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Social Media Behaviors and Experiences During the COVID-19 Pandemic: Associations With Anxiety, Depression, and Stress

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Abstract

The majority of research concerning public health crises and social media platforms has focused on analyzing the accuracy of information within social media posts. The current exploratory study explored social media users' specific social media behaviors and experiences during the early weeks of the COVID-19 pandemic and whether these behaviors and experiences related to anxiety, depression, and stress. Data were collected March 21–31, 2020 from adults in the United States (N = 564) through snowball sampling on social media sites and Prime Panels. Online surveys included questions regarding social media use during the pandemic and the Depression Anxiety and Stress Scales (DASS). Forward stepwise modeling procedures were used to build three models for anxiety, stress, and depression. Participants who actively engaged with COVID-19 social media content were more likely to experience higher anxiety. Those who had emotional experiences via social media and used social media to connect during the pandemic were susceptible to higher levels of stress and depression. The current study suggests that during the pandemic specific behaviors and experiences via social media were related to anxiety, stress, and depression. Thus, limiting time spent on social media during public health crises may protect the mental health of individuals.

Introduction

The novel coronavirus (COVID-19) pandemic was declared a national emergency in the United States on March 13, 2020 (The White House, 2020). To slow the spread of the virus, various nonpharmaceutical public interventions were implemented and, by March 23, 2020, 43 states had state-wide (or partial state) stay-at-home orders (Mervosh et al., 2020). This led to changes in household routines, including decreased access to supportive resources and increased social isolation (Brown et al., 2020). Emerging pandemic research indicated some adults experienced elevated symptoms of stress, anxiety, and depression during this time (Brown et al., 2020). Wiederhold (2020a) concluded that the COVID-19 pandemic was "impacting our collective mental health" and that social media can be both helpful and problematic in supporting human well-being during the pandemic (p. 275). Social media can facilitate interpersonal connection while people practice social distancing, but it can also be a place where anxiety and fear escalate with the dissemination of misinformation (Wiederhold, 2020a, 2020b).

Seventy-two percent of adults across demographic characteristics in the United States are active users of social media platforms (Pew Research Center, 2019). Adults report using YouTube (72%), Facebook (69%), Instagram (37%), Pinterest (28%), Snapchat (24%), and Twitter (22%; Perrin & Anderson, 2019; Pew Research Center, 2019) and also report spending an average of 45 minutes daily using these platforms (The Nielson Company, 2019). Prepandemic reports indicate that adults used social media platforms for staying in touch with family and friends and for informational purposes (Shearer, 2018; Smith, 2011).

The convenience of social media makes it a primary source for the public to seek information during large-scale disasters (Faustino et al., 2012). Much of the emerging research on social media use during public health crises (e.g., COVID-19, H1N1, H7N9, Zika Virus) has focused on the accuracy of information on social media platforms by analyzing specific posts (Chew & Eysenbach, 2010; Pandey et al., 2010; Sharma et al., 2017). Most social media research specific to COVID-19 has been conducted with the Chinese microblogging social media application titled Weibo (Li, S. et al., 2020; Li, L. et al., 2020). Weibo posts during the pandemic have been categorized into various topic areas (e.g., advice, explanation of measures that have been taken, donation focused, providing support/asking for help, being critical, or refuting rumors; Li, L. et al., 2020) and, compared to posts prior to the pandemic, posts including negative emotions during the pandemic increased (Li, L. et al., 2020). Presently, it is unclear if specific behaviors on social media platforms during COVID-19 are related to stress, anxiety, and depression. Thus, the current study was designed to explore behaviors and experiences on social media and levels of stress, anxiety, and depression during the early weeks of the pandemic in the United States.

Methods

Sample

The sample included adults (N = 564) from 46 states in the United States (not represented: Alaska, Rhode Island, Vermont, and West Virginia). Most of the participants identified as female (61.52%), White (80.82%), and married (70.39%). See Table 1 for sample characteristics. Participants reported using the following social media platforms: YouTube (85.59%), Facebook (94.13%), Instagram (70.94%), Snapchat (41.10%), Pinterest (54.19%), and Twitter (40.14%).

Procedures

Study procedures were approved by Montana State University's Institutional Review Board. Participants (n = 600) were recruited through snowball sampling on social media sites and through Prime Panels (see https://www.cloudresearch.com/), which is an established way of recruiting diverse community samples (Chandler et al., 2019). Data collection occurred March 21–31, 2020, and the current study is part of a larger

study focused on well-being during COVID-19 (see Vaterlaus et al., 2021). Participants completed online surveys created on Qualtrics (https://www.qualtrics.com). To be included in the current study participants needed to use at least one social media platform and 36 participants were not social media users.

Table 1. *Demographic Characteristics of Sample*

Variable	Total N= 564, *n*(%)
Age	
18-35	276 (48.94)
36-55	196 (34.75)
56+	92 (16.13)
Gender	
Male	216 (38.37)
Female	347 (61.63)
Race	
White	455 (80.82)
All other races	108 (19.18)
Sexual Orientation	
Heterosexual	539 (95.91)
Sexual minority	23 (4.09)
Education	
Less than HS degree or HS grad	51 (9.12)
Some college of vocational school	142 (25.40)
Bachelor's degree	199 (35.60)
Graduate degree or professional degree	167 (29.87)
Annual Income	
Less than $20,000	66 (11.70)
$20,000-$39,999	78 (13.83)
$40,000-$59,999	74 (13.12)
$60,000-$74,999	75 (13.30)
$75,000-$99,999	91 (16.13)
$100,000-$149,999	104 (18.44)
$150,000 or greater	76 (13.48)
Marital	
Single (divorced, widowed, single)	167 (29.61)
Married/cohabitating	397 (70.39)
Residence Location	
Urban	386 (69.30)
Suburban	138(24.78)
Rural	33 (5.92)
Employment	
Full-time	276 (49.02)
Part-time	104 (18.47)
Retired, stay-at-home parent, student, disabled	152 (27.00)
Unemployed	31 (5.51)

Measurement

We asked participants for demographic information, COVID-19 information, social media use, COVID-19 related social media behaviors, mental health symptoms, and experience with loneliness. All items that were developed for this study were piloted with 20 adults prior to distributing the final survey.

COVID-19 Information.
Based on previous research on public health crises, items were developed that asked if participants had an underlying risk factor for COVID-19, their level of concern about COVID-19 (5-point Likert scale; *not at all concerned* to *extremely concerned*), and their current practice of social distancing (the five options ranged from *I do not worry about staying in my residence and go a variety of places* to *I am on full lockdown and do not leave my residence*).

Social Media Use.
Participants indicated whether they used each social media platform (i.e., YouTube, Facebook, Instagram, Pinterest, Snapchat, and Twitter) or not, and if they used the platform, they were asked to report how much time they spent daily with each platform during the last week (e.g., 0 minutes, 1–10 minutes, 11–30 minutes, 31–59 minutes, 1 hour, 2 hours, 3 hours, etc.). The midpoint of the category was taken to represent the number of minutes spent when response options included a range; all other categories used the corresponding number in minutes. Categories were summed into one variable encompassing the total number of hours participants indicated they spent on social media a day and then split into quartiles.

COVID-19 Related Social Media Behaviors and Experiences.
We asked participants to consider how often they had engaged in or experienced 13 different behaviors/experiences via social media (5-point Likert scale; *never* to *every day*) during the last week while experiencing the COVID-19 pandemic. A factor analysis was conducted between the 13 variables and three major factors were retained: Emotions and Personal Connections, Passive Engagement with COVID-19 Content, and Active Engagement with COVID-19 Content (see Table 2). Scales maintained the 5-point Likert categories.

Mental health
To understand participants' current anxiety, depression, and stress levels, the Depression Anxiety and Stress Scales (DASS-21; 21-item measure; 4-pt Likert scale) was completed (see Crawford & Henry, 2003; Lovibond & Lovibond, 1995). The scoring process resulted in three scores (anxiety, depression, and stress) by summing the scores, multiplying by two, and then categorizing the summed results by severity (*normal, mild, moderate, severe, extremely severe*; α = 0.93).

Loneliness
To measure participants' levels of loneliness, we used the Three-Item Loneliness Scale (T-ILS; 3-point Likert scale; see Hughes et al., 2004; Matthews-Ewald & Zullig, 2013). The scores were summed (α =0.83), with higher scores indicating a higher degree of loneliness; scores were then categorized as being either *lonely* or *not lonely*.

Analysis

Data were analyzed in SAS, version 9.4 (SAS Institute, Cary, NC, USA). Univariate analyses were conducted for all variables to summarize mean, standard deviations, frequencies, and percentages. Three separate models were built between each outcome (anxiety, stress, and depression) and covariates with a *p*-value <0.20 were considered for the multivariable model. Each model was built using a forward stepwise modeling

strategy and variables were retained if $p < 0.05$. We considered both two-way interactions and main effects for each final model.

Results

We built three separate models for anxiety, depression, and stress. Table 1 and Table 3 include descriptive information about each of the outcome variables and covariates included in the models. Table 4 includes the model results.

Table 2. *Factor Loadings Related to Social Media Behaviors and Experiences During the Early Weeks of the COVID-19 Pandemic*

Items	Emotions and personal connections (6 items, α= .83)	Passive engagement with COVID-19 content (4 items, α= .79)	Active engagement with COVID-19 content (3 items, α= .81)
Reached out to someone you were concerned about	**0.375**	-0.230	0.030
Reached out to someone in order to feel close, connected, or together	**0.430**	-0.200	-0.082
Looked for something humorous to make myself feel better	**0.175**	0.1199	-0.145
Felt more depressed or anxious using social media	**0.109**	0.0783	-0.060
Used as a resource for activities/ideas during social distancing (e.g., personal, activities for kids)	**0.257**	-0.076	-0.020
Used a direct messaging feature to have conversations	**0.219**	-0.010	-0.033
Read someone else's post about the Coronavirus/Pandemic	-0.226	**0.431**	0.0275
Read news updates about the Coronavirus/Pandemic	-0.138	**0.363**	-0.021
Accessed social media out of boredom	-0.085	**0.375**	-0.136
Used as a resource for information in your own community (e.g., closures, access supplies)	0.076	**0.129**	-0.011
Made personal post about the Coronavirus/Pandemic	-0.030	-0.152	**0.449**
Liked a post about the Coronavirus/Pandemic	-0.173	0.127	**0.362**
Commented on a post about the Coronavirus/Pandemic	-0.054	-0.093	**0.450**

Note. Participants were asked to report during the last week, while experiencing the COVID-19 pandemic, how often they engaged in specific social media behaviors or experiences (*n* = 13 items). All scales had 5-point Likert response choices: *Never, Almost never, Occasionally, Almost Every Day,* and *Everyday*

Table 3. *Descriptive Statistics of Mental Health, COVID-19, and Social Media Variables*

Variable	Total N= 564, *n*(%)
Mental Health Variables	
Stress	
Normal	415 (73.58)
Mild	65 (11.52)
Moderate	41 (7.27)
Severe	35 (6.21)
Extremely Severe	8 (1.42)
Anxiety	
Normal	410 (72.70)
Mild	38 (6.74)
Moderate	60 (10.64)
Severe	22 (3.90)
Extremely Severe	34 (6.03)
Depression	
Normal	375 (66.49)
Mild	71 (12.59)
Moderate	78 (13.83)
Severe	22 (3.90)
Extremely Severe	18 (3.19)
Loneliness	
Not Lonely	391 (69.33)
Lonely	173 (30.67)
COVID-19 Variables	
Social Distancing	
I do not worry about staying in my residence and go a variety of places	16 (2.84)
I stay in my residence as much as possible, but have to go to work	86 (15.25)
I leave my residence for essential trips (e.g., groceries, medical, caregiving) and exercise	410 (72.70)
I am on full lockdown and do not leave my residence	52 (9.22)
Concern for COVID-19	
Not concerned	14 (2.49)
Slightly concerned	82 (14.56)
Somewhat concerned	119 (21.14)
Moderately concerned	177 (31.44)
Extremely concerned	171 (30.37)
Underlying risk factor for COVID-19	
No	470 (83.33)
Yes	94 (16.67)

Variable	Total N= 564, n(%)
Social Media Variables	
Emotions and Personal Connections Scale	
Never	51 (9.04)
Almost never	135 (23.94)
Occasionally	219 (38.83)
Almost every day	149 (26.42)
Everyday	10 (1.77)
Passive Engagement with COVID-19 Content Scale	
Never	25 (4.43)
Almost never	56 (9.93)
Occasionally	157 (27.84)
Almost every day	255 (45.21)
Everyday	71 (12.59)
Active Engagement with COVID-19 Content Scale	
Never	205 (36.35)
Almost never	155 (27.48)
Occasionally	142 (25.18)
Almost every day	53 (9.40)
Everyday	9 (1.60)
Average Total Time Spent on Social Media (across platforms) per day	
4 hours or less per day	163 (28.90)
More than 4 hours–8 hours a day	127 (22.52)
More than 8 hours–12.5 hours a day	139 (24.65)
More than 12.5 hours a day	135 (23.94)

Table 4. *Social Media Behaviors and Experiences During COVID-19: Adjusted Effects Between Anxiety, Stress, and Depression and Covariates*

Variable	Anxiety Outcome Odds Ratio (Confidence Interval)	Stress Outcome Odds Ratio (Confidence Interval)	Depression Outcome Odds Ratio (Confidence Interval)
Emotions and Personal Connections via Social Media			
Never	---	Ref.	Ref.
Almost never		0.848 (0.329, 2.185)	1.036 (0.444, 2.417)
Occasionally		1.363 (0.567, 3.275)	2.059 (0.916, 4.632)
Almost every day		2.086 (0.849, 5.126)	2.256 (0.967, 5.263)
Everyday		4.737 (1.140, 19.675)	4.622 (1.123, 19.024)
Loneliness			
Not Lonely	Ref.	Ref.	Ref.
Lonely	2.140 (1.412, 3.243)	2.097 (1.402, 3.138)	4.131 (2.815, 6.061)
Age			
18−35	Ref.	Ref.	Ref.
36−55	0.712 (0.456, 1.111)	0.736 (0.481, 1.122)	0.513 (0.341, 0.773)
56+	0.376 (0.178, 0.795)	0.229 (0.146, 0.611)	0.308 (0.164, 0.577)
Social Distancing			
I am on full lockdown and do not leave my residence	---	---	Ref.
I leave my residence for essential trips			0.359 (0.202, 0.913)
I stay in my residence as much as possible, but have to go to work			0.446 (0.218, 0.913)
I do not worry about staying in my residence and go a variety of places			0.314 (0.090, 1.094)
Sexual Orientation			
Heterosexual	Ref.	---	Ref.
Sexual minority	3.407 (1.483, 7.824)		2.624 (1.122, 6.141)

Variable	Anxiety Outcome Odds Ratio (Confidence Interval)	Stress Outcome Odds Ratio (Confidence Interval)	Depression Outcome Odds Ratio (Confidence Interval)
Concern for COVID-19			
Extremely concerned	Ref.	Ref.	
Moderately concerned	0.591 (0.368, 0.950)	0.598 (0.378, 0.946)	---
Somewhat concerned	0.220 (0.113, 0.432)	0.257 (0.135, 0.490)	
Slightly concerned	0.174 (0.078, 0.390)	0.414 (0.212, 0.810)	
Not concerned	0.456 (0.116, 1.793)	0.500 (0.124, 0.810)	
Gender			
Male	---	---	Ref.
Female			0.478 (0.315, .0726)
Race/Ethnicity		---	
White	---		Ref.
All other race/ethnicities			0.505 (0.297, 0.857)
Active Engagement with COVID-19 Content by Gender			
Female			
Never	Ref.		
Almost never	1.252 (0.619, 2.533)		
Occasionally	1.982 (1.010, 3.888)	---	---
Almost every day	1.343 (0.458, 3.715)		
Everyday	0.488 (0.049, 4.821)		
Male			
Never	Ref.		
Almost never	1.194 (0.454, 3.1420)		
Occasionally	2.808 (1.186, 6.647)		
Almost every day	10.715 (3.896, 29.470)		
Everyday	3.968 (0.284, 55.475)		

Anxiety.

Together, concern for COVID-19, sexual orientation, loneliness, age, and an interaction between age and active engagement with COVID-19 content on social media were significantly related to higher anxiety (see Table 4). The relationship between active engagement with social media content about COVID-19 and higher anxiety was dependent on gender. For example, both males and females who actively engaged with COVID-19 social media content occasionally were about two times more likely to experience higher levels of anxiety compared to those who never actively engaged with COVID-19 social media content, but males who actively engaged with COVID-19 content on social media almost every day were more than 10 times more likely to experience higher rates of anxiety compared to males who never actively engaged with COVID-19 social media content. There was not a significant relationship in anxiety levels between female participants who never actively engaged with COVID-19 content on social media and those who did almost every day.

Stress.

Concern for COVID-19, loneliness, age, and those who had emotional experiences and made personal connections on social media during the pandemic were together associated with higher levels of stress (see Table 4). Participants who had emotional experiences via social media and used it for connection every day were almost five times as likely to have higher levels of stress compared to those who did not experience social media this way during the early weeks of the pandemic.

Depression.

Together, loneliness, age, sexual orientation, gender, ethnicity, having emotional experiences, and making personal connections on social media during the early weeks of the pandemic were associated with higher levels of depression (see Table 4). Participants who had emotional experiences via social media and used it for connection every day were almost five times as likely to have higher levels of depression compared to those who did not experience social media this way during the early weeks of the pandemic.

Discussion

The current study explored the potential relationship between social media experiences and behaviors and anxiety, depression, and stress during the early weeks of the COVID-19 pandemic. There have been mixed results regarding the relationship between mental health and social media during nonpandemic times (Pantic, 2014). Vannucci et al. (2017) identified that greater social media use was related to higher levels of anxiety. In the present study, those who occasionally actively engaged with COVID-19 content (liked, commented, or created a post) were more likely to experience higher levels of anxiety than those who never engaged in COVID-19-related social media behaviors. Further, in terms of experiences with elevated stress and depression, participants who reported experiencing emotional reactions via social media or using it to connect with people during the pandemic were more susceptible to higher levels of stress and depression.

The cross-sectional design does not allow for the determining directionality of these findings. Previous research with people diagnosed with serious mental health illnesses and their use of social media found that social media use was not related to psychiatric symptoms, which may imply that social media does not make symptoms worse (Brusilovskiy et al., 2016). Another recent study identified that young adults who had high levels of anxiety and depression were more likely to consider using social media for support (over parents and mental health professionals), but they also reported that social media could be stress inducing (Drouin et al., 2018). As such, emotional experiences and connecting personally through social media during pandemics may elevate symptoms of stress and depression and also provide a venue to receive social support. Longitudinal research is needed.

Limitations and Conclusions

There are limitations to this study. While appropriate for an exploratory study, the study relied on a nonprobability sampling procedure and the sample was homogenous in terms of race, which limits the generalizability of the results. Interestingly, males and underrepresented racial groups were less likely to have higher depression than women and those identifying as White. This is contradictory to most research on depression and emerging research on depression during the pandemic (Ettman et al., 2020). This contradiction may be explained by sampling procedure limitations, which led to recruitment of people who were highly educated, mostly employed, and who had higher incomes. Pandemic research on depression highlights that those with lower economic resources and stressors were susceptible to higher levels of depression (Ettman et al., 2020). Future replication studies using random sampling procedures and specific studies related to the experiences of social media use by individuals with low resources during public health crises are warranted. However, adults use social media across demographic characteristics (Perrin & Anderson, 2019; Pew Research Center, 2019), and people of all resource levels have experienced the pandemic, which means the current results should not be discounted but considered in the context of the limitations.

In terms of study strengths, the study did move social media and public health crisis research beyond the examination of existing posts for accuracy/inaccuracy of health-based information and focused on user experiences. The current study captured the specific experiences and behaviors on social media as reported by people who were experiencing the early weeks of the COVID-19 pandemic. The current study suggests that during the early weeks of the pandemic, specific behaviors and experiences via social media were related to anxiety, stress, and depression. Early in the pandemic, some scholars recommended limiting time on social media as a method of preventing mental health declines (Kar et al., 2020). Results from the current study provide some preliminary support for this recommendation, and limiting time spent on social media during public health crises may be a way to protect mental health.

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