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Social Media Use and Loneliness During the COVID-19 Pandemic

Katelyn Hughes

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SOCIAL MEDIA USE AND LONELINESS DURING THE COVID-19 PANDEMIC

by

KATELYN HUGHES

(Under the Direction of Michael Nielson)

ABSTRACT

Social media has played a prominent role in society as a safe way of communicating and connecting with friends, family, and others during the time of the COVID-19 pandemic of 2020. This study examined the general use of social media over the time of the COVID-19 pandemic and correlations with levels of loneliness, depression, anxiety, and stress in comparison to how people felt about their social media use before the pandemic. This study collected self-reported introspection on social media use during the pandemic and before the pandemic from Georgia Southern University students to compare if there are less feelings of loneliness and depression when using social media during the pandemic than before. Contrary to predictions, the results of the correlational analyses trended opposite to our hypothesized results.

INDEX WORDS: Social media, Loneliness, Depression, Anxiety, Stress, COVID-19, Pandemic, Social media use, Coronavirus, Mental health

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KATELYN HUGHES

B.S., Georgia Southern University, 2020

A Thesis Submitted to the Graduate Faculty of Georgia Southern University

in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

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TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	2
LIST OF TABLES.....	4
CHAPTER	
1 INTRODUCTION.....	5
Purpose of the Study.....	5
Social media	5
Negative Factors of Social Media Use.....	7
Problematic Social Media Use.....	8
Positive Outcomes of Social Media Use.....	10
Social media use and mental health promotions.....	11
Social media use and mental health stigma.....	13
Age differences in social media use.....	14
Hypotheses.....	14
2 METHOD.....	15
Participants.....	15
Measures.....	15
Procedure.....	17
3 RESULTS.....	19
Time Spent on Social Media	19
Correlations.....	20
Regression Analyses.....	22
Directionality.....	23
Social Media Addiction.....	23
4 DISCUSSION.....	24
Limitations.....	24
Conclusion.....	26
REFERENCES	27
APPENDICES	
A BERGEN SOCIAL NETWORKING ADDICTION SCALE	30
B DEPRESSION, ANXIETY, AND STRESS SCALE-21.....	31
C UCLA LONELINESS SCALE (VERSION 3).....	33
D GENERAL AMOUNT OF TIME SPENT ON SOCIAL MEDIA.....	35
E TIME SPENT ON SPECIFIC SOCIAL MEDIA SITES.....	36
F DIRECTIONALITY.....	37
G REGRESSION ANXIETY.....	38
H REGRESSION DEPRESSION.....	39
I REGRESSION STRESS.....	40
J REGRESSION LONELINESS.....	41

LIST OF TABLES

	Page
Table 1: Minutes Spent Daily on Social Media Sites	19
Table 2: Correlations of Key Variables Across Both Conditions.....	20
Table 3: Correlations of Key Variables Before the Pandemic	21
Table 4: Correlations of Key Variables During the Pandemic	21

CHAPTER 1 INTRODUCTION

Purpose of the Study

This study examined people's reports of social media use during the pandemic in order to learn if the pandemic may have impacted the correlation of social media use with loneliness, depression, anxiety, and stress. Previous research has demonstrated a positive correlation between social media use and mental health variables such as loneliness, depression, anxiety, and stress. This study examined the relationships among these variables may have changed as people experienced the pandemic. Specifically, the author was interested in seeing if social media is utilized during the time of the COVID-19 pandemic in order to relieve feelings of loneliness, depression, anxiety, and stress. Therefore, the present study investigated ratings of loneliness, depression, and anxiety in conjunction with social media use before vs. during the pandemic. Whereas many studies focus on problematic social media use or how misinformation spreads on social media, the present research investigates the possibility that the correlation between social media use and mental health has changed during the COVID-19 pandemic. This study addressed how the use of social media could correlate with aspects of mental health, focusing particularly on loneliness, depression, anxiety, and stress. The study examined how social media use and mental health is perceived by the participants during the time of the pandemic and through recollection of their social media use before the pandemic using self-report measure.

Social Media

Social media includes the use of internet platforms that can connect people whether local or international. Social media can be utilized for personal, social, and work-related activities. During the COVID-19 pandemic, there has been more use of social media as we strive to find safer ways to communicate and stay connected with friends and family during a time where people are not able to easily see other people in person. Social media use saw a $\times 50$ surge from 0.4 million in January to an astounding 20.3 million in March 2020 (Dhajima, Chaudhury, & Saldanha, 2020). In the time of the Coronavirus pandemic of 2020-2021, there have been limitations on the population's ability to interact with other people physically. Given these circumstances, it seems interesting to explore if social media has been helpful to lessen feelings of isolation and loneliness by the way many social media platforms can connect users to others, whether they are strangers, friends, or family. Classes are held via zoom meetings, social media sites are used to connect with friends and relatives, and face-to-technology-to-face programs such as zoom meetings have been utilized to connect people for education, work, and social reasons during the pandemic of 2020. Social media is arguably used more often during the past year of the pandemic whether for work, social, or personal use (Dhajima, Chaudhury, & Saldanha, 2020). Social

media has been more integrated into the daily lives and activities of individuals than before the pandemic. It could stand that levels of loneliness and depression could be lower in individuals engaging in more social media during the pandemic than those using social media before the pandemic since social media has been used to connect people during the pandemic during a time that they were unable to interact with others in-person.

Pew (2021) found that 72% of the American public use some type of social media. This use may be viewed as more integral to the daily lives of most people that use social media. This data shows that there is a large population of social media users in America and also that a good portion of social media users have visited their respective social media sites daily. There could be a difference in the level of loneliness experienced while on social media compared to prior research as social media use is integrated more into daily life. While Pew reports that the use of social media by US adults has been relatively stable for the last 5 years, there still has been growth, more so for YouTube and Reddit. Social media use during the COVID-19 pandemic could show lower levels of social isolation and depression while engaging in social media. It is interesting to explore how social media can allow for connections between people but can also have drawbacks to connecting via social media vs having social interactions with people in real life (IRL). Pew also found that while not many people seem to have a positive view of social media's effects, those who hold a positive view say these sites help people stay informed and aware (25%) and about one-in-ten say they allow for communication, connection and community-building (12%). This may show that one's intent with social media may have weight in how social media use affects the person using it and would be good to keep in mind for future research on how intentions on social media may influence how social media affects the user.

While social media use can affect mental health, there has been some cloudiness in prior research regarding the way in which we conduct research on the subject. Hammad and Alqari (2018) reviewed how prior studies on social media have only shown little effect on mental health, either negatively or positively, and the authors found that the impact of social media on mental health has been arguable. Indeed, while research has been done on social media's possible effects on mental health and well-being, it has been difficult to find a strong effect (Hammad & Alqari, 2018; Berryman, Ferguson, & Negy, 2018) and there still needs further research to affirm findings. The association found in Orben and Przybylski (2019) between digital technology use and adolescent well-being is negative but small, explaining at most 0.4% of the variation in well-being. Social media variables are poor predictors of negative outcomes (Berryman et al., 2018). Due to the cross-sectional nature of this study it cannot be determined whether social media causes negative mental health outcomes, or if individuals experiencing greater depression, anxiety and social isolation turn to social media more than others, or if some third variable might explain both (Hammad & Alqari, 2018). This fact shows how while there has been research on social media use

and its correlations with factors such as depression and anxiety, there are still some limitations to figuring out social media's true role and influence on the mental health of social media users. Ivie et al. (2020) notes that one possibility that is difficult to rule out based on correlational design is that the association could be epiphenomenal. For example, it could be that there is a common risk factor (e.g. temperament, gender) that results in both greater use of social media and higher levels of depressive symptoms, but that there is no causal relationship between social media use per se.

Negative factors of social media use

Social media research has had some contradictions in results for the outcomes associated with social media use and mental health aspects. There have been negative outcomes observed with social media use including when there is social comparison and fear of missing out involved with social media use. Researchers generally agree that certain groups of users are at more risk of experiencing negative outcomes of social media use (Marttila, Koivula, & Rasanen, 2020) There are also risks associated with specific social media activities such as cybercrime. Cybercrime is used to describe a plethora of criminal phenomena, ranging from individual-level victimization to large-scale, society-wide operations. It is illegal activity and harms others online. In addition to cybercrime there is also cyberbullying, which is differentiated from traditional bullying. The major difference between cyberbullying and traditional bullying is that while victims of traditional bullying know their harassers, cyber victims may not. There is a veil of anonymity that can be in place for the participants of cyberbullying. Cyberbullying involves an intentional act online to harm, embarrass, and/or humiliate another person. This term is also described as deliberate and aggressive. (Qudah et al., 2020). Cyberbullying can occur anytime from anyone as an individual is accessible online as long as they are online.

Online dating has also been viewed in some research to potentially be problematic for individuals. Explored negative aspects of online dating were its addictive potential, related impulsive behaviors, and its association with sex addiction and social anxiety. (Harren, Walburg, & Chabrol, 2021). There has been a need for more research on body image and self-esteem with social media use, including looking at sexually objectifying media and social media use. While pornography online has had some positive aspects seen in prior research (Attwood et al., 2019), we do also see some association with risky sexual activity, negative financial, legal, occupational, interpersonal, and individual repercussions (Harren et al., 2021). There can be negative impacts seen on body perception, sexual wellbeing, and sexual health with online media use.

Body ideals are implemented in social media use such as having ideals for a “thin” body or a “fit” body. Research has seen that these ideals can be almost unreachable societal standards that are viewed on social media sites such as Instagram.

Problematic social media use

When examining how people utilize social media, prior research has focused on problematic social media use to examine effects on happiness and mental quality of life. Problematic social media use, a term that is sometimes interchangeably used with social media addiction or social media overuse, currently does not have a consensus in its definition among researchers. According to Lin et al. (2020) patterns of ‘problematic’ use have been shown to increase depression and anxiety symptoms and affect a user’s psychological state through emotional contagion which means that emotional states are being involuntarily transmitted between individuals. Problematic social media use has also been described as a habitual pattern of excessive use of social media platforms (Marttila et al., 2020). Marttila et al.’s study utilized an adaptation of the Compulsive Internet Use Scale (CIUS) to examine intensities of problematic social media use. This concept has also been linked to cybercrime victimization experiences. The Marttila et al. (2020) study explored how an individual’s lifestyle and problematic social media use online can expose them to situations that increase the probability of victimization specifically with cybercrime. How social media is used seems to correlate with the individual’s experience online and can point to more negative experiences if there is problematic social media use.

Alongside reducing the problematic social media use there is also a need to improve generalized trust and perceived social support. It is not just the problematic use of social media that has importance regarding mental health, but also how well the individual does with generalized trust and perceived social support. Lin et al. (2021) found that problematic social media use had negative effects on happiness and quality of life but also had an increase in anxiety and depression. The effects in this study were mediated by perceived social support (perceptions of the extent to which individuals from one’s social network are available to provide social support) and generalized trust (a willingness to be vulnerable to the actions of others), such that as social support and trust increased, mental quality of life increased. For every one-point score increase by individuals on the Bergen Social Media Addiction Scale (BSMAS), the individual directly had a 0.090 lower point score in happiness and indirectly had a 0.041 lower point score in happiness via generalized trust, and a 0.163 lower point score in happiness via Perceived Social Support. Generalized trust had small to large effects on mental health, and perceived social support had medium to large effects on mental health. The problematic social media effects on happiness included direct effects and indirect effects via both generalized trust and perceived social support.

Rather than examining the social media sites visited or how long an individual uses social media, it is important to examine how individuals use social media. Berryman, Ferguson, and Negy (2018) discuss that the possible negative effects of social media may come from the quality of social media use and that this is more crucial than the quantity of social media use. It may be more interesting to see how people use social media and how that can affect a person's well-being, especially when examining social media use during the COVID-19 pandemic. This idea was not explored in the present study but could be a point of interest in the growing research on social media and mental health.

Problematic internet use and loneliness may be important risk factors for mental health problems during the COVID-19 pandemic and the two factors were associated together with predictors of loneliness (Alheneidi et al., 2021). Results from Alheneidi et al. (2021) also found that the quality of the relationship with the person the participant spent their lock-down with was also correlated with loneliness. Social media use, problematic or generally, may not be the only factor that can influence feelings of loneliness during the COVID-19 pandemic. Stress related to the COVID-19 pandemic and schooling and peer relationships were also important underlying factors as seen in the Ellis et al. (2020) study that examined Canadian adolescents stress relating to the pandemic. COVID-19 stress was related to more loneliness and more depression, especially for adolescents who spend more time on social media.

While Hammad and Alqarni (2021) found that exposure to misinformation via social media has a significant positive relationship with anxiety, depression, and social isolation, Yang, Liu, Li, and Shu (2020) found that sharing timely, accurate, and positive COVID-19 information, reducing excessive discussions on COVID-19, and promoting caring online interactions rather than being judgmental, might positively associate with the general public's psychological well-being. The difference in these studies is the effect of misinformation versus positive and accurate COVID-19 information. This is important as Yang et al. (2020) looked at how positive information rather than misinformation or negative social media use can have positive effects. Yang et al. (2020) also found that people who held positive feelings toward social media interactions tended to have lower levels of depression and anxiety.

Some prior research on social media has focused on the individual's characteristics to find if a person is predisposed to use more social media because of a factor of themselves such as social media use being associated with lower self-esteem (Srivastava, et al., 2019). Srivastava, et al. (2019) examined participants' use of Facebook and found that narcissism significantly positively predicts the personal importance placed on Facebook, emotional attachment to Facebook, the requirement for admiration by Facebook friends, and intentions to post digitally altered images of the self on Facebook. The study also found immense benefits for social media users if social media were to be used with discretion.

However, the way social media has also been used to spread misinformation on COVID-19 has also taken a toll on people's emotional resources (Zaidi & Ali, 2020). Zaidi and Ali (2020) have reviewed

the way social awareness campaigns can be double-edged swords as media coverage of the pandemic can take its toll on the consumer. People can get exhausted by the imagery in media coverage (mass graves, emotional stories, medics working long hours) and this can and has had a huge psychological cost to mental health. This study shows an important factor that while social media is a way to connect friends, family, and strangers, it is also capable of showing so much information (particularly negative imagery revolving around the COVID-19 pandemic in this case) that negative mental health effects could be occurring. If just virtually connecting with friends and family there may be a better likelihood of less depression and less social isolation, but if one's social feed is just for viewing negative imagery and misinformation, there could be more negative mental health effects as stress and concerns arise and emotional resources are exhausted. It is important to recognize that most social media use may not be simply all negative imagery or all positivity.

Positive outcomes of social media use

While misinformation and negative social media use is still a concern when engaging in social media, there are not only negatives to using social media. Sumner, Bowen, and Bartholow (2020) presents that a knowledge of factors affecting dissemination of positive mental health messages may aid organizations and individuals seeking to promote such messages online. The study showed that social media has the potential to assist with help-seeking and other health behaviors if there is positive messaging, specifically about mental health. Social learning theory shows that behavior is, in part, learned through environment, observation, and social interaction and that could include social media or rather social media can be used to incite the interactions which could affirm behaviors. Several studies have demonstrated that social media use may produce positive outcomes, such as increased life satisfaction, social trust, and political participation (Martilla et al., 2020). Positive help-seeking behaviors could be reinforced through social media. If an individual is receiving positive messaging on social media there could be more benefits than someone who is primarily engaged in problematic social media use. Yap et al. (2019) discusses message appeals and how mental health positivity can be spread effectively on social media and could reduce stigma against mental health. YouTube videos on depression and anxiety and stigma reduction were analyzed in the study and the results suggested that mental health promotion messages engage with a larger audience as they have a positive impact on the number of shares. On the same idea of learning through the messaging on social media, there is still the opportunity of negative messaging to have similar effects such as how Srivastava et al. (2019) found that there is possibly an attempt to "normalize" self-harm and suicide in certain content that has potential for the actions one is exposed to then be replicated.

There has been some prior research that has found benefits to engaging in social media when utilized correctly both by the poster and the media consumer as well as by mental healthcare professionals and users. Social media use in mental healthcare and for mental healthcare could be beneficial to use for concerns regarding mental health such as stigmas around mental illness and therapy (Robinson et al., 2019; O'Reilly et al., 2019; Martini et al., 2018; Naslund et al., 2019), research (Sanchez et al. 2020), and inferences regarding mental health states (Kolliakou et al., 2020). This is important to recognize the potential in social media to be a positive place rather than one associated with negative or problematic social media use.

Social media use and mental health promotions

Using social media methods, such as promoting mental health and encouraging social media users to seek help if they are experiencing issues, could help enhance earlier help-seeking behaviors and reduce stigmas of mental illnesses. Martini et al. (2018) article explored how information on mental health promotions is delivered through multiple platforms while analyzing BuzzFeed's Mental Health Week interactions on its website and social media platforms. Martini et al. (2018) found that videos on YouTube may be an important channel for information regarding mental health and treatment, especially when it includes personal experiences, some humor, and detailed information about treatment. Similarly, Naslund et al. (2019) explore possibilities for positive use of social media as a channel for information on mental health. Naslund et al. (2019) surveyed participants who identified that they had a mental health condition and assessed their use of social media for mental health and interest in accessing mental health programs delivered via social media. Most participants expressed interest in mental health programs delivered through social media, especially to promote health and wellbeing and for coping with mental health symptoms. This also demonstrated the feasibility of reaching social media users with mental illness to inform efforts to leverage social media to make mental health services more widely available to those in need. Naslund et al. (2019) finds that there is a potential for social media to expand the reach and availability of mental health services to those in need and that social media programs designed to help people with mental illness could appeal to a wide age demographic based on the age groups in their study not differing in their interest in mental health programs and using social media for mental health purposes. Szlyk et al. (2020) looked into the barriers for individuals with depression to seek treatment and found that online platforms like social media are effective mediums to recruit individuals with depression symptoms who seek mental health support, this is in agreement with ideas expressed in Naslund et al. (2019). Some strategies from Szlyk et al. (2020) using social media to reduce barriers that individuals

with depression encounter include engagement strategies for help-seeking behaviors, and promising platforms to recruit individuals with depression symptoms who want mental health support.

An increasing amount of attention is being paid to the ways in which individuals' mental health status can be inferred from material on social media and predicted from previous materials. The Kolliakou et al. (2020) article found a temporal association between Twitter users' posts regarding mental health-related social media content and crisis episodes in mental healthcare and that higher volumes of depression and schizophrenia tweets were associated with higher number of same-day crisis episodes for both sites. Berryman et al. (2018) examined what they called "vaguebooking" which is defined as when someone makes a social media post that contains little actual and clear information but are worded in such a way as to solicit attention and concern from the readers. This concept of "vaguebooking" was considered as a possible "cry for help" by Berryman et al. and they explain that this could serve as a warning behavior for individuals experiencing mental health issues. This is similar to the ideas discussed in Kolliaku et al. (2020) that the way individuals use social media and what they post can be useful for inferring the mental health status or predisposition of mental health concerns. Similarly, Thorstad and Wolff (2019) investigated people's everyday language on the social media platform, Reddit, to see if there are sufficient signals to predict the future occurrence of mental illness. Thorstad and Wolff (2019) found that words derived from the nonclinical subreddits predicted future postings to clinical subreddits, implying that everyday language contains signals about the likelihood of future mental illness, possibly before people are aware of their mental health condition. Posts within these subreddits can help identify individuals who likely have a clinical disorder just from everyday language as symptoms of depression tend to spill over into language. While these are just possibilities, they are worth noting as a possibility of social media to be a helpful indicator of mental health status rather than social media being a cause of mental health effects.

The use of online social media and virtual worlds is also beginning to be explored. Paul, Mohanty, and Sengupta (2022) identify a novel coping strategy to strengthen individuals' psychological resilience against the pandemic using an out-of-body experience through a social virtual world where participants projected themselves onto a virtual character in a world where they can feel immune to the COVID-19 virus. The social virtual world is defined as different from the gaming virtual world or social media use, but it still stands to show how there can be an online social platform that provides benefits to the person utilizing the virtual experience and computer-based technology as intervention tools.

Social media use and mental health stigma

Effective campaigns targeting mental health stigma in changing perceptions are complex and prior research found that social media may be used to assess stigma levels and highlight new trends (Robinson et al., 2019; O'Reilly et al., 2019). While Robinson et al. (2019) pointed out the mental health stigmas exist and are common on social media, they also found that targeting anti-stigma campaigns to individuals' profiles may prove useful to educate and change attitudes towards mental health conditions and social media could be used to measure the general public's attitudes towards mental health conditions as well. O'Reilly et al. (2019) also found the potential for social media to promote positive mental health but also examined the way perceptions of social media are possibly used to leverage mental health promotion among adolescents. This article identified that adolescents frequently utilize social media and the internet to seek out information on mental health and despite the challenges and risks of using social media, there is the possibility of social media offering a useful way to educate and provide anonymity for those seeking information on mental health but are still cautious of seeking help because of stigma or the belief of social media contributing to mental illness.

The belief of social media contributing to mental illness is important, as this effect has been seen in prior research on social media, but is beginning to lessen as focus shifts to possible positives. Social media is beginning to be seen as potentially helpful for mental health research (Sanchez et al. 2020). Sanchez et al. (2020) explain that social media could be an effective and economical recruitment tool for research for mental health although there are some methodological and privacy concerns that are not covered in current research regulations. Robinson et al. (2019) also agree on the potential for social media to be used for measuring the general public's attitudes to mental health conditions and show how useful social media could be for studying and gathering data for mental health. Social media could become a tool to survey perceptions of mental health and stigma. While there is additional consideration required for the use of social media for researchers as expressed by Sanchez et al. (2020), it shows that social media is becoming more in focus for mental health research and not just for the mental health of its users.

One of the benefits of using social media to promote mental health is the factor of anonymity. The O'Reilly et al. (2019) study helps to remind us that there can be positive effects from social media use that need more exploration to utilize it effectively and that these positive aspects should be recognized as well to have an open mind that social media could be associated with positive mental health outcomes such as lower levels of depression and loneliness. The study acknowledged the risks and challenges associated with this goal, but also recognized that social media is already used by adolescents to seek information on mental health. From the Ivie et al. (2020) study, it is thought that there could be potential benefits of social media use in adolescence that could be better self-esteem and perceived social support.

Age differences in social media use

Some research on social media use seems to focus on the concerns of developing teens/young adults and their social media use, but as we move forward, all adults' use of social media could have differing effects than that of developing teenagers/young adults and it could be useful in future research to include older individuals in the data and see how their use of social media could relate or differ from, that of adolescents. Berryman et al. (2018) states that social media use is an important developmental process for youth and young adults as they interact with others and present their forming identities online. Ivie, Pettitt, Moses, and Allen (2020) found a small but significant positive correlation between adolescent social media use and depressive symptoms but also suggest, based on the correlational design employed in the research, that the association could be epiphenomenal. It is important to note that there may be different effects among different age groups. While Ivie et al. (2020) studied depressive symptoms among adolescents who used social media, this same relationship may not exist in a general population or other age groups.

Hypotheses

This study examined if social media use during the pandemic has resulted in any changes in the correlation between social media use and loneliness, depression, anxiety, and stress. Our hypotheses were: 1. Social media use during the pandemic may show correlations with less reported loneliness rates than social media use before the pandemic, 2. Social media use during the pandemic may show correlations with less reported depression than social media use before the pandemic, 3. Social media use during the pandemic may show correlations with less reported anxiety than social media use before the pandemic, and 4. Social media use during the pandemic may show correlations with less reported stress than social media use before the pandemic. From prior research, we did recognize that anxiety and stress levels may increase during the pandemic as prior research during the pandemic has found that misinformation regarding the pandemic, imagery relating to the pandemic, and seeing the state of healthcare workers is more likely to be found and spread online and this could be reason for these two factors to increase. However, I was interested in seeing if social media use is turned to during the time of the pandemic in order to relieve these feelings rather than experience more.

CHAPTER 2

METHOD

Participants

Participants (N=270; 76 males, 190 females) included undergraduate students from Georgia Southern University (N = 249, 92.2%) and people who accessed the link to the Qualtrics survey via social media links posted on Twitter (1.1%), Facebook (3.0%). Some participants reported hearing about the survey through another unspecified source (0.4%). Participants indicated in the survey that they engaged in some use of social media via the amount of time they spent on social media sites.

Ages ranged from 18 to 60 years old. The majority of participants ranged from 18 to 20 years of age (68.2%), and 13% of participants did not indicate their age. The majority of participants identified as white (62.6%), but the sample also included African American (28.5%), Asian/Asian-American (4.8%), Mexican American (4.8%), American Indian (.4%), and multiracial (5.9%) individuals. Participants' relationship statuses were mostly single (78.9%) compared to married/partnered/common law (14.8%), never married (4.1%), separated (0.4%), and divorced (0.7%), widowed (0.7%). Participants were mostly from urban areas (51.5%) compared to rural areas (46.7%), some did not respond (1.9%). Participants identified their current financial status with most indicating having some financial resources (55.9%) or substantial resources (37.8%) and a small percentage indicated they were currently poor/impoverished (4.8%) or rich/affluent (0.4%). Participants identified their highest level of formal education with the majority having some college or vocational school (55.2%) or a high school diploma/GED (34.4%). Small percentages were reported for a vocational degree (.4%), a college degree (5.6%), a master's degree (1.1%) or a doctoral degree (1.1%) Participants who did not finish the survey (N=25) or participants whose time spent on the study is less than five minutes (N=20) were excluded from the study.

Measures

The Bergen Social Networking Addiction Scale (Andreassen et al., 2016) (Appendix A) is an adaptation of the Bergen Facebook Addiction Scale (BFAS) (Andreassen, Torsheim, Brunborg, & Pallesen, 2012). The BSNAS only replaces the word "Facebook" with "social media" and "social media" is defined as "Facebook, Twitter, Instagram and the like" in the instructions. This scale uses a 5-point Likert scale ranging from 1 (very rarely) to 5 (very often), thus yielding a composite score from 6 to 30. Higher scores indicate that the individual is more at risk of developing problematic social media use. The BFAS has shown acceptable psychometric properties across studies. (Andreassen, et al., 2016). Cronbach's alpha using the BSNAS scale was .86 (Lin et al, 2021) and .88 (Andreassen et al., 2016). In

the present study, Cronbach's alpha for this scale was .74. In addition, Cronbach's alpha for pre-Covid (.84) and during-Covid (.75) conditions were acceptable.

The Depression Anxiety Stress Scale (DASS-21) (Lovibond, S. H., & Lovibond, P. F. 1995) (Appendix B) is a 21-item self-report scale, based on the original 42-item scale, which measures the negative emotional states of depression, anxiety, and stress. Each subscale has 7 items. The Depression subscale assesses symptoms such as dysphoria, hopelessness, lack of incentive, and low self-esteem. The Anxiety subscale has items that assess acute responses of fear as well as subjective and somatic symptoms of anxiety. The Stress subscale includes items that measure symptoms such as difficulty in relaxing, nervous tension, irritability, overreaction to stressful events, and impatience. Participants indicated the extent of their experiences of each state over the past week on a 4-point scale ranging from 0 (Did not apply to me at all / Never) to 4 (Applied to me very much, or most of the time / Almost Always). The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The reliability of DASS-21 showed that it has excellent Cronbach's alpha values of 0.81, 0.89 and 0.78 for the subscales of depressive, anxiety and stress respectively. (Coker et al., 2018; Antony et al., 1998) These Cronbach alpha values showed that the DASS-21 is a reliable psychometric instrument with good internal consistency. The 21-item version has been shown to have a cleaner factor structure and smaller inter-factor correlations than the longer version which was suitable for our study (Antony et al., 1998). The convergent and discriminant validity of the DASS-21 have also been evaluated with scales of positive and negative affectivity and quality of life measures such as the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The depression scale highly correlates with the Beck Depression Inventory (BDI: Beck, Rush, Shaw, & Emery, 1979) and the anxiety scale correlates highly with the Beck Anxiety Inventory (BAI; Antony et al., 1998; Bados et al., 2005; Beck & Steer, 1990; Gloster et al., 2008; Norton, 2007) and the State-Trait Anxiety Inventory (STAI; Antony et al., 1998; Spielberger, 1983; Wang et al., 2016). In the present study, coefficient alpha was .86, .80, and .80 for the depressive, anxiety, and stress subscales, respectively. In addition, Cronbach's alpha for the depressive subscale pre-Covid (.91) and during-Covid (.88) conditions, the anxiety subscale pre-Covid (.86) and during-Covid (.85) conditions, and the stress subscale pre-Covid (.84) and during-Covid (.84) conditions were all acceptable.

The UCLA Loneliness Scale (Version 3) (Russell, 1996) (Appendix C) uses a 4-point rating scale from 1 (never) to 4 (always). 1 = never; 2 = rarely; 3 = sometimes; 4 = always. The participants answered 20 questions, such as "How often do you feel left out?" and "How often do you feel part of a group of friends?" and researchers later reverse-code the positively worded items so that high values mean more loneliness, and then calculate a score for each respondent by averaging their ratings. The UCLA Loneliness Scale (version 3) is a 20-item scale designed to measure one's subjective feelings of loneliness

as well as feelings of social isolation. Results indicated that the measure was highly reliable, both in terms of internal consistency (coefficient alpha ranging from .89 to .94) and test-retest reliability over a 1-year period ($r = .73$) (Russell, 1996). Convergent validity for the scale was indicated by significant correlations with other measures of loneliness. Construct validity was supported by significant relations with measures of the adequacy of the individual's interpersonal relationships, and by correlations between loneliness and measures of health and well-being. Coefficient alpha for the UCLA Loneliness Scale in the present study was .93. In addition, Cronbach's alpha for pre-Covid (.95) and during-Covid (.93) conditions were acceptable.

Procedure

Participants were recruited using the SONA system at Georgia Southern and direct links to the survey via social media posts on Twitter, Instagram, Facebook, and Reddit. We collected information from participants through self-report questionnaires relating to their experiences on social media. Georgia Southern students who completed the study via SONA received compensation in the form of course credit. We distributed this study to others outside of Georgia Southern to gain more participants and to broaden the sample. Participants who were not students at Georgia Southern did not receive credit or any monetary compensation. Only participants that accessed the survey through SONA received course credit applied to the participant's SONA account.

All participants first completed an informed consent form. Next, participants were randomly assigned to one of two groups, the first randomly assigned group were instructed to think about their responses in the context of their social media use during the pandemic ($N = 142$). The second randomly assigned group were instructed to think about their responses in the context of their social media use before the pandemic ($N = 128$). Both groups received the same questionnaires, the only difference being the context in which they were asked to contemplate for their responses, either during the pandemic or before the pandemic, respectively.

Both randomly assigned groups were asked to indicate approximately how much time they spend on social media per day, either during the pandemic or before the pandemic, respectively (Appendix D). The participants were instructed to identify what forms of social media they use daily on a scale from 0 to 100 minutes (Appendix E). We also included questions to address directionality for loneliness, depression, anxiety, and stress so that participants could indicate whether social media use makes them feel lonely, depressed, anxious, or stressed, or if they use social media when they experience loneliness, depression, anxiety or stress (Appendix F). This was included to help to identify whether participants are using social media to alleviate these factors or if social media use is potentially adding to their loneliness,

depression, anxiety, or stress, based on participants' self-reported perspective. Examples of these directionality questions include "When using social media, do you experience feelings of loneliness?" or "When you feel lonely do you use social media to reduce these feelings?"

Finally, participants in both randomly assigned groups were given the Bergen Social Media Addiction Scale, the Social Media Use Integration Scale, the DASS-21, and the UCLA Loneliness Scale (Version 3). The Bergen Social Media Addiction Scale was used to examine the risk of developing problematic social media use. The DASS-21 was used to examine feelings of depression, anxiety, and stress levels. Finally, the UCLA Loneliness Scale (Version 3) was used to examine the levels of loneliness. Each group was prompted to respond while thinking about their experience with social media during the pandemic or before the pandemic. Included in the instructions for each individual questionnaire was a reminder of their prompt (during or before the pandemic) to ensure participants were thinking about their social media use in the assigned time period.

We collected demographic data through self-report questions at the end of the survey to collect information on participants' age, sexual identity, gender, race, relationship status, hometown, current town, financial resource status, and level of education.

CHAPTER 3
RESULTS

Time Spent on Social Media

Analyses began by examining the overall estimates of time people devoted to social media each day. We identified the amount of time spent by participants on social media to be an average of 2.7 hours per day before the pandemic and the time spent on social media during the pandemic was identified as an average of 3.45 hours. A comparison of the daily hours spent on social media in the pre-pandemic and during-pandemic groups showed that people reported fewer hours devoted to social media before the pandemic ($M=2.7, SD=.935$) than during the pandemic ($M=3.45, SD=.795$), $t(268)=-7.170, p=.004$.

Participants were asked to identify the amount of time in minutes that were spent on specific social media sites daily. These are presented in Table 1.

Table 1

Minutes Spent Daily on Social Media Sites				
Variable	Pre-	During	<i>t</i>	Sig.
Facebook	10.8	20.9	-3.223	.001*
Twitter	10.64	18.4	-2.346	.020
Instagram	45.2	53.9	-2.489	.013
Snapchat	47.3	58.4	-2.473	.014
WeChat	0.0	0.1	-0.865	.387
GroupMe	3.2	5.9	-2.215	.028
Tik Tok	43.4	75.3	-7.127	.0001*
Other	10.6	23.2	-3.352	.001*

* $p < .00625$

Note. Table 1 shows a longer amount of time spent on social media sites consistently for each listed site when comparing the means for each in the during group compared to the means found in the pre-pandemic group. To account for type I error, we used Bonferroni-corrected p value of .00625 to determine significance. Twitter, Instagram, Snapchat, WeChat, and GroupMe had no significant difference in the minutes spent on social media during the pandemic compared to before the pandemic.

Correlations

Pearson's correlations were used in order to examine our primary hypotheses. We predicted: 1. That the correlation between social media use and loneliness would be smaller during the pandemic than before the pandemic; 2. That the correlation between social media use and depression would be smaller during the pandemic than before the pandemic; 3. That the correlation between social media use and anxiety would be lower during the pandemic than before the pandemic; and 4. That the correlation between social media use and self-reported stress would be lower during the pandemic than before the pandemic. The first phase of data analysis was conducted with correlations of the variables. Three tables were created to show zero order correlations; Table 2 reports the correlations when pre- and during-pandemic data are combined. It indicates a modest relationship between time spent on social media, and loneliness, anxiety, and stress. The correlations between these variables and depression is included here for informational purposes.

Table 2

<i>Correlations of Key Variables Across Both Conditions</i>						
Variables	M	SD	1	2	3	4
1. Hours Spent on Social Media	3.10	0.94				
2. Anxiety	11.22	4.53	0.16**			
3. Depression	12.52	5.24	0.10*	0.68**		
4. Stress	13.31	4.78	0.11*	0.83**	0.76**	
5. Loneliness	55.57	6.30	-0.16**	-0.34**	-0.52**	-0.42**

* $p < .05$; ** $p < .01$

Pre-pandemic correlations between social media and loneliness, anxiety, and stress appear in Table 3. These results indicate non-significant correlations between social media usage and each of these variables.

Table 3

<i>Correlations of Key Variables Before the Pandemic</i>						
Variables	<i>M</i>	<i>SD</i>	1	2	3	4
1. Hours Spent on Social Media	2.72	0.94				
2. Anxiety	11.01	4.62	0.08			
3. Depression	12.44	5.79	0.05	0.75**		
4. Stress	9.66	3.78	0.00	0.82**	0.77**	
5. Loneliness	2.71	0.62	-0.07	-0.51**	-0.56**	-0.53*

* $p < .05$; ** $p < .01$

Table 4 presents the correlations between hours spent on social media and loneliness, anxiety, and stress. Social media use is positively associated with each of these measures.

Table 4

<i>Correlations of Key Variables During the Pandemic</i>						
Variables	<i>M</i>	<i>SD</i>	1	2	3	4
1. Hours Spent on Social Media	3.45	0.8				
2. Anxiety	11.41	4.45	0.23*			
3. Depression	12.60	4.70	0.19*	0.59*		
4. Stress	13.53	4.69	0.17**	0.81*	0.71*	
5. Loneliness	2.61	0.56	-0.21**	-0.18**	-0.49*	-0.30*

* $p < .05$; ** $p < .01$

In order to test hypothesis 1, that the correlations between social media use and loneliness would decrease in magnitude pre- vs during-pandemic, a Fisher's r-to-z transformation was conducted. This was conducted by transforming the correlations to z scores via an online calculator (Weiss, 2010). Results indicate that the magnitude of the correlation between social media use and loneliness did not decrease during the pandemic, $z = -1.960$, as the critical value of z in this one-tailed test is -1.645 . In fact, the correlation reported before the pandemic, $r = -0.07$, was actually lower than that reported during the pandemic, $r = -0.21$, which was inconsistent with our proposed hypothesis.

A similar test was conducted in order to test hypothesis 2 comparing the correlation between social media use and depression before the pandemic, $r = 0.047$, and during the pandemic, $r = 0.185$. Results again indicate that the magnitude of the correlation between social media use and depression did not decrease during the pandemic, $z = 1.137$.

The third hypothesis that the correlation between social media use and anxiety would decrease during the pandemic also was tested using the r to z transformation. Results of this analysis indicated that the correlation between these two variables before the pandemic, $r = 0.083$, did not decrease during the pandemic, $r = 0.228$, $z = 1.208$.

A test of the fourth hypothesis that the correlation between social media use and stress would decrease during the pandemic demonstrated a similar pattern. Social media use before the pandemic showed no correlation with stress, $r = 0.004$, which increased during the pandemic to $r = 0.17$. The Fisher's r to z transformation of these values was not significant, $z = 1.36$.

Regression Analyses

An alternative method for testing the four major hypotheses is to use linear regression for exploratory analyses. In order to do this, the hours spent on social media per day served as the criterion, and Timing (pre- vs. during- the pandemic), Anxiety, and the Timing X Anxiety interaction served as predictors (Appendix G). Results of this analysis showed the predictors accounted for 18.1% of the variance ($R^2 = .181$, $F(3,265) = 19.50$, $p < .001$). It was found that anxiety significantly predicted use of social media ($\beta = .14$, $p = .016$). Neither the Time nor the Anxiety X Time interaction predicted the hours spent on social media. The hours spent on social media per day served as the criterion, and Timing (pre- vs. during- the pandemic), Depression, and the Timing X Depression interaction served as predictors (Appendix H). Results of this analysis showed the predictors accounted for 17.1% of the variance ($R^2 = .171$, $F(3,263) = 18.14$, $p < .001$). It was found that depression did not significantly predict use of social media ($\beta = .01$, $p = .11$). Neither the Time nor the Depression X Time interaction predicted the hours spent on social media. The hours spent on social media per day served as the criterion, and Timing (pre- vs. during- the pandemic), Stress, and the Timing X Stress interaction served as predictors (Appendix I). Results of this analysis showed the predictors accounted for 17.4% of the variance ($R^2 = .174$, $F(3,263) = 18.50$, $p < .001$). It was found that stress did not significantly predict use of social media ($\beta = .16$, $p = .11$). Neither the Time nor the Stress X Time interaction predicted the hours spent on social media. The hours spent on social media per day served as the criterion, and Timing (pre- vs. during- the pandemic), Loneliness, and the Timing X Loneliness interaction served as predictors (Appendix J). Results of this analysis showed the predictors accounted for 17.5% of the variance ($R^2 = .175$, $F(3) = 18.57$, $p < .001$).

It was found that loneliness did not significantly predict use of social media ($\beta = -.130, p = .21$). The Loneliness X Time interaction did not predict the hours spent on social media.

Directionality

In order to try to understand people's use of social media as a means to deal with mental health concerns, we asked participants how likely they are to use social media in order to deal with feelings of loneliness, stress, anxiety, or depression. These responses were analyzed with a series of t tests comparing participants recalling their use of social media before the pandemic with those recalling their use during the pandemic. The results of these tests showed no significant differences in these estimates for anxiety pre-pandemic ($M=3.26, SD = 0.96$) vs. during the pandemic ($M=3.37, SD=1.00$), $t(255) = -.92, p = .369$. A similar test of people's use of social media showed no difference in loneliness pre-pandemic ($M=3.46, SD=0.99$) versus during the pandemic ($M=3.65, SD=0.86$), $t(255) = 1.61, p = .007$. Likewise, participants did not deal with depression pre-pandemic ($M=3.14, SD=1.02$) differently from during the pandemic ($M=3.32, SD=1.06$), $t(246) = 1.42, p = .483$, in their use of social media. And, finally, participants did not use social media in order to deal with stress pre-pandemic ($M=3.36, SD=1.00$) more or less than they did during the pandemic ($M=3.47, SD= 0.98$), $t(252) = 0.85, p = .455$. These results reflect the participants' self-reflection on their social media use. Participants assessed their own use of social media and feelings in their answers to these directionality questions.

Social Media Addiction

Each group was also examined for the possibility of developing problematic social media use and that was analyzed with a univariate analysis in the form of a T-Test of the BSNAS data. The reported average BSNAS scores for the pre-pandemic group ($M=2.67, SD=0.94$) were not significantly lower than the scores reported during the pandemic ($M=3.07, SD=0.86$), $t(1.374) = 3.641, p < .05$. In fact, the data show an increase in the possibility of problematic social media use during the pandemic.

CHAPTER 4 DISCUSSION

We found a modest relationship between time spent on social media, and loneliness, anxiety, and stress. While we hypothesized that there could be a decrease in the correlation between loneliness, depression, anxiety, and stress, respectively, with social media use during the pandemic than before the pandemic, we did not find this to be true for any of the variables we assessed with social media use. We found that our results indicated that the correlation of loneliness and social media use was reported as lower before the pandemic than during the pandemic. Indeed, the results of our analyses indicate a trend contrary to hypotheses.

Responses to questions regarding the directionality of the relationship – that is, whether social media precedes poor mental health or is a result of poor mental health – showed no significant effects. Participants' ratings of their social media use and their feelings of loneliness, depression, anxiety, or stress did not reveal any significant differences between participants who rated themselves before the pandemic vs. those who rated themselves during the pandemic.

The potential for having a social media addiction, determined by the BSNAS in this study, did show a significant difference between pre-pandemic and during the pandemic groups. We see an increase in the scores for social media addiction in the during the pandemic group compared to the pre-pandemic group. This was an exploratory analysis to investigate the possibility that problematic social media use and social media addiction may be associated with the pandemic. This finding is based on the participants' self-reported feelings on their social media use and does not rely on participants' their actual use of social media.

Additionally, our results for minutes spent on social media sites daily showed that participants in the during the pandemic group reported longer amounts of time spent on social media sites than those reported in the pre-pandemic group. However, when comparing the results for the mean time spent on these social media sites in the during the pandemic group compared to the means found in the pre-pandemic group, FaceBook, Tik Tok, and Other sites not listed were significant while Twitter, Instagram, Snapchat, WeChat, and GroupMe had no significant difference.

Limitations

Several factors place limits on the conclusions that can be drawn from the current data. We lacked incentives for participants who accessed the survey via social media links. These participants had no incentives or compensation for their time. This could have contributed to a lower number of participants. Our study mostly consisted of Georgia Southern University students.

We also did not implement the attention check questions that were described in the proposal so the lack of these checks may have allowed participants that did not fully pay attention to the survey items to be included. The attention check questions were not included by accident on the part of the researcher when creating the survey on Qualtrics. Future studies should include the attention check questions to ensure more accurate answers.

Potential limitations arise from not randomizing the items of the questionnaires. There could be a potential order effect that was not account for in our study. All participants encountered the same questions in the same order with the only difference being whether they were instructed to reflect on social media use before the pandemic or during the pandemic, respectively.

Future studies should aim for a higher number of participants with a more diverse population to include more than primarily Georgia Southern University students. While our study did include those that accessed the study voluntarily through social media site post interaction, this relied on voluntary participation with no compensation to bring in a larger number of participants. Because previous studies have seemed to focus on concerns of developing teens and young adults, it could be useful in future studies to compare results between various ages to see if there are differing results. Our study only had a minimum age of 18 and included participants up to age 60, but there was insufficient data to allow for comparisons of different age groups.

Another limitation to this study is the nature of self-report questionnaires as these may not be the most reliable source of data. Our study relied on participants to be truthful and accurate in their responses regarding their experiences. We also relied on participants to accurately assess their feelings on social media use before the pandemic which involves self-reflection to a few years before the current study. Financial strain, health concerns, and other factors may contribute to feelings of loneliness, depression, anxiety, and stress, and these other factors might be especially problematic during a pandemic. While our study asked participants to focus on just their social media use, since we utilized self-report measures there could still be some factors unaccounted for.

Future studies could benefit from data collected before a pandemic and during the pandemic as they occur in the actual time frame, rather than relying only on self-reports from recollection of past experiences. However, it is difficult to predict when an event like a pandemic will occur to successfully collect this information. Perhaps future studies could benefit from reflecting on social media use after the pandemic subsides and compare that to data collecting during the pandemic to see if there is a change in correlations during the pandemic and after.

Conclusion

Previous studies have examined the possible benefits of social media for mental health promotions and correcting mental health stigma. Research also examined problematic social media use and exposure to misinformation. There has been a mix of findings from research on social media and mental health that have shown little effects, both positive and negative in outcomes, so it is still useful to examine social media's correlations to mental health measures. The present study investigated the possibility that the correlation between social media use and mental health measure might change due to the pandemic. This prediction was not upheld by the data. Future research may benefit from examining social media use and mental health factors through more in-depth analyses of how a person utilizes social media, rather than by examining only generalized reports of social media use. Addressing whether people use social media in a positive way (mental health resources, positive messaging) or in a negative way (exposure to misinformation, negative messaging) would be crucial to such an effort, and would represent an important improvement over the current study.

REFERENCES

- Alheneidi, H., AlSumait, L., AlSumait, D., & Smith, A. P. (2021). Loneliness and Problematic Internet Use during COVID-19 Lock-Down. *Behavioral Sciences (2076-328X)*, 11(1), 5. <https://doi.org/10.3390/bs11010005>.
- Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors*, 30(2), 252-262. <http://dx.doi.org/10.1037/adb0000160>.
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998)
- Berryman, C., Ferguson, C. J., & Negy, C. (2018). Social Media Use and Mental Health among Young Adults. *The Psychiatric Quarterly*, 89(2), 307–314. <https://doi.org/10.1007/s11126-017-9535-6>.
- Bottesi, G., Ghisi, M., Altoè, G., Conforti, E., Melli, G., & Sica, C. (2015). The Italian Version of the Depression Anxiety Stress Scales-21: Factor Structure and Psychometric Properties on Community and Clinical Samples. *Comprehensive Psychiatry*, 60, 170-181. <https://doi.org/10.1016/j.comppsy.2015.04.005>
- Dhamija, S., Chaudhury, S., & Saldanha, D. (2020). Social media during corona pandemic. *Industrial Psychiatry Journal*, 29(2), 357–359. https://doi.org/10.4103/ipj.ipj_123_20
- Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically Isolated but Socially Connected: Psychological Adjustment and Stress Among Adolescents During the Initial COVID-19 Crisis. *Canadian Journal of Behavioral Science*, 52(3), 177–187. <https://doi.org/10.1037/cbs0000215>.
- Hammad, M. A., & Alqarni, T. M. (2021). Psychosocial effects of social media on the Saudi society during the Coronavirus Disease 2019 pandemic: A cross-sectional study. *PLoS ONE*, 16(3), 1–13.
- Harren, N., Walburg, V., & Chabrol, H. (2021). Studying the Relationship of Problematic Online Dating, Social Media Use and Online Sexual Behaviors with Body Esteem and Sexuality. *Sexuality & Culture: An Interdisciplinary Journal*, 25(6), 2264–2291. <https://doi.org/10.1007/s12119-021-09876-z>.
- Ivie, E. J., Pettitt, A., Moses, L. J., & Allen, N. B. (2020). A meta-analysis of the association between adolescent social media use and depressive symptoms. *Journal of Affective Disorders*, 275, 165–174. <https://doi.org/10.1016/j.jad.2020.06.014>.
- Kolliakou, A., Bakolis, I., Chandran, D., Derczynski, L., Werbeloff, N., Osborn, D. P. J., Bontcheva, K., & Stewart, R. (2020). Mental health-related conversations on social media and crisis episodes: a time-series regression analysis. *Scientific Reports*, 10(1), 1342. <https://doi.org/10.1038/s41598-020-57835-9>.
- Lin, C., Namdar, P., Griffiths, M. D., & Pakpour, A. H. (2021). Mediated roles of generalized trust and perceived social support in the effects of problematic social media use on mental health: A cross-sectional study. *Health Expectations*, 24(1), 165–173. <https://doi.org/10.1111/hex.13169>.

- Martini, T., Czepielewski, L. S., Baldez, D. P., Gliddon, E., Kieling, C., Berk, L., Berk, M., & Kauer-Sant'Anna, M. (2018). Mental health information online: What we have learned from social media metrics in BuzzFeed's Mental Health Week. *Trends in Psychiatry and Psychotherapy*, 40(4), 326–336. <https://doi.org/10.1590/2237-6089-2018-0023>.
- Marttila, E., Koivula, A., & Räsänen, P. (2021). Cybercrime Victimization and Problematic Social Media Use: Findings from a Nationally Representative Panel Study. *American Journal of Criminal Justice: The Journal of the Southern Criminal Justice Association*, 46(6), 862–881. <https://doi.org/10.1007/s12103-021-09665-2>.
- Naslund, J. A., Aschbrenner, K. A., McHugo, G. J., Unützer, J., Marsch, L. A., & Bartels, S. J. (2019). Exploring opportunities to support mental health care using social media: A survey of social media users with mental illness. *Early Intervention in Psychiatry*, 13(3), 405–413. <https://doi.org/10.1111/eip.12496>.
- O'Reilly, M., Dogra, N., Hughes, J., Reilly, P., George, R., & Whiteman, N. (2019). Potential of social media in promoting mental health in adolescents. *Health Promotion International*, 34(5), 981–991. <https://doi.org/10.1093/heapro/day056>.
- Orben, A., Przybylski, A.K. The association between adolescent well-being and digital technology use. *Nat Hum Behav* 3, 173–182 (2019). <https://doi.org/10.1038/s41562-018-0506-1>
- Osman, A., Wong, J. L., Bagge, C. L., Freedenthal, S., Gutierrez, P. M., & Lozano, G. (2012). The Depression Anxiety Stress Scales-21 (DASS-21): Further Examination of Dimensions, Scale Reliability, and Correlates. *Journal of Clinical Psychology*, 68, 1322-1338. <https://doi.org/10.1002/jclp.21908>.
- Paul I., Mohanty S., Sengupta R., 2022, The role of social virtual world in increasing psychological resilience during the on-going COVID-19 pandemic, *Computers in Human Behavior*, 127, <https://doi.org/10.1016/j.chb.2021.107036>.
- Pew Research Center. Retrieved from <https://www.pewresearch.org/internet/fact-sheet/social-media/>
- Ramírez-Ortiz, J., Castro-Quintero, D., Lerma-Córdoba, C., Yela-Ceballos, F., & Escobar-Córdoba, F. (2020). Mental health consequences of the COVID-19 pandemic associated with social isolation. *Colombian Journal of Anesthesiology / Revista Colombiana de Anestesiología*, 48(4), 1–7. <https://doi.org/10.5554/22562087.e930>.
- Robinson, P., Turk, D., Jilka, S., & Cella, M. (2019). Measuring attitudes towards mental health using social media: investigating stigma and trivialisation. *Social Psychiatry & Psychiatric Epidemiology*, 54(1), 51–58. <https://doi.org/10.1007/s00127-018-1571-5>.
- Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of personality assessment*, 66(1), 20-40.
- Russell, D., Peplau, L.A., & Cutrona, C.E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39, 472-480.
- Sanchez, C., Grzenda, A., Varias, A., Widge, A. S., Carpenter, L. L., McDonald, W. M., Nemeroff, C. B., Kalin, N. H., Martin, G., Tohen, M., Filippou-Frye, M., Ramsey, D., Linos, E., Mangurian, C., & Rodriguez, C. I. (2020). Social media recruitment for mental health research: A systematic

- review. *Comprehensive Psychiatry*, 103, 152197.
<https://doi.org/10.1016/j.comppsy.2020.152197>
- Sumner, S. A., Bowen, D. A., & Bartholow, B. (2020). Factors associated with increased dissemination of positive mental health messaging on social media. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 41(2), 141–145. <https://doi.org/10.1027/0227-5910/a000598> (Supplemental).
- Szlyk, H., Deng, J., Xu, C., Krauss, M. J., Cavazos, R. P. A., & Cavazos-Rehg, P. A. (2020). Leveraging social media to explore the barriers to treatment among individuals with depressive symptoms. *Depression & Anxiety (1091-4269)*, 37(5), 458–465. <https://doi.org/10.1002/da.22990>
- Thorstad, R., & Wolff, P. (2019). Predicting future mental illness from social media: A big-data approach. *Behavior Research Methods*, 51(4), 1586–1600. <https://doi.org/10.3758/s13428-019-01235-z>
- Valdez, D., Ten Thij, M., Bathina, K., Rutter, L. A., & Bollen, J. (2020). Social Media Insights Into US Mental Health During the COVID-19 Pandemic: Longitudinal Analysis of Twitter Data. *Journal of Medical Internet Research*, 22(12), e21418. <https://doi.org/10.2196/21418>.
- Weiss, B. A. (2010). Fisher's Z Transformation. Accessed March 24, 2022.
<https://blogs.gwu.edu/weissba/teaching/calculators/fishers-z-transformation/>
- Yang, Y., Liu, K., Li, S., & Shu, M. (2020). Social Media Activities, Emotion Regulation Strategies, and Their Interactions on People's Mental Health in COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 17(23). <https://doi.org/10.3390/ijerph17238931>.
- Zaidi, A., & Ali, A. Z. (2020). Living under the shadow of a pandemic: The psychological challenges underlying social distancing and awareness raising. *Psychological Trauma: Theory, Research, Practice and Policy*, 12(5), 508–510. <https://doi.org/10.1037/tra0000815>.

APPENDIX A

BERGEN SOCIAL NETWORKING ADDICTION SCALE

Instruction: Below you will find some questions about your relationship to and use of social media (Facebook, Twitter, Instagram, and the like). Choose the response alternative for each question that best describes you.

How often during the last year have you...

	Very Rarely	Rarely	Sometimes	Often	Very Often
... spent a lot of time thinking about social media or planned use of social media?					
... felt an urge to use social media more and more?					
... used social media in order to forget about personal problems?					
... tried to cut down on the use of social media without success?					
... become restless or troubled if you have been prohibited from using social media?					
... used social media so much that it has had a negative impact on your job/studies?					

All items scored on the following scale: 1 (Very rarely), 2 (Rarely), 3 (Sometimes), 4 (Often), 5 (Very Often).

APPENDIX B

DEPRESSION, ANXIETY, AND STRESS SCALE-21

Please read each statement and select a number 0, 1, 2, or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree or a good part of the time

3 Applied to me very much or most of the time

1(s)	I found it hard to wind down
2(a)	I was aware of dryness of my mouth
3(d)	I couldn't seem to experience any positive feeling at all
4(a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)
5(d)	I found it difficult to work up the initiative to do things
6(s)	I tended to over-react to situations
7(a)	I experienced trembling (e.g. in the hands)
8(s)	I felt that I was using a lot of nervous energy
9(a)	I was worried about situations in which I might panic and make a fool of myself
10(d)	I felt that I had nothing to look forward to
11(s)	I found myself agitated
12(s)	I found it difficult to relax
13(d)	I felt down-hearted and blue
14(s)	I was intolerant of anything that kept me from getting on with what I was doing
15(a)	I felt I was close to panic
16(d)	I was unable to become enthusiastic about anything
17(d)	I felt I wasn't worth much as a person
18(s)	I felt that I was rather touchy

19(a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)
20(a)	I felt scared without any good reason
21(d)	I felt life was meaningless

a Anxiety Subscale. d Depression subscale. s Stress subscale.

APPENDIX D

GENERAL AMOUNT OF TIME SPENT ON SOCIAL MEDIA

How many hours do you spend on social media per day?

- 0-1 hours
- 1-3 hours
- 3-5 hours
- 5 or more hours.

APPENDIX E

TIME SPENT ON SPECIFIC SOCIAL MEDIA SITES

Please identify the amount of minutes, if any, that you spend on these social media sites on a daily basis.

<input type="checkbox"/> Facebook	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> Twitter	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> Instagram	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> Snapchat	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> WeChat	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> GroupMe	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> TikTok	0	10	20	30	40	50	60	70	80	90	100	120+
<input type="checkbox"/> Other	0	10	20	30	40	50	60	70	80	90	100	120+

APPENDIX F
DIRECTIONALITY

Item	Questions	Never	Rarely	Sometimes	Always
1	When you feel <i>lonely</i> do you use social media to reduce these feelings?				
2	When you feel <i>anxious</i> do you use social media to reduce these feelings?				
3	When you feel <i>depressed</i> do you use social media to reduce these feelings?				
4	When you feel <i>stressed</i> do you use social media to reduce these feelings?				

APPENDIX G
REGRESSION ANXIETY

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.425 ^a	.181	.172	.85681

a. Predictors: (Constant), Anx_x_PreDuring, Anxiety Overall, Grouping

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	42.943	3	14.314	19.498	.000 ^b
Residual	194.544	265	.734		
Total	237.487	268			

a. Dependent Variable: Hours_Spent_Overall

b. Predictors: (Constant), Anx_x_PreDuring, Anxiety Overall, Grouping

Coefficients

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	2.759	.140		19.674	.000
Grouping	-.230	.140	-.244	-1.639	.102
Anxiety_Overall	.028	.012	.135	2.420	.016
Anx_x_PreDuring	-.013	.012	-.161	-1.078	.282

a. Dependent Variable: Hours_Spent_Overall

APPENDIX H
REGRESSION DEPRESSION

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.414 ^a	.171	.162	.86349

a. Predictors: (Constant), Depress_x_PreDuring, Depression_Overall, Grouping

ANOVAS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	40.564	3	13.521	18.135	.000b
Residual	196.095	236	.746		
Total	263.659	266			

a. Dependent Variable: Hours_Spent_Overall

b. Predictors: (Constant), Depress_x_PreDuring, Depression_Overall, Grouping

Coefficients

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	2.837	.139		20.403	.000
Depression_Overall	.019	.010	.105	1.853	.065
Grouping	-.222	.139	-.236	-1.598	.111
Depress_x_PreDuring	-.012	.010	-.174	-1.180	.239

a. Dependent Variable: Hours_Spent_Overall

APPENDIX I

REGRESSION STRESS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.417 ^a	.174	.165	.86050

a. Predictors: (Constant), Stress_x_PreDuring, Stress Overall, Grouping

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	41.101	3	13.700	18.503	.000 ^b
Residual	194.741	263	.740		
Total	235.843	266			

a. Dependent Variable: Hours_Spent_Overall

b. Predictors: (Constant), Stress_X_Pre During, Stress Overall, Grouping

Coefficients

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	2.831	.157		17.977	.000
Grouping	-.214	.157	-.227	-1.358	.176
Stress_Overall	.018	.011	.091	1.622	.106
Stress_x_Pre During	-.012	.011	-.182	-1.086	.279

a. Dependent Variable: Hours_Spent_Overall

APPENDIX J
REGRESSION LONELINESS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.418	.175	.165	.85955

a. Predictors: (Constant), Lonely_x_PreDuring, Loneliness Overall, Grouping

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	41.155	3	113.718	18.568	.000
Residual	194.313	263	.739		
Total	235.468	266			

a. Dependent Variable: Hours_Spent_Overall

b. Predictors: (Constant), Lonely_x_PreDuring, Loneliness Overall, Grouping

Coefficients

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	3,626	.245		14.804	.000
Grouping	-.615	.245	-.654	-2.510	.013
Loneliness Overall	-.208	.090	-.130	-2.316	.021
Lonely_x_Pre During	.096	.090	.278	1.068	.287

a. Dependent Variable: Hours_Spent_Overall