appropriate experiment detailing the origins of this information. Studies that were deemed eligible were then summarized and compared to arrive at a cohesive conclusion.

To conduct research, every study employed the use of surveys. Participants shared information about their age, gender, and ethnicity, as well as study-specific qualitative categories (Chen et al., 2021; Hawke et al., 2021; Lin et al., 2020). A study by Chen et al. (2021) assessed the relationship between COVID-19-related social media usage and stress levels of 550 Chinese school children. The study spanned five months (November 2019 to March 2020) and consisted of two surveys. Similarly, Lin et al. (2020) also implemented surveys to explore the link between COVID-19-related problematic usage of social media and psychological stress. Lin et al.’s (2020) study consisted of an initial survey, a follow-up one week later, and then a final report two weeks after the initial survey. By contrast, Hawke et al. (2021) analyzed youths’ preferences of and access to mental health services using a single survey in August 2020. The age range in participants varied slightly, as Chen et al. (2021) and Hawke et al. (2021) focused on youth (third to sixth graders and 14 to 29 years old, respectively) while Lin et al. (2020) surveyed 1078 young Iranian adults. To quantify their responses, all three studies used a variety of indexes. Chen et al. (2021) referred to the Smartphone Application-Based Addiction Scale (SABAS), Bergen Social Media Addiction Scale (BSMAS), Internet Gaming Disorder Scale-Short Form (IGDS-SF9), and Depression, Anxiety, Stress Scale-21 (DASS-21). Similarly, Lin et al. (2020) used the Hospital Anxiety and Depression Scale (HADS), Insomnia Severity Index (ISI), Bergen Social Media Addiction Scale (BSMAS), and Fear of COVID-19 Scale (FCV-19S). Hawke et al referenced the GAIN-Short Screener (GAIN-SS).

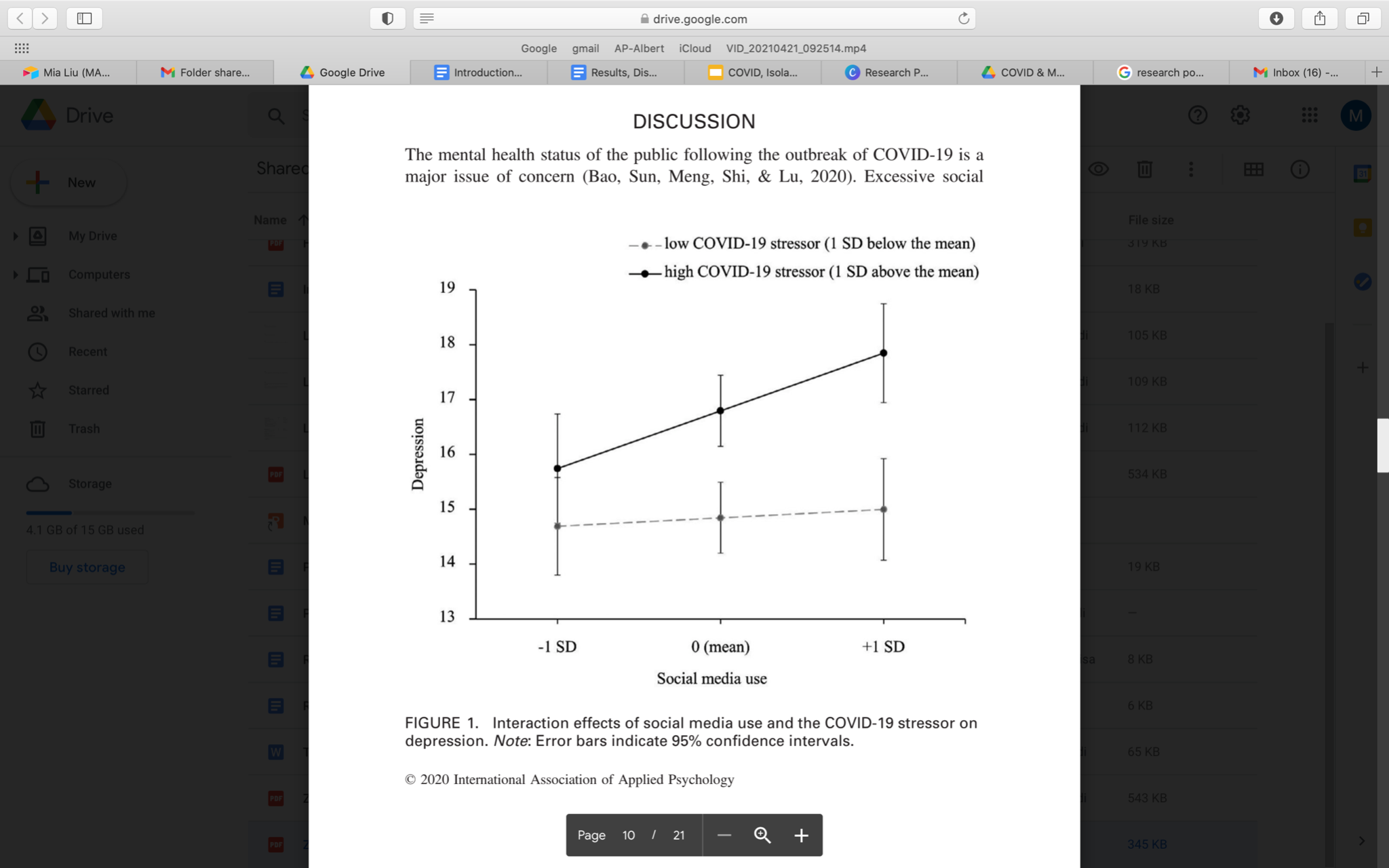
**Results**

In Chen et al.’s (2021) study, schoolchildren were surveyed in regards to changes in social media usage and stress levels when subjected to remote learning models during the Covid-19 pandemic. By analyzing the results of the surveys, it was found that the mean time spent on smartphones increased significantly between Time 1 and Time 2. Similarly, a significant increase was observed in the mean time spent on social media between Time 1 and Time 2. However, the mean time spent gaming at Time 2 did not differ much from the Time 1 mean. With reference to the four aforementioned scales, the schoolchildren reported having higher levels of problematic smartphone application use at Time 2. That being said, problematic social media use and gaming both lowered by Time 2. Ultimately though, the mean DASS-21 score, signifying psychological distress, increased greatly from Time 1 to Time 2, going from a mean of 0.46 to a mean of 1.22.

Though Chen et al. (2021) focused on the usage of technology as a whole, Lin et al. (2020) focused on the COVID-19-related problematic usage of social media, specifically amongst adults over the age of 18 in Iran. To establish the premise, (Lin et al. 2020) cross-referenced various studies that establish a close link between fear and psychological stress (Lin, 2020; Ren et al., 2020). By using the BSMAS and HADS index, the unstandardized coefficient and Bootstrapping SE both suggested that there exists a positive relationship between fear and social-media-related misunderstanding of the pandemic. Correspondingly, Zhao and Zhou (2020) confirm such results, indicating that COVID-19-related increased social media use indirectly leads to higher levels of stress, depression, and anxiety (see figure 1 below).

**Figure 1**

*Interactions between Social Media Use, COVID-19 stressor, and Depression with 95% confidence intervals.*



*Note*: This figure is adapted from Zhao and Zhou (2020) and serves to demonstrate the relationship between depression and social media use via the COVID-19 stressor. The COVID-19 stressor measures individuals’ vulnerability to mental health issues amidst disastrous circumstances. The stressor data comes from a 10-point survey concerning what activities participants have been involved in during the COVID-19 pandemic. The two lines represent data 1 standard deviation above and below the mean. Although the dotted line is less inclined, both linear representations have a positive slope, thereby indicating a positive relationship between COVID-19-related social media use and depression.

Given the increased technology use and aggravated mental health issues during the COVID-19 pandemic, youths stand out as a group particularly affected. As a result, Hawke et al. (2021) examined the scope and implications of mental health services for youth. The study found that the majority of youth would consider virtual services, although most preferred an individual experience rather than a group setting. Of those who considered a virtual experience, further survey results showed that video calls created the optimal sharing environment, in comparison to voice calls or texts.

**Discussion**

Although limits in sample size were found in all three studies due to geographical and national barriers, the results of the studies are well structured and consistent. Of the three studies, Chen et al. (2021) and Lin et al. (2020) established a strong positive correlation between time spent in quarantine, technology use, and mental health issues.

Aside from such results, Chen et al. (2021) found that while schoolchildren in Mainland China increased their time on smartphones and social media during the online learning period, they did not increase their time gaming. Though the increased times may have been a result of needing to facilitate online learning and virtual communication with friends and family, the decrease in problematic social media use and gaming was a surprise to the authors. A potential explanation is offered: parents may have allowed children to use social media and game more during the online learning period. Thus, while the time spent performing these activities may have increased, the time itself was not inherently problematic. Chen et al. (2021) also stated the possibility of the schoolchildren being dishonest in their self reporting. As a result, future studies may wish to incorporate some way of verifying an, such as giving parents a chance to also respond.

When it comes to mental health services for youth, the Hawke et al. (2021) study found that despite this interest and notable advantages in online services, some youth have not participated for one of three reasons. Firstly, many stated that communicating online lacked the sense of human connection that in-person services offered. Beyond that, for some there were barriers to access; technological issues such as an unstable internet connection made it difficult to run smooth sessions. Thirdly, many considered the safety ramifications of both using an online platform as well as attending sessions while in possibly unsafe locations such as at home.

**Conclusion**

Given the clear negative psychological impact quarantine, and by extension increased access to technology, has on mental health - it is clear that action must be taken on an individual and community level (Chen et al., 2021; Hawke et al., 2021; Lin et al, 2020). More specifically, Chen et al. (2021) explained that although online activity as a whole cannot be prohibited, caregivers should pay attention to what their children are engaging with online. Additionally, healthcare providers and government officials should actively monitor the spread of misinformation on social media in order to lessen any possible paranoia or distress.

Similarly, Lin et al. (2020) stated that the positive relationship between social media misinformation and psychological stress demonstrates an increased need for online campaigns that help spread awareness of true facts and hamper false beliefs regarding COVID-19. Provided that fear is closely linked to psychological stress (Lin, 2020; Ren et al., 2020), such campaigns will eliminate unnecessary fear, and thus reduce misinformation related mental health issues.

For youths, given the responses of surveyed youth as well as the aforementioned three barriers to access (Hawke et al., 2021), it is imperative to continue listening to the perspectives of the youth most in need. Additionally, local services such as community centres should seek to increase access to technology, free of cost. This can be realized in the form of open access to a stable internet connection, as well as shared devices that can be used for free. Finally, seeing that the overwhelming consensus is that virtual services simply lacked the human connection that in-person services offered, it is imperative that government officials continue to enforce quarantine and reopening procedures so that youth can return to in-person services as soon as possible. This conclusion is supported by another study by Hawke et al. 's (2019) which focused on the accessibility and refinement of mental health and substance use services for youth. Evidence collected from 28 peer-reviewed journals by service providers indicate that youth participation, tailored consultation, and intersectional inclusion together form an excellent paradigm for such services.

When it comes to youth, government efforts in reducing cost and increasing accessibility to virtual mental health services are key in helping youth cope with mental health issues when faced with the COVID-19 pandemic (Hawke et al., 2021). With all analysis combined, it is reasonable to conclude that viable solutions to isolation-induced mental health issues include the enforcement of measures which curate safe virtual and in-person environments - such as consistent fact checking services online and guidance available to those in need. If such solutions can be realized, it is hopeful that people of all age groups can become more equipped when coping with mental health issues in the foreseeable future.

**References**

Chen, I., Chen, C., Pakpour, A. H., Griffiths, M. D., Lin, C., Li, X., & Tsang, H. W. H. (2021).

Problematic internet-related behaviors mediate the associations between levels of

internet engagement and distress among schoolchildren during COVID-19 lockdown: A longitudinal structural equation modeling study, *Journal of Behavioral Addictions JBA*, *10*(1), 135-148. Retrieved Jul 17, 2021, from <https://akjournals.com/view/journals/2006/10/1/article-p135.xml>

F. Aksut Bootleg Alcohol Kills 194 People in Iran Anadolu Agency (2020) (March 22,

2020.

<https://www.aa.com.tr/en/middle-east/bootleg-alcohol-kills-194-people-in-iran/1774565>

Hawke, L. D., Mehra, K., Settipani, C., Relihan, J., Darnay, K., Chaim, G., & Henderson, J.

(2019, April 27). What makes mental health and substance use services youth friendly? A scoping review of literature. BMC Health Services Research. <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4066-5#Sec45>.

Hawke, L. D., Sheikhan, N. Y., MacCon, K., & Henderson, J. (2021, April 14). Going virtual:

youth attitudes toward and experiences of virtual mental health and substance use services during the COVID-19 pandemic. BMC health services research. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8045568/>.

Lin, C. Y., Broström, A., Griffiths, M. D., & Pakpour, A. H. (2020). Investigating mediated

effects of fear of COVID-19 and COVID-19 misunderstanding in the association

between problematic social media use, psychological distress, and insomnia. *Internet*

*Interventions*, *21*. <https://doi.org/10.1016/j.invent.2020.100345>

Ren, S., Gao, R., & Chen, Y. (2020, February 26). Fear can be more harmful than the

severe acute respiratory syndrome coronavirus 2 in controlling the coronavirus

disease 2019 epidemic. <https://www.wjgnet.com/2307-8960/full/v8/i4/652.htm>

Sauer, Lauren M. (2021, May 19). What Is Coronavirus?

<https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus>

U.S. National Library of Medicine. (n.d.). National Center for Biotechnology Information.

National Center for Biotechnology Information. <https://www.ncbi.nlm.nih.gov/>.

Vogel, LAauren., Eggerston, Laura. (n.d.). COVID-19: A timeline of Canada's first-wave

response. CMAJ News. <https://cmajnews.com/2020/06/12/coronavirus-1095847/>.

World Health Organization. (2020, March 11). WHO Director-General's opening remarks at

the media briefing on COVID-19 - 11 March 2020.

<https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>

World Health Organization. (2020, June 29). Listings of WHO’s response to COVID-19.

<https://www.who.int/news/item/29-06-2020-covidtimeline>

Zhao, N., & Zhou, G. (2020, September 17). *Social media use and mental health during THE*

*COVID‐19 pandemic: Moderator role of disaster stressor and MEDIATOR role of negative affect*. International Association of Applied Psychology. <https://iaap-journals.onlinelibrary.wiley.com/doi/full/10.1111/aphw.12226>.