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## Social Media Usage during COVID-19: Friend or Foe?

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# **Social Media Usage During COVID-19: Friend or Foe?**



Honors Thesis

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Department: Psychology

Advisor: Melissa Layman-Guadalupe, PhD

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## Abstract

College students experience more stress and are more vulnerable to mental illness as compared to the general population. Both COVID-19 and social media usage have shown to be stressors that augment this pre-existing issue. The goal of the current study is to highlight the relationship between the social media usage and mental health of college students during the COVID-19 pandemic. Utilizing a correlational and longitudinal research design, undergraduate students completed self-report mental health and social media usage measures throughout the semester. Researchers found that both social media usage, anxiety, and depression levels were higher post-pandemic as compared to pre-pandemic. However, analyses also showed that social media usage was not a significant factor in the self-reported mental health levels of college students at the end of the semester. Future research should continue to study this relationship so we can gain a better understanding of the psychological effects of the COVID-19 pandemic. In addition, Universities need to take the increase in mental health concerns on their campuses seriously and provide necessary support and resources for their students.

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## **Introduction**

College is an inherently stressful time for individuals emerging to early adulthood and can leave them vulnerable to a wide variety of mental health challenges. New experiences, peer pressure, adapting to living situations, relationships, and exploration of various identities are just some of the stressors that college students face. In addition to this combination of factors, late adolescence and early adulthood is when individuals are at the most risk for the development of mental health disorders (Liu, Stevens, Wong, Yasui, & Chen, 2018). Compared to the general population, college students experience higher levels of depression, anxiety, disordered eating, and substance abuse (Browning et al., 2021). Over the past eight years, the need for psychological services on college campuses in the United States has continued to grow, with about 63% of students reporting high levels of psychological distress (Son, Hegde, Smith, Wang, Sasangohar, 2020). With the growing rates of mental illness, and the students' academic success at risk, it is no surprise that mental health is one of the most growing concerns on college campuses in the United States (Liu et al., 2018).

In addition, the growing potential for the development of mental health challenges during this sensitive time is only accelerated by social media usage. Nowadays, it is almost impossible for college students to go about their lives without spending time on some form of social media. Studies have indicated that increased social media usage is positively correlated with depression and other mental health concerns (Ivie, Pettitt, Moses, & Allen, 2020). According to a study conducted by Tibber, Zhao, and Butler (2020), elevated social media usage was found to have a negative impact on the self-esteem and overall mental health of individuals. The study consisted of 18 to 30-year-old

individuals who answered questionnaires about their social media behavior and mental health. The data showed that high levels of social media use was a strong predictor of low self-esteem in the population. In addition, individuals who were low in self-esteem and who had high levels of social media usage were more likely to be adolescents or young adults (Tibber, Zhao, & Butler, 2020).

In addition to these concerns, the COVID-19 pandemic has catalyzed the current-day mental health crisis. The pandemic introduced additional stressors into our daily lives that have taken a psychological toll on the population. Since the outbreak, general anxiety levels of adults in the United States jumped from 9 percent to 18 percent (Pew Research Center, 2020). Unfortunately, college campuses have not been immune to the pandemic's effects on mental health. Studies have shown that the COVID-19 pandemic has led to an increase in a variety of mental health concerns, most notably in depression, disordered eating, and alcohol use disorder (Kim, Rackoff, Fitzsimmons-Craft, Shin, Zainal, Schwob, Eisenberg, Wilfley, Taylor, & Newman 2022; Son et al., 2020).

A study conducted at the University of Vermont by Copeland and colleagues (2021) showed how the COVID-19 pandemic affected university students. Initially designed to evaluate the general emotional health and wellness of students at the University of Vermont, the study was adapted during the Spring semester of 2020 once the COVID-19 pandemic hit and students were sent home. Using an app on their phones, students completed a comprehensive wellness and mood evaluation at the start and end of the study. Using the same app on their phone, they were also asked to complete general wellness and mood assessments daily. The study concluded that the onset of the COVID-19 pandemic resulted in a significant decrease in participants' mood and Wellness Index,

or wellness behaviors (hydration, sleep, exercise, and nutritional quality). The study also found that there was also a significant increase in screen time (Copeland et al., 2021).

Social media has played an essential role throughout this pandemic, providing necessary resources and information to the public and allowing us to stay connected virtually. However, the negative effects of social media could potentially be exaggerated by the COVID-19 pandemic due to the pre-existing, high levels of stress within college students (Bendau, Petzold, Pyrkosch, Maricic, Betzler, Rogoll, Grobe, Strohle, & Plag, 2020). In a study conducted by Bendau and colleagues (2020), the association between media consumption during the COVID-19 pandemic and psychological distress was evaluated using a sample from the general population of Germany. An online survey was used to determine symptoms of depression, unspecific anxiety, and COVID-19 related anxiety as well as specify the individual's media consumption behavior (type, frequency, and duration). Findings indicated that social media usage, more so than any other form of media, was strongly positively correlated with mental distress. Specifically, social media usage exceeding two and half hours per day was associated with elevated levels of anxiety, depression, and COVID-related fear (Bendau et al., 2020).

While plenty of research has been conducted on the relationship between social media and mental health, and the COVID-19 pandemic and mental health, few studies have looked at the mediating relationship of COVID-19 on the existent relationship between social media and mental health. In addition, few studies have utilized longitudinal designs and looked specifically at these trends in college students. The current study seeks to add to the existing literature on this relationship and contribute to a better understanding of social media's effect on mental health throughout the pandemic.

The current study is a longitudinal and correlational study that seeks to highlight the relationship between social media usage and mental health among college students. Specifically, this study evaluated students' self-reported changes in their mental health and social media usage as a result of the COVID-19 pandemic. It was predicted that participants with higher levels of social media usage will report higher levels of mental health issues. In addition, it was predicted that participants will self-report having lower social media usage and better mental health prior to the pandemic. Last, it was also predicted that changes in social media usage during the pandemic will predict participants' self-reported levels of mental health at the end of the semester.

## **Materials and Methods**

Participants for the current study consisted of undergraduate University of Dayton students who were enrolled in Psychology 101. Participants were able to register for the study using Sona Systems through the University of Dayton Psychology Department and were awarded 1.5 class research credits (1 credit for completing the first half and .5 credits for completing the second half) for their participation. Students were prompted to create a unique identification number that allowed their responses from the beginning and the end of the semester to be matched anonymously.

A total of 62 participants completed the study, 56 who identified as female and 6 who identified as male. All students indicated that their gender identity matched their sex assigned at birth. Due to the small number of male participants and statistical differences between genders, male participants were excluded from further analyses. Participants completed a closed-ended demographics and social media use survey designed by the



researcher. Of the remaining female participants, responses indicated that the average age for this sample was 18, and that students were primarily in their first (41.07%) and second (39.28%) year of college, with smaller numbers reporting being in their third (14.28%) or fourth year of college (5.35%). Social media use was measured using a closed-ended survey that evaluated the duration (hours at a time), frequency (hours per day/week), and type (Instagram, Snapchat, Twitter, Facebook, TikTok, Other) of participants' usage.

A modified version of the Facebook Intensity (FBI) scale was used to measure participants' emotional connectedness to and their integration of social media in their daily lives. The FBI scale was developed by Ellison, Steinfield, and Lampe (2007) to measure the degree to which individuals are actively engaged in Facebook and their emotional connection to the site. The FBI scale is made up of eight Likert-scale questions in which participants respond on a scale of 1 (strongly disagree) to 5 (strongly agree) (Ellison et al., 2007). The FBI scale is widely used and has proven a reliable measurement in a multitude of studies and settings (Sigerson & Cheng, 2018). In addition, the FBI scale has shown it remains reliable even when used to measure different social media platforms and overall social media engagement (Salehan & Negahban, 2013; Piwek & Joinson, 2016). In order to adjust the instrument for the current study's purposes, the word "Facebook" was replaced with the words "social media." This survey is available in the public domain.

To measure mental health, the study assessed participants' levels of anxiety and depression using the Patient Health Questionnaire Anxiety and Depression Scale (PHQ-ADS). The PHQ-ADS is a self-administered, 16-item survey in which participants report

on the degree to which they relate with items on a scale of 0 (not at all) to 3 (nearly every day; Kroenke et al., 2016). Kroenke et al. (2016) created the PHQ-ADS by combining the Patient Health Questionnaire (PHQ-9) and the Generalized Anxiety Disorder Scale (GAD-7; Teymoori, 2020). The PHQ-9 is a 9-item measure whose questions correspond to the nine diagnostic criteria outlined by the Diagnostic Statistical Manual (DSM) IV for depressive disorders (Doi, Ito, Takebayashi, Muramatsu, & Horikoshi, 2018). The contents of the scale can be seen in Figure 1. Higher scores on the PHQ-9 indicate more severe depression and lower scores indicate lower levels of depression. Studies have shown that the PHQ-9 has high reliability and validity in its assessment abilities across different settings, cultures, and types of depressive disorders (Doi et al., 2018; Urtasun et al., 2019; Barroso, Melo, Silva, & Guimaraes, 2019).

The GAD-7 is a 7-item Likert-scale whose questions correspond to the seven diagnostic criteria outlined by the DSM IV for anxiety disorders. The contents of the scale can be seen in Figure 1. Higher scores on the GAD-7 indicate more severe anxiety and lower scores indicate lower levels of anxiety. While originally designed as a screening tool for generalized anxiety disorder, studies have affirmed the validity of using the GAD-7 to screen for a broad general measure of anxiety (Dear et al., 2011; Jordan, Shedden-Mora, & Lowe, 2017). The dual administration of the PHQ-9 and the GAD-7, referred to as the PHQ-ASD, is a widely used instrument that studies have shown to be a reliable and valid instrument to measure depression and anxiety (Teymoori et al., 2020; Cernea, Both, Hut, Sular, & Roiban, 2019). These surveys are available in the public domain. A copy of all instruments used in this study can be found in Appendix A.

**Figure 1**

*GAD-7 and PHQ-9 Scale*

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)					GAD-7				
Over the <u>last 2 weeks</u> , how often have you been bothered by any of the following problems? <i>(Use "✓" to indicate your answer)</i>					Over the <u>last 2 weeks</u> , how often have you been bothered by the following problems? <i>(Use "✓" to indicate your answer)</i>				
	Not at all	Several days	More than half the days	Nearly every day	Not at all	Several days	More than half the days	Nearly every day	
1. Little interest or pleasure in doing things	0	1	2	3	1. Feeling nervous, anxious or on edge	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3	2. Not being able to stop or control worrying	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3	3. Worrying too much about different things	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3	4. Trouble relaxing	0	1	2	3
5. Poor appetite or overeating	0	1	2	3	5. Being so restless that it is hard to sit still	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3	6. Becoming easily annoyed or irritable	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3	7. Feeling afraid as if something awful might happen	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3	<i>(For office coding: Total Score T__ = __ + __ + __)</i>				
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3					
FOR OFFICE CODING: <u>  0  </u> + <u>  </u> + <u>  </u> + <u>  </u> =Total Score: <u>  </u>									

*Note.* The figure above shows the items included in the GAD-7 and PHQ-9 as they were presented to participants.

The current study took place over four months, with two data collection periods: one during August of 2021 and one during November 2021. Participants completed the study remotely using online questionnaires. Before beginning, participants were shown an informed consent document that explained all the necessary aspects of the research. Once the participants signed the form, thereby agreeing to participate, the study began. During the first data collection period, participants were given the set of questionnaires twice and were prompted to respond to each in terms of their behavior before the pandemic or their behavior at that time. During the second period of data collection, participants were only asked to fill out the questionnaires in response to their current behaviors. In order to avoid priming effects that may be caused by the chronological occurrence of these surveys, counterbalancing was used. During the first data collection

period, participants were randomly assigned to either receive the retrospective behavior survey first or the current behavior survey first. In addition, participants also received the GAD-7, PHQ-9, and the FBI scale in random order during both data collection periods.

After the second round of data collection, participants were given a debriefing document that explained the study in its entirety. They were also provided with references and contact information in case they had any further questions or concerns about the study. Data obtained from the study was coded by the researcher and entered into SPSS for further analyses. Copies of the debriefing and informed consent documents can be seen in Appendix B.

## **Results & Analyses**

### *Social Media Usage*

Due to a wide variance in responses, frequency and duration data collected from the social media usage measure were not analyzed. Prior to the pandemic (Time 1), the highest number of participants indicated that they used Instagram (94.6%) and Snapchat (92.8%). Fewer reported using TikTok (46.4%), Twitter (37.5%), and Facebook (37.5%) and even fewer reported utilizing Reddit (3.57%) or some other social media platform (7.1%). When responding regarding their most used social media platform, the majority of participants said Snapchat (51.78%), with fewer participants saying Instagram (23.21%), TikTok (14.2%), Twitter (7.14%), Facebook (1.78%), or some other social media platform (1.78%).

At the start of the semester, the highest number of participants indicated that they used Snapchat (96.4%), Instagram (92.8%), and TikTok (83.9%). Fewer reported using Facebook (50%) and Twitter (41%), and even fewer reported utilizing Reddit (3.5%) or

some other social media platform (14.2%). When responding to what their most used social media platform was, the majority of participants said TikTok (48.2%) with fewer participants saying Snapchat (28.5%), Instagram (16%), Twitter (3.5%), Facebook (1.7%), or some other social media platform (1.7%). Compared to before the pandemic, participants reported using TikTok at a much higher rate at the start of the semester. Before the pandemic, TikTok was the preferred platform of only 14.2% of participants. However, at the start of the semester, it became the most preferred platform, with 48.2% participants reporting it as their most used form of social media.

At the end of the semester, the most common social media platforms used by participants were Snapchat (98.21%), Instagram (96.42%), and TikTok (82.14%). Fewer reported using Facebook (39.28%) and Twitter (33.92%), and even fewer reported utilizing Reddit (5.35%) or some other social media platform (3.57%). When responding to what their most used social media platform was, the majority of participants said TikTok (42.85%) with fewer participants saying Snapchat (28.5%), Instagram (21.42%), Facebook (3.57%), Twitter (1.7%), or some other social media platform (1.7%). While the distribution of most used platforms is consistent from the start of the semester to the end, there is some variation in the platforms used. While Snapchat, Instagram, and TikTok usage rates are fairly stable, Facebook and Twitter usage decreased.

#### *Differences Between Male and Female Participants*

An independent-samples t-test was used to determine if there was a significant difference between the male and female participants in the sample. There was no significant difference between the male ( $M = 5.83$ ,  $SD = 3.86$ ) and female ( $M = 7.14$ ,  $SD = 5.11$ ) participants for their GAD scores during Time 1. There was also no significant

difference in male ( $M = 7.33$ ,  $SD = 7.31$ ) and female ( $M = 6.25$ ,  $SD = 5.90$ ) PHQ scores during this time period. However, there was a significant difference between the FBI scores for the male ( $M = 19.83$ ,  $SD = 7.80$ ) and female ( $M = 26.80$ ,  $SD = 7.08$ ) participants during Time 1,  $t(60) = 2.26$ ,  $p = 0.01$ .

T-test analyses comparing the male ( $M = 7.5$ ,  $SD = 5.92$ ) and female ( $M = 9.79$ ,  $SD = 5.79$ ) GAD scores from Time 2 showed that there was no significant difference. There was also found to be no significant difference between the male ( $M = 6.83$ ,  $SD = 6.11$ ) and female ( $M = 8.3$ ,  $SD = 5.27$ ) scores for the PHQ during Time 2. However, there was a significant difference,  $t(60) = 1.79$ ,  $p = .039$ , between the FBI scores for the male ( $M = 22.83$ ,  $SD = 5.3$ ) and female ( $M = 28.13$ ,  $SD = 6.99$ ) participants during Time 2.

During Time 3, there was a significant difference,  $t(60) = 2.91$ ,  $p = .002$ , between the male ( $M = 2.5$ ,  $SD = 3.14$ ) and female ( $M = 9.21$ ,  $SD = 5.51$ ) GAD scores. There was also a significant difference,  $t(60) = 2.12$ ,  $p = .01$ , between the male ( $M = 3.83$ ,  $SD = 3.86$ ) and female ( $M = 9.02$ ,  $SD = 5.8$ ) PHQ scores during Time 3. However, when comparing the male ( $M = 25.17$ ,  $SD = 5.03$ ) and female ( $M = 28.89$ ,  $SD = 5.47$ ) FBI scores, there was no significant difference. Due to the significant difference between male and female scores during various time periods, and the large discrepancy in the number of participants in these two groups, male participants were excluded from further analyses.

### *Change Scores*

The differences between participants' GAD, PHQ, and FBI scores from Time 1, Time 2, and Time 3 were calculated using change scores. To produce change scores for

Time 1 and Time 2, participants' Time 2 GAD-7, PHQ9, and FBI scores were subtracted from their Time 1 scores. Similarly, to produce change scores for Time 2 and Time 3, participants' Time 3 GAD-7, PHQ9, and FBI scores were subtracted from their Time 2 scores.

### *Table of Means*

Using SPSS, a table of means was developed to show the average scores for the GAD, PHQ, and FBI for all time periods. This table of means can be seen in Table 1. The means for the GAD-7 and PHQ-7 scores across all time periods indicate mild levels of anxiety and depression according to the classification determined by Doi and colleagues (2018).

**Table 1**

### *Table of Means*

<b>One-Sample Statistics</b>				
	N	Mean	Std. Deviation	Std. Error Mean
FBI1	56	26.80	7.088	.947
GAD1	56	7.14	5.111	.683
PHQ1	56	6.25	5.909	.790
FBI2	56	28.13	6.999	.935
GAD2	56	9.79	5.796	.774
PHQ2	56	8.30	5.274	.705
FBI3	56	28.89	5.470	.731
GAD3	56	9.21	5.516	.737
PHQ3	56	9.02	5.804	.776

*Note.* The table above shows the mean scores for the FBI, GAD-7, PHQ-9 across all three measurement periods.

### *Correlations*

Using SPSS, a correlations table was developed showing the correlational relationships between all the different variables. This correlations table can be seen in Table 2. Pre-pandemic reported FBI scores were highly correlated with FBI scores at the

beginning of the semester ( $r(54) = .78, p < .001$ ) and at the end of the semester ( $r(54) = .73, p < .001$ ). FBI scores at the beginning and end of the semester were also highly correlated with each other ( $r(54) = .76, p < .001$ ). Similarly, pre-pandemic GAD scores were correlated with scores on this instrument at the beginning ( $r(54) = .44, p < .001$ ) and end ( $r(54) = .43, p < .001$ ) of the semester. GAD scores at the beginning and end of the semester were also highly correlated with each other ( $r(54) = .66, p < .001$ ). The same trend was noted with pre-pandemic reported PHQ scores, which were correlated with levels of depression symptoms at the beginning ( $r(54) = .32, p = .015$ ) end ( $r(54) = .41, p = .002$ ) of the semester. Scores on this instrument at the beginning and end of the semester were also highly correlated ( $r(54) = .71, p < .001$ ).

Pre-pandemic anxiety scores were strongly correlated with depression scores as rated by participants at all three measurement points: before the pandemic ( $r(54) = .71, p < .001$ ), at the beginning of the semester ( $r(54) = .42, p = .001$ ) and at the end of the semester ( $r(54) = .37, p = .004$ ). The same trend was noted for pre-pandemic depression scores, which were correlated with anxiety scores before the pandemic as mentioned above, as well as at the beginning ( $r(54) = .33, p = .012$ ) and end of the semester ( $r(54) = .31, p = .018$ ). GAD and PHQ scores were also significantly correlated with each other across all other measurement points.

Pre-pandemic depression scores were correlated with FBI scores at the end of the semester ( $r(54) = -.32, p = .015$ ). FBI scores across all three measurement points were not correlated with any other GAD or PHQ scores.



**Table 2***Correlations Table*

		Correlations								
		FBI1	GAD1	PHQ1	FBI2	GAD2	PHQ2	FBI3	GAD3	PHQ3
FBI1	Pearson Correlation	--								
	N	56								
GAD1	Pearson Correlation	-.135	--							
	Sig. (2-tailed)	.322								
	N	56	56							
PHQ1	Pearson Correlation	-.126	.712**	--						
	Sig. (2-tailed)	.353	<.001							
	N	56	56	56						
FBI2	Pearson Correlation	.788**	-.115	-.152	--					
	Sig. (2-tailed)	<.001	.399	.262						
	N	56	56	56	56					
GAD2	Pearson Correlation	.030	.441**	.333*	-.112	--				
	Sig. (2-tailed)	.824	<.001	.012	.410					
	N	56	56	56	56	56				
PHQ2	Pearson Correlation	.054	.421**	.323*	.014	.805**	--			
	Sig. (2-tailed)	.694	.001	.015	.917	<.001				
	N	56	56	56	56	56	56			
FBI3	Pearson Correlation	.734**	-.213	-.324*	.766**	-.006	.065	--		
	Sig. (2-tailed)	<.001	.115	.015	<.001	.962	.635			
	N	56	56	56	56	56	56	56		
GAD3	Pearson Correlation	.049	.432**	.314*	.069	.668**	.762**	.209	--	
	Sig. (2-tailed)	.722	<.001	.018	.611	<.001	<.001	.123		
	N	56	56	56	56	56	56	56	56	
PHQ3	Pearson Correlation	-.022	.376**	.414**	-.042	.540**	.713**	.076	.801**	--
	Sig. (2-tailed)	.870	.004	.002	.760	<.001	<.001	.579	<.001	
	N	56	56	56	56	56	56	56	56	56

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

*Note.* The table above shows the correlations between and within measures across all measurement time periods.

*Means Comparisons*

Using a one-sample t-test, the mean GAD, PHQ, and FBI scores of participants from Time 1 were compared to their scores from Time 2. Scores on all measures were significantly higher at the beginning of the semester in comparison to reports of pre-pandemic functioning (GAD-7,  $t(55) = 12.63$ ,  $p < .001$ ; PHQ-9,  $t(55) = 11.782$ ,  $p < .001$ ; and FBI,  $t(55) = 28.3$ ,  $p < .001$ ). In comparing scores from the beginning to the end of the semester using a one-sample t-test, PHQ and FBI scores were significantly higher at the end of the semester (PHQ-9,  $t(55) = 11.78$ ,  $p < .001$ ; FBI,  $t(55) = 30.07$ ,  $p < .001$ ), but anxiety scores as measured by the GAD-7 were significantly lower at the end of the semester ( $t(55) = 12.63$ ,  $p < .001$ ).

### *Regression Analyses*

Linear multiple regressions were conducted to see if the PHQ-9 and the GAD-7 scores of participants at the end of the semester could be predicted. Participants' PHQ scores from Time 1 and Time 2 as well as the FBI change score from Time 1 to Time 2 (FBI2FBI1) was used to predict PHQ scores from Time 3. The overall model was significant,  $R^2 = .54$ ,  $F(3, 52) = 20.82$ ,  $p < .001$ . Further results showed that previous PHQ scores at Time 1 and Time 2 accounted for the significance of this model, but that the change in social media usage over the course of the pandemic did not contribute to this result.

Linear multiple regressions were conducted in this same way for participants' GAD scores. Participants' GAD scores from Time 1 (GAD1) and Time 2 (GAD2) as well as the FBI change score from Time 1 to Time 2 (FBI2FBI1) were used to predict their GAD scores at Time 3 (GAD3). The overall model was significant,  $R^2 = .49$ ,  $F(3, 52) = 17.02$ ,  $p < .001$ . Further results showed that anxiety scores at Time 1 and Time 2 were significant contributors to this model, but that participants' change in social media usage was not a significant factor.

## **Discussion**

The current study sought to evaluate how social media usage affected college students' mental health during the COVID-19 pandemic. Levels of anxiety were measured by the GAD-7, levels of depression were measured by the PHQ-9, and emotional connectedness to social media was measured by the FBI scale. Averages for each score across the three time periods were consistent with findings from previous studies (Siegerson and Cheng, 2018; Ellison, Steinfield, and Lampe, 2007; Cernea, Both,

Hutanu, Sular, and Roiban, 2019). While the average GAD-7 scores across all time periods are categorized as ‘mild anxiety’ and the average PHQ-9 scores across all time periods are categorized as ‘mild depression,’ there were significant changes in these scores that are worth noting.

Analyses showed that participants reported that their anxiety, depression, and emotional connectedness to social media were all lower prior to the pandemic than they were at the start of the semester. This finding supports the initial hypothesis put forward in the current study that mental health would be better and social media usage would be lower before the pandemic compared to after it. However, data also shows that while participants’ emotional connectedness to social media and their levels of depression increased from the start of the semester to the end, their levels of anxiety decreased. The reason for this decrease in anxiety is unclear. Researchers hypothesize, however, that such a decrease in anxiety could be related to the slight decrease in COVID-19 cases and regulations occurring during this time (Centers for Disease Control and Prevention, 2022).

Linear multiple regressions were conducted to determine if changes in social media habits during the pandemic could predict self-reported levels of mental health at the end of the semester, as hypothesized. While the overall models were significant, there was no significant relationship between changes in social media usage and mental health of college students. This did not support the initial hypothesis put forth by the current study. Since there are only a handful of studies that have looked at the mitigating relationship of social media on the COVID-19 pandemic’s effect on mental health, it cannot be said whether our findings support or oppose the larger body of research. The

few studies that have evaluated this relationship have also had mixed findings, some finding a relationship, others finding a small relationship, and others finding no relationship at all (Bendau et al., 2020; Fraser, Stockdale, Bryce, & Alexander, 2021).

### *Limitations*

Several limitations were present in the current study. First, the sample consisted of 56 female-identifying individuals from the University of Dayton. Since the participants from this study were a relatively small sample chosen from one school in the United States, results from this study alone cannot be generalized to the larger population. In addition, since there were significant differences between the male and female participants in our sample and there were not enough male participants to represent their population accurately, they were excluded from analyses. Larger studies with more heterogeneity and representation would be needed to corroborate a relationship between social media, the pandemic, and mental health.

A second limitation was that the study was online, it was not proctored, and it was self-administered. The researchers chose the online format to ensure data collection could continue despite COVID-19 conditions. However, administering the study in this way meant that participants could complete it in any environment, during any timeline, and without the quality assurance of a researcher being present. In fact, a review of time elapsed during study participation suggested that some participants may have completed the measures extremely quickly. Due to the study being administered in this way, researchers were not able to control for extraneous variables that may have impacted the data.

A third limitation of the study is that it used retrospective data to estimate students' self-reported mental health and social media levels prior to the pandemic. When asking someone to answer surveys in response to how they were behaving or feeling at another point in time, it is reasonable to assume that their estimates will not be absolutely accurate. Therefore, the use of retrospective data in this study is a limitation.

The final limitation of the study is multicollinearity. As shown in Table 2, all of our measures were highly inter-correlated as well as intra-correlated. When variables are as strongly correlated with one another as the ones in the current study are, it may inflate their combined predictive power and make it difficult to identify the individual predictability of any one variable. Therefore, the uncovering of any relationship between our variables may have been overpowered by their strong correlation.

### *Conclusions*

While the current study did not find a relationship between social media usage and mental health, other studies have found such a correlation (Ivie et al., 2020; Wright, Schaeffer, Mullins, Evans, & Young, 2020; Tibber et al., 2020). Future research should continue to investigate this relationship in order to gain a clearer understanding of their interaction. In addition, our study found that there were significant differences between the male and female scores in our sample. Future research investigating this topic should prioritize including males in their sample so that a better understanding of this relationship may be realized. Regardless of social media's role, data from the current study shows that the self-reported depression and anxiety of college students has risen significantly since the start of the COVID-19 pandemic, and despite small decreases has

not returned to pre-pandemic estimates. There is a mental health crisis happening on college campuses, and the findings from this study corroborate the argument of previous research that the COVID-19 pandemic has only exacerbated these issues (Copeland et al., 2021; Kim et al., 2022). Universities need to prioritize the mental wellbeing of their students and provide adequate resources for those who are struggling. While the world may be ready to move past the pandemic, decreasing restrictions and removing mandates, our minds are not. Creating resources and support for those most vulnerable to the trauma of this pandemic should be the top priority of our universities.

## References

- Barroso, S.M., Melo, A.P., Silva, M.A., & Guimaraes, M.D. (2019). Evaluation of the Brazilian version of Patient Health Questionnaire (PHQ-9) in Quilombola population using the Item Response Theory. *Salud Mental, 42*(1), 43-52.  
doi:10.17711/SM.0185-3325.2019.006
- Bendau, A., Petzold, M.B., Pyrkosch, L., Maricic, L.M., Betzler, F., Rogoll, J., Grobe, J., Strohle, A., & Plag, J. (2020). Associations between COVID-19 related media consumption and symptoms of anxiety, depression, and COVID-19 related fear in the general population in Germany. *European Archives of Psychiatry and Clinical Neuroscience, 1-9*. <http://dx.doi.org/10.1007/s00406-020-01171-6>
- Browning, M.H., Larson, R.L., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T.M., Thomsen, J., Reigner, N., Metcalf, E.C., D'Antonio, A., Helbich, M., Bratman, G.N., & Alvarez, H.O. (2021). Psychological impacts from COVID-19 among university students: risk factors across seven states in the United States. *PLoS One, 16*(1), 1-27.  
<https://doi.org/10.1371/journal.pone.0245327>
- Centers for Disease Control and Prevention. (2022, April 8). COVID data tracker weekly review. Centers for Disease Control and Prevention.  
<https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html>
- Cernea, S., Both, E., Hutanu, A., Sular, F.L., & Roiban, A.L. (2019). Correlations of serum leptin resistance with depression and anxiety in patients with type 2 diabetes. *Psychiatry and Clinical Neuroscience, 73*, 745-753.  
doi:10.1111/pcn.12922

- Copeland, W.E., McGinnis, E., Bai, Y., Adams, Z., Nardone, H., Devadanam, V., Rettew, J., & Hudziak, J.J. (2021). Impact of COVID-19 pandemic on college student mental health and wellness. *Journal of the American Academy of Child & Adolescent Psychiatry*, 60(1), 134-141, doi: 10.1016/j.jaac.2020.08.466
- Dear, B.F., Titov, N., Sunderland, M., McMillan, D., Anderson, T., Lorian, C., & Robinson, E. (2011). Psychometric comparison of the Generalized Anxiety Disorder Scale-7 and the Penn State Worry Questionnaire for measuring response during treatment of Generalized Anxiety Disorder. *Cognitive Behaviour Therapy*, 40(3), 216-227. doi:10.1080/16506073.2011.582138
- Doi, S., Ito, M., Takebayashi, Y., Muramatsu, K., & Horikoshi, M. (2017). Factorial validity and invariance of the Patient Health Questionnaire (PHQ-9) among clinical and non-clinical populations. *PLoS One*, 13(7).  
<https://doi.org/10.1371/journal.pone.0199235>
- Ellison, N.B., Steinfield, & C., Lampe, C. (2007). The benefits of Facebook “friends:” Social capital and college students’ use of online social network sites. *Journal of Computer-Mediated Communication*, 12(4), 1143-1168.  
<https://doi.org/10.1111/j.1083-6101.2007.00367.x>
- Fraser, A.M., Stockdale, L.A., Bryce, C.I., & Alexander, B.L. (2021). College students’ media habits, concern for themselves and others, and mental health in the era of COVID-19. *Psychology of Popular Media*, 11(2), 139-151.  
<https://doi.org/10.1037/ppm0000345>



- Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., Wang, Y., Fu, H., & Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *PLoS One*, *15*(4). <https://doi.org/10.1371/journal.pone.0231924>
- Huckins, J.F., DaSilva, A.W., Wang, W., Hedlund, E., Rogers, C., Nepal, S.K., Wu, J., Obuchi, M., Murphy, E.I., Meyer, M.L., Wagner, D.D., Holtzheimer, P.E., & Campbell, A.T. (2020). Mental health and behavior of college students during the early phases of the COVID-19 pandemic: Longitudinal smartphone and ecological momentary assessment study. *Journal of Medical Internet Research*, *22*(6). doi: 10.2196/20185
- Ivie, E.J., Pettitt, A., Moses, L.J., Allen, N.B. (2021). 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>
- Jordan, P., Shedden-Mora, M.C., & Lowe, B. (2017). Psychometric analysis of the Generalized Anxiety Disorder scale (GAD-7) in primary care using modern item response theory. *PLoS One*, *12*(8). <https://doi.org/10.1371/journal.pone.0182162>
- Kim, H., Rackoff, G.N., Fitzsimmons-Craft, E.E., Shin, K.E., Zainal, N.H., Schwob, J.T., Eisenberg, D., Wilfley, D.E., Taylor, C.B., & Newman, M.G. (2022). College mental health before and during the COVID-19 pandemic: Results from a nationwide survey. *Cognitive Therapy Research*, *46*, 1-10. <https://doi.org/10.1007/s10608-021-10241-5>
- Kroenke, K., Wu, J., Yu, Z., Balr, M.J., Kean, J., Stump, T., & Monahan, P.O. (2016). The Patient Health Questionnaire Anxiety and Depression Scale (PHQ-ADS):

Initial validation in three clinical trials. *Psychosom Med.*, 78(6), 716-727.

doi:10.1097/PSY.0000000000000322

Liu, C.H., Stevens, C., Wong, S.H., Yasui, M., & Chen, J.A. (2018). The prevalence and predictors of mental health diagnoses and suicide among U.S. college students: Implications for addressing disparities in service use. *Wiley*, 36, 8-17.

doi:10.1002/da.22830

Piwek, L., & Joinson, A. (2016). "What do they snapchat about?": Patterns of use in time-limited instant messaging service. *Computers in Human Behavior*, 54, 358-367. <http://dx.doi.org/10.1016/j.chb.2015.08.026>

Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior*, 29, 2632-2639.

<http://dx.doi.org/10.1016/j.chb.2013.07.003>

Sigerson, L., & Cheng, C. (2018). Scales for measuring user engagement with social network sites: A systematic review of psychometric properties. *Computers in Human Behavior*, 83, 87-105. <https://doi.org/10.1016/j.chb.2018.01.023>

Son, C., Hedge, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study.

*Journal of Medical Internet Research*, 22(9), doi:10.2196/21279

Teymoori, A., Gorbunova, A., Haghish, F.E., Real, R., Zeldovich, M., Wu, Y.J.,

Polinder, S., Asendorf, T., Menon, D., & Steinbuechel, N.V. (2020). Factorial structure and validity of depression (PHQ-9) and anxiety (GAD-7) scales after traumatic brain injury. *Journal of Clinical Medicine*, 9, 837-858.

doi:10.3390/jcm9030873

- Tibber, M.S., Zhao, J., & Butler, S. (2020). The association between self-esteem and dimensions and classes of cross-platform social media use in a sample of emerging adults—Evidence from regression and latent class analysis. *Computers in Human Behavior, 109*, 1-12. doi:10.1016/j.chb.2020.106371
- Urtasun, M., Daray, F.M., Teti, G.L., Coppolillio, F., Herlax, G., Saba, G., Rubinstein, A., Araya, R., & Irazola, V. (2019). Validation and calibration of the patient health questionnaire (PHQ-9) in Argentina. *BMC Psychiatry, 19*(1), 291-302. <https://doi.org/10.1186/s12888-019-2262-9>
- Wright, R.R., Schaeffer, C., Mullins, R., and Evans, A. (2020). Comparison of student health and well-being profiles and social media use. *Journal of Psychological Research, 25*(1), 14-21. <https://doi.org/10.24839/2325-7342.JN25.1.14>

## **Appendix A**

### **Instruments**

#### **Demographics Measure (Closed-Ended Questions)**

1. What is your current age? (17,18, 19, 20, 21, 22, 23, 24, or other)
2. What is your current academic year? (first, second, third, fourth, fifth, or other)
3. What sex were you assigned at birth? (female, male, or other)
4. What is your gender identity? (female, male, non-binary, or other)

#### **Social Media Usage Measure: Current Behaviors**

1. Over the last two weeks, about how many hours (at one time) do you think you spent on social media? Please respond with a number.
2. Over the last two weeks, about how many hours total do you think you have spent on social media per day? Please respond with a number.
3. Which social media platforms do you currently use (select all that apply)?  
(Instagram, Snapchat, Twitter, Facebook, Reddit, TikTok, other)
4. Which social media platform do you currently use the most? (Instagram, Snapchat, Twitter, Facebook, Reddit, TikTok, other)

#### **Social Media Measure Questions: Behaviors Before the COVID-19 Pandemic**

1. Prior to the COVID-19 pandemic, about how many hours (at one time) do you think you spent on social media? Please respond with a number.
2. Prior to the COVID-19 pandemic, about how many hours total do you think you spent on social media per day? Please respond with a number.
3. Prior to the COVID-19, what social media platforms did you use (select all that apply)? (Instagram, Snapchat, Twitter, Facebook, Reddit, TikTok, other)

4. Prior to COVID-19, which social media platform did you use the most?  
(Instagram, Snapchat, Twitter, Facebook, Reddit, TikTok, other)

**PHQ-ADS**

**GAD-7**

Over the <u>last 2 weeks</u> , how often have you been bothered by the following problems? <i>(Use "✓" to indicate your answer)</i>	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

**PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)**

Over the <u>last 2 weeks</u> , how often have you been bothered by any of the following problems? <i>(Use "✓" to indicate your answer)</i>	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

## **FBI Scale**

Participants asked to respond to questions 1-6 on a range of 1 = strongly disagree to 5 = strongly agree.

1. Social media is part of my everyday activity
2. I am proud to tell people I'm on social media
3. Social media has become part of my daily routine
4. I feel out of touch when I haven't logged onto social media for a while
5. I feel I am part of the social media community
6. I would be sorry if social media shut down
7. Approximately how many TOTAL social media friends do you have? \*
8. In the past week, on average, approximately how much time PER DAY have you spent actively using social media? \*\*

\*This will be asked as a closed-ended question using a ten-point ordinal scale (100 or less, 101-300, 301-500, 501-700, 701-900, more than 900).

\*\*This will be asked as an open-ended question, allowing participants to fill in approximately how much time they spend on social media.

## Appendix B

### Informed Consent and Debriefing Documents

#### Informed Consent to Participate in a Research Project

Project Title:	Social Media During COVID-19
Investigator(s):	Claudia Dominique and Dr. Melissa Guadalupe, PhD (faculty sponsor)
Description of Study:	<p>The current study is aimed at evaluating the past and present social media habits and mental health of college students. This study will take place in two phases. You will be completing Phase 1 now, and once you have completed it, you will be sent a link to complete Phase 2 near the end of the semester. Before beginning the study today, you will be prompted to create a personal unique code with your initials and birthday. This code will be used to link your data from Phase 1 and Phase 2. Once the study has concluded and your data has been linked, your personal code will be deleted to ensure the confidentiality of your identity. Today during Phase 1, you will be asked to complete a demographics survey and 3 additional questionnaires that will ask you about your social media usage and behavior as well as your experiences with mental health. You will be asked to complete each of these 3 questionnaires twice, once in response to your behaviors now and once as an estimate of your behaviors before the COVID-19 pandemic. The study will prompt you as when you should be reporting your current behaviors and when you should be reporting your past behaviors. Once you complete the study, you will receive your credit and you will be reminded through Sona at a later date to return for Phase 2. During Phase 2, you will be asked to complete a demographics survey and 3 additional questionnaires that will ask you about your social media usage and behavior as well as your experiences with mental health. Once you complete the study, you will be debriefed and receive your credit. If for whatever reason you choose to not complete Phase 2 of the study, you will be emailed a copy of the debriefing form after data collection for the study has concluded. The total amount of credit you will be awarded for completing this study in its entirety is 1.5 credits. After your completion of Phase 1, you will be awarded 1 credit and after your completion of Phase 2, you will be awarded 0.5 credits.</p>

Adverse Effects and Risks:	Participants might experience negative feelings such as psychological discomfort and stress while answering some questions. The current study will ask you questions about your personal experiences with depression and anxiety symptoms as well as about your social media habits which may promote self-awareness of mental health and social media habits that you were not previously aware of. Counseling services are provided as a free service to undergraduate students. If you are experiencing psychological distress, you may contact the University of Dayton Counseling Center at (937) 229-3141. You may call after normal business hours and the on-call staff member will return your call. If you feel any discomfort or distress while participating in this study, you are free to terminate your participation at any time without penalty.
Duration of Study:	The study will take approximately 1 hour to complete today.
Confidentiality of Data:	Your name will be kept separate from the data. Both your name and the data will be kept in a locked filing cabinet and/or online in a secure file. Only the investigators named above will have access to the locked filing cabinet and/or secure file. Your name will not be revealed in any document resulting from this study.
Contact Person:	Participants may contact Claudia Dominique at <a href="mailto:dominiquecl@udayton.edu">dominiquecl@udayton.edu</a> or Dr. Melissa Guadalupe at <a href="mailto:mguadalupe1@udayton.edu">mguadalupe1@udayton.edu</a> . If you have questions about your rights as a research participant you may also contact the chair of the Research Review and Ethics Committee, at <a href="mailto:rrec@udayton.edu">rrec@udayton.edu</a> or (937) 229-2713 or in SJ 329.
Consent to Participate:	I have voluntarily decided to participate in this study. If I had questions about this study, I have contacted the investigator named above and he or she has adequately answered any and all questions I have about this study, the procedures involved, and my participation. I understand that I may voluntarily terminate my participation in this study at any time and still receive full credit. In addition, I certify that I am 18 (eighteen) years of age or older. By typing my name and date below, I consent to participate in this study. If I do not want to participate, I can close the browser.



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Student's  
(typed)  
(typed)

Name  
Date

The University of Dayton supports researchers' academic freedom to study topics of their choice. The topic and/or content of each study are those of the principal investigator(s) and do not necessarily represent the mission or positions of the University of Dayton.

## Debriefing Form

### **Information about the Social Media During COVID-19**

#### **Objective:**

Compared to the rest of the population, college students are significantly more vulnerable to mental health issues. In addition, research has shown that increased social media usage among college students is associated with a higher likelihood of developing mental health issues (Tibber, Zhao, & Butler, 2020). With the added stressor of COVID-19 in college students' lives, mental health concerns on college campuses are rising.

The objective of the current study is to examine the relationship between mental health and social media use among college students during the COVID-19 pandemic, and to determine whether the relationship between these variables changes over time. Specifically, the current study intends to evaluate whether the type, duration, and frequency of social media usage are associated with negative mental health symptoms in college students. In addition, the study is also collecting data on individuals' perceived impact of the pandemic on their social media behavior, and subsequently, their overall mental health.

#### **Hypothesis:**

It was predicted that participants with higher levels of social media usage would report the highest levels of mental health issues. In addition, it was predicted that participants would self-report having decreased social media usage and better mental health prior to the pandemic.

#### **Your Contribution:**

By participating in this research today, you have helped us better understand how social media usage and mental health are related. Your contribution to this study will enable us to answer our research questions.

#### **Benefits:**

This study was conducted so that we could better understand how social media behavior interacts with the mental health of college students so that necessary support can be given. Also, collecting data on this interaction during the COVID-19 pandemic could potentially provide a greater insight into the current mental wellbeing of college students. Through a better understanding of the mental health of college students, we can provide better resources that will better serve their mental health needs.

#### **Assurance of Privacy:**

We are studying the relationship between social media usage and mental health in college students and are not evaluating you personally in any way. Your responses will be kept completely confidential and your responses will only be identified by a participant number in the data set with other participant numbers. This participant number will allow us to match your responses from Phase 1 to your responses from Phase 2. Once this information is matched, the secured file with your name and participant

number will be destroyed. Your name will not be revealed in any document resulting from this study.

**Please note:**

- We ask you to kindly refrain from discussing this study with others in order to help us avoid biasing future participants.
- If you have any questions please do not hesitate to contact any of the individuals listed on this page.

**Contact Information:**

Students may contact Claudia Dominique at [dominiquec1@udayton.edu](mailto:dominiquec1@udayton.edu) or Dr. Melissa Guadalupe at [mguadalupe1@udayton.edu](mailto:mguadalupe1@udayton.edu) if you have questions or problems after the study. If you have questions about your rights as a research participant you may also contact the chair of the Research Review and Ethics Committee at [rrec@udayton.edu](mailto:rrec@udayton.edu), or (937) 229-2713, or in SJ 329.

Thank you for your participation. I will update your research credit on the online system.

**Disclaimer:**

The University of Dayton supports researchers' academic freedom to study topics of their choice. The topic and/or content of each study are those of the principal investigator(s) and do not necessarily represent the mission or positions of the University of Dayton.

**References:**

- Bendau, A., Petzold, M.B., Pyrkosch, L., Maricic, L.M., Betzler, F., Rogoll, J., Grobe, J., Strohle, A., & Plag, J. (2020). Associations between COVID-19 related media consumption and symptoms of anxiety, depression, and COVID-19 related fear in the general population in Germany. *European Archives of Psychiatry and Clinical Neuroscience*, 1-9. <http://dx.doi.org/10.1007/s00406-020-01171-6>
- Browning, M.H., Larson, R.L., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T.M., Thomsen, J., Reigner, N., Metcalf, E.C., D'Antonio, A., Helbich, M., Bratman, G.N., & Alvarez, H.O. (2021). Psychological impacts from COVID-19 among university students: risk factors across seven states in the United States. *PLoS One*, 16(1), 1-27. <https://doi.org/10.1371/journal.pone.0245327>
- Tibber, M.S., Zhao, J., & Butler, S. (2020). The association between self-esteem and dimensions and classes of cross-platform social media use in a sample of emerging adults—Evidence from regression and latent class analysis. *Computers in Human Behavior*, 109, 1-12. doi:10.1016/j.chb.2020.106371