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Depression, Anxiety, and Stress Severity Impact Social Media Use and TikTok Addiction

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ABSTRACT

Introduction: Previous research has found a correlation between social media use and mental health illnesses in adolescents. However, very little research has been conducted about the correlation between TikTok use and mental health illnesses. Additionally, little is known concerning the differences in social media usage among varying levels of mental health illness, age groups, and genders. **Purpose:** The purpose of this report was to identify the relationship between mental health illnesses and social media and TikTok use. **Methods:** An online survey was administered in April/May 2022 to a snowballing convenience sample. Questions investigated mental health (stress, anxiety, and depression) and social media use, with a focus on TikTok. **Results:** Of the 295 participants, 67.8% identified as women and 57.3% claimed to use TikTok. The participants were primarily Caucasian (77.1%) and aged 18-25 years old (69.9%), with the mean age of participants being 29.58. Higher rates of depression, anxiety, and stress were positively correlated with more social media use and TikTok addiction. Younger individuals were also more likely to score higher on the social media scales. Females, as well as individuals with severe depression/anxiety/stress scored higher on social media use than males and individuals with normal levels; however, an interaction between gender and social media use was not found. Additionally, individuals with severe depression/anxiety/stress scored higher on TikTok addiction than individuals with normal levels. However, due to the small subset of male and older participants indicating TikTok use, gender and age interactions on this scale could not be examined. **Implications:** The current results agree with previous research in suggesting that there is a positive correlation between social media use, including TikTok addiction and mental health illnesses. However, future research is needed to determine the effects of gender and age

on the TikTok addiction and mental health illnesses. Continuation of research in this nature could validate previous studies that have shown a difference in the prevalence of mental health illnesses between genders, as well as identify additional risk factors for mental health illnesses.

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INTRODUCTION

The nature, causes, and treatment of mental health have been thoroughly discussed throughout history. Mental illness, an umbrella term for any illness with symptoms that may influence an individual's thoughts, feelings, or behaviors (Better Health Channel, 2015), can make it difficult for an individual to cope with stressful activities throughout life, including work and relationships (Better Health Channel, 2015). The scale of mental illnesses across the globe is very wide. According to the World Health Organization (2019), approximately 1 in 8 people around the world have a mental health diagnosis, with depressive and anxiety disorders being the most common (WHO, 2022). These rates are not equivalent across ages or genders, and they are often impacted by external factors (Houghton et al., 2018).

For some individuals, these illnesses can be very taxing and can lead to interference with typical daily routines. In fact, a previous study indicated that, out of the top ten contributors to global years lived with a disability, five were mental disorders (Patel & Prince, 2010). Additionally, a previous study found that mental health disorders often go untreated and are typically associated with serious role impairment (The WHO World Mental Health Survey Consortium, 2004). This highlights the need for further understanding of the factors contributing to mental illnesses.

General Mental Health – Depression, Anxiety, and Stress

Anxiety, depression, and stress are three comorbid internalizing mental health illnesses (Ali et al., 2021; Moore et al., 2016). Since 2020, we have seen increased rates of all three across ages and genders (Ali et al., 2021). These mental health illnesses have impacted a wide variety of individuals; however, the prevalence of internalizing mental health illnesses seems to be highest amongst adolescents and females (Zahn-Waxler et al., 2000).

Social Media Use and Mental Health

In an effort to understand the potential causes of mental illnesses, this paper will investigate the impacts of social media use on mental health issues. Social media can be defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan & Haenlein, 2010), and includes platforms such as Twitter, Facebook, YouTube, and Instagram. The prevalence of social media use is extremely high, with approximately three-quarters of all US adults have been online and about 90% of individuals aged 12-24 having been online (Jones & Fox, 2020). While each individual has their own reasoning for using social media, previous research has found the most common uses to be social interaction, information seeking, and passing the time (Whiting & Williams, 2013). Despite an individual's reasoning for using social media, the high prevalence of social media use within the United States has led to the question on whether or not social media use can lead to or impact mental health problems. Previous studies have found a correlation between social media use and negative mental health; however, these studies have largely focused on younger populations (Beeres et al., 2021; Houghton et al., 2018; Orben & Przybyski, 2019).

TikTok

A more specific social media application that has been used significantly in recent years is the viral application TikTok. This application is commonly used for the creation and sharing of short videos. Although this application is fairly new, it is already a major social media application with more than 78.7 million active users within the U.S. (Ceci et al., 2022). However, not much research has been conducted on the impacts of TikTok use on mental health issues.

Thus, not only will this paper cover the impacts of general social media use on mental health, but it will also cover the impacts of TikTok use on mental health.

Current Study

The aim of the current study was to further support, and expand upon, previous research by testing the relationship between social media use and mental health, with a focus on TikTok use. Several hypotheses were formulated on the basis of the increase of social media use and mental health disorders, as well as the differences in mental health across ages and genders. The following seven hypotheses were proposed: 1) There would be a positive correlation between mental health outcomes (depression, anxiety, stress) and social media use (H1a), and there would be a positive correlation between mental health outcomes and TikTok addiction (H1b); 2) There would be a negative correlation between age and social media use (H2a), as well as TikTok addiction (H2b); 3) Social media use would be more prevalent in female participants than male participants (H3a), and female participants would score higher on the TikTok addiction scale (H3b); 4) Social media use (H4a), and TikTok addiction (H4b), would be more prevalent in participants who have severe anxiety, stress, and depression compared to participants who have normal or mild/moderate levels; 5) There would be a gender by mental health (depression, anxiety, stress) interaction, such that females with severe anxiety/depression/stress would have the most social media use (H5a) and TikTok addiction (H5b); 6) Social media use would be more prevalent in Gen Z participants than other generations (H6a), and Gen Z participants would score higher on the TikTok addiction scale (H6b) and lastly; 7) There would be a generation by mental health (depression, anxiety, stress) interaction, such that Gen Z participants with severe anxiety/depression/stress would have the most social media use (H7a) and TikTok addiction (H7b).

METHODS

Participants and Procedure

This cross-sectional study examined the relationships between mental health, social media use, age, and gender. Data was collected via an online survey that was administered for two weeks in April-May 2022. This survey was distributed to a convenience sample that allowed participants to then share the link through social media networks (mainly Facebook) and electronic communication, resulting in a snowball sample. An online research description directed recipients to a Qualtrics link, which contained the study information, consent form, and the survey. All study procedures were approved by the Institutional Review Board at the University of Tennessee, Knoxville, and a total of 295 participants were recruited. Of the 295 participants, 200 (67.8%) identified as women and 82 (27.8%) identified as being male. Participants in the study were also primarily Caucasian (n = 225, 76.3%) with a mean age of 29.58 (SD = 15.12; for additional demographic information, see Table 1).

Table 1. Descriptive statistics for participants ($N = 295$)

Variable	Valid N^1	n (%)
Age, n (%)	289	
18-25 (Gen Z)		202 (69.9)
26-41 (Millennials/Gen Y)		25 (8.7)
42-57 (Gen X)		38 (13.1)
58+ (Baby Boomers and Silent Generation)		24 (8.3)
Gender, n (% Female)	292	200 (67.8)
Uses TikTok, n (%)	291	169 (57.3)
Race, n (%)	292	
Caucasion/European-American		225 (77.1)
Black/African-American		20 (6.8)
American Indian or Alaskan Native		2 (0.7)
Asian		6 (2.1)
Hispanic		20 (6.8)
Multiracial		13 (4.5)

Other	6 (2.1)

Note. 1 = valid *N* represents the number of participants used to complete the analysis.

Measures

      Demographics. Several questions were asked to measure participants demographics such as age, gender, and race/ethnicity. In analyses that examined gender differences, gender was restricted to male and female responses due to too few responses in additional categories. Age was used as both a continuous and categorical variable. Age was broken into four discrete categories: 18-25 (Gen Z), 26-41 (Millennials/Gen Y), 42-57 (Gen X), and 58+ (Baby boomers & the Silent Generation). Baby boomers and the silent generation were combined for analysis due to low response rates.

      Depression, Anxiety, and Stress Scale (DASS-21). The Depression, Anxiety, and Stress Scale-21 is a shortened version of the original 42-item self-report questionnaire designed to measure three related emotional states: depression, anxiety, and stress (cite). This scale has been used globally and has been validated in both clinical (Antony et al., 1998) and non-clinical (Sinclair et al., 2011) studies. Each seven-item subscale is scored on a four-point Likert-style scale ranging from (0) *did not apply to me at all* to *(3) applied* to *me very much or most of the time*, with higher scores indicating higher severity of the associated mental health problem. The DASS-21 measures depression on the basis of hopelessness and devaluation of life; anxiety on the basis of autonomic arousal and situational anxiety; and stress on the basis of nervous arousal and ease of emotional negativity. Each emotional state is also broken into clinical severity

categories using predetermined cutoff points (Peters et al., 2021), allowing the variable to be used as both continuous and categorical variables.

Perceived Stress Scale (PSS). The Perceived Stress Scale is a four-item self-report questionnaire designed to measure the degree to which an individual perceives their life situations as stressful (Cohen et al., 1983). The items are scored on a five-point Likert scale ranging from *(0) never* to *(4) very often*, with higher scores indicating higher perceived stress.

Social Media Use Integration Scale (SMUIS). The Social Media Use Integration Scale is a ten-item five-point Likert scale designed to measure engaged social media use and the integration of social media use into an individual's habits (Jenkins-Guarnieri et al., 2012). This scale was originally created to measure Facebook use; however, it has been adapted to measure all social media use. Higher scores indicate higher levels of social media use.

Smartphone Addiction Scale – Short version (SAS-SV). The Smartphone Addiction Scale – Short Version is a shortened version of the original Smartphone Addiction Scale intended for the evaluation of smartphone addiction (Kwon et al., 2013). This scale operates on a six-point Likert scale ranging from *(1) strongly disagree* to *(6) strongly agree*. This scale was modified for TikTok use via replacement of "smartphone" with "TikTok," with higher scales indicating higher levels of TikTok addiction.

Data Analysis

Correlations were used to examine the relationship between age (as a continuous variable), Depression, Anxiety, Stress, Social Media Use, and TikTok addiction (Hypotheses 1 & 2). Three 3X2 analyses of variance were conducted to assess whether mental health (depression, anxiety, and stress) and social media use would be higher in participants who identified as women (H3a, H4a, H5a). One-way ANOVAs were used to determine if there were group

differences (depression, anxiety, stress) on TikTok addiction (H3b, H4b). Unfortunately, the hypothesized interactions between gender and mental health on TikTok addiction (H5b) could not be examined due to small group sizes. Researchers were able to use a one-way ANOVA to examine the relationship between age and social media use (H6a), but too few older adults used TikTok for age and TikTok addiction (H6b) to be examined. Similarly, the hypothesized interactions between age and mental health on social media use (H7a) and TikTok addiction (H7b) could not be examined due to small group sizes. All analyses were performed using IBM SPSS statistics, version 27 and all statistical tests used a significance level of 0.05.

RESULTS

Hypotheses 1 and 2

The first hypothesis was that as general social media use increased, depression, anxiety, and stress levels would also increase. Similarly, it was believed that as TikTok addiction increased, depression, anxiety, and stress levels would also increase. These hypotheses were supported; as expected, there were significant positive correlations between social media, and specifically TikTok, use and depression, anxiety, and stress (see Table 2). It was also hypothesized (H2) that there would be a negative correlation between age and social media use/TikTok addiction. As expected, there was a significant negative correlation between age and social media use and age and TikTok addiction, $r(279) = -.217$, $p < .001$ and $r(162) = -.351$, $p < .001$, respectively.

Table 2. Correlations

Variable	SMIUS	BSMAS	SAS_SV	Anxiety	Depression	Stress	Perceived Stress
1. SMIUS	--	0.605	0.394	0.242	0.222	0.276	0.207
2. BSMAS		--	0.683	0.366	0.324	0.432	0.408

3. SAS_SV	--	0.378	0.313	0.377	0.298
4. Anxiety		--	0.734	0.806	0.643
5. Depression			--	0.773	0.747
6. Stress				--	0.659
7. Perceived Stress					--

Mean

SD

Note. *$p < .001$

Hypotheses 3, 4, and 5

It was hypothesized that there would be gender by mental health (depression, anxiety, and stress) interactions on both social media use and TikTok addiction, such that females with severe/extremely severe depression/anxiety/stress would score the highest on social media use and TikTok addiction. Three 3X2 analyses of variance were conducted to examine the effects of gender on mental health (depression, anxiety, and stress) on social media use.

A 3X2 analysis of variance was conducted to examine the effects of gender and depression on social media use. A main effect for depression was detected, $F(2, 266) = 4.366$, $p = .014$, *partial η^2* = .032. Participants with Severe/extremely severe depression ($M = 30.477$, *SE* = 1.689, 95% CI [27.151, 33.803]) had a significantly higher score on social media use than participants with normal depression levels ($M = 25.798$, *SE* = .745, 95% CI [24.332, 27.264]). There were no differences between participants with mild/moderate depression ($M = 28.603$, *SE* = 1.160, 95% CI [26.319, 30.886]) and other groups. There was also a main effect for gender, $F(1, 266) = 4.622$, $p = .032$, *partial η^2* = .017, indicating that female participants scored higher on social media use than males. Additionally, there was not a significant interaction between gender and depression on social media use, $F(2, 266) = .511$, $p = .600$, *partial η^2* = .004.

Another 3X2 analysis of variance was conducted to examine the effects of gender and anxiety on social media use. A main effect for anxiety was detected, $F(2, 266) = 3.452$, $p = .033$, *partial* $\eta^2 = .025$. Results revealed that there were trends between participants with normal anxiety levels ($M = 26.107$, $SE = .712$, 95% CI [24.706, 27.508]) compared to those with mild/moderate ($M = 29.916$, $SE = 1.498$, 95% CI [26.966, 32.866]) and severe/extremely severe anxiety ($M = 28.928$, $SE = 1.531$, 95% CI [25.914, 31.943]). Unfortunately, there was no main effect for gender, $F(1, 266) = 3.138$, $p = .078$, *partial* $\eta^2 = .012$, or a significant interaction between gender and anxiety on social media use, $F(2, 266) = 1.139$, $p = .322$, *partial* $\eta^2 = .008$.

A third 3X2 ANOVA was conducted to examine the effects of gender and stress on social media use. Main effects were found for both stress and gender, $F(2, 266) = 7.653$, $p < .001$, *partial* $\eta^2 = .054$ and $F(1, 266) = 4.695$, $p = .031$, *partial* $\eta^2 = .017$, respectively. Participants with normal stress levels ($M = 25.504$, $SE = .724$, 95% CI [24.079, 26.928]) scored lower on social media use than participants with mild/moderate stress levels ($M = 30.525$, $SE = 1.064$, 95% CI [28.430, 32.620]). There were no differences between participants with severe/extremely severe stress ($M = 26.174$, $SE = 3.177$, 95% CI [19.918, 32.430]) and other groups. Additionally, there was a trend when examining the interaction between gender and stress on social media use, $F(2, 266) = 3.003$, $p = .051$, *partial* $\eta^2 = .022$. Simple effects analyses revealed females with normal ($M = 28.043$, $SE = .889$, 95% CI [26.292, 29.793]) and severe/extremely severe stress ($M = 31.348$, $SE = 1.797$, 95% CI [27.809, 34.887]) scored higher on the social media use scale than males with the same stress levels ($M = 22.965$, $SE = 1.142$, 95% CI [20.717, 25.213]; $M = 21.000$, $SE = 6.095$, 95% CI [8.999, 33.001]). There were no significant differences between male ($M = 30.810$, $SE = 1.881$, 95% CI [27.106, 34.513]) and female ($M = 30.240$, $SE = .995$, 95% CI [28.280, 32.200]) participants with mild/moderate stress levels.

Unfortunately, only a small subset of male participants indicated that they used TikTok, and therefore the gender analyses and interactions on TikTok use were not appropriate tests due to small group sizes. Instead, three one-way ANOVAs were run with depression, anxiety, and stress as the grouping variables and TikTok addiction as the dependent variable. For each test, it was hypothesized that participants with more severe mental health would score higher on the TikTok addiction scale. A one-way analysis of variance was conducted to examine the effect of depression group on TikTok addiction. A significant difference was detected between the normal ($M = 19.309$, $SD = 8.777$) compared to mild/moderate ($M = 24.455$, $SD = 8.830$) and severe/extremely severe conditions ($M = 25.049$, $SD = 10.592$), $F(2, 163) = 7.167$, $p = .001$, $\eta^2 = .081$.

Another one-way analysis of variance was conducted to examine the effect of anxiety group on TikTok addiction. A significant difference was detected between the normal ($M = 18.94$, $SD = 8.784$) compared to mild/moderate ($M = 24.784$, $SD = 8.104$) and severe/extremely severe conditions ($M = 25.375$, $SD = 10.412$), $F(2, 163) = 9.588$, $p < .001$, $\eta^2 = .105$. Lastly, there was a significant effect of stress group on TikTok addiction, $F(2, 163) = 8.159$, $p < .001$, $\eta^2 = .091$. Normal ($M = 19.5139$, $SD = 9.184$) and mild/moderate ($M = 22.895$, $SD = 8.748$) stress groups were statistically different compared to the severe/extremely severe conditions ($M = 29.000$, $SD = 11.172$).

Hypotheses 6 and 7

It was hypothesized that social media use would be more prevalent in Gen Z participants than other generations (H6a), and Gen Z participants would score higher on the TikTok addiction scale (H6b). A one-way analysis of variance was conducted to examine the effect of age group on social media use. A significant difference was detected between Gen Z ($M = 29.313$, $SD =$

8.980) compared to Gen X ($M = 24.351$, $SD = 9.148$); however, no differences were found among Gen Y ($M = 28.000$, $SD = 8.211$) and baby boomers ($M = 24.364$, $SD = 8.544$), $F(3, 275) = 4.689$, $p = .003$, $\eta^2 = .049$. Unfortunately, only a small subset of participants were classified as being any generation other than Gen Z, especially among those who used TikTok, and therefore the age analyses for the TikTok addiction scale were not appropriate due to small group sizes. Similarly, the hypothesized interactions between age and mental health on social media use (H7a) and TikTok addiction (H7b) could not be examined due to small group sizes.

DISCUSSION

The aim of this study was to examine the relationship between social media use and mental health illnesses. There were seven hypotheses made before carrying out this research. First, it was hypothesized that 1) There would be a positive correlation between mental health outcomes (depression, anxiety, stress) and social media use (H1a), and there would be a positive correlation between mental health outcomes and TikTok addiction (H1b); and 2) There would be a negative correlation between age and social media use (H2a), as well as TikTok addiction (H2b). The results of the present study supported that there is a significant positive correlation between mental health outcomes and social media, especially TikTok, use, supporting the first hypothesis. As expected, the correlation was stronger when looking specifically at TikTok use. This agrees with previous research that has found a positive correlation between social media use and mental health illnesses (Beeres et al., 2021; Houghton et al., 2018; Orben & Przybyski, 2019); however, rather than focusing on adolescents, this study expanded this knowledge to individuals over the age of eighteen. As expected, this study also found a significant negative correlation between age and social media use as well as TikTok addiction, supporting the second hypothesis. This supports

previous research that states that older participants tended to use social media and exhibit addiction to TikTok at less extremes than younger participants (Auxier & Anderson, 2021).

Next, it was hypothesized that 3) Social media use would be more prevalent in female participants than male participants (H3a), and female participants would score higher on the TikTok addiction scale (H3b); 4) Social media use (H4a), and TikTok addiction (H4b), would be more prevalent in participants who have severe anxiety, stress, and depression compared to participants who have normal or mild/moderate levels; and 5) There would be a gender by mental health (depression, anxiety, stress) interaction, such that females with severe anxiety/depression/stress would have the most social media use (H5a) and TikTok addiction (H5b). Females were found to score higher on social media use than males, supporting the third hypothesis. However, this study was not able to support the hypothesis that females would score higher on the TikTok addiction scale due to the low number of males who indicated that they use TikTok. Because there was not a comparable number of male and female participants, a difference in gender in relation to TikTok addiction was not found. Additionally, there was not a significant interaction between gender and depression or anxiety on social media use. However, a significant interaction was found between gender and stress on social media use, with females exhibiting normal and severe/extremely severe stress scoring higher on the social media use scale than males with the same stress levels. While there was not a significant interaction between depression and social media use nor between anxiety and social media use, this study found a significant difference between depression and TikTok addiction as well as between anxiety and TikTok addiction, with individuals exhibiting severe/extremely severe conditions also exhibiting higher levels of TikTok addiction. As expected, the same results were found between stress and TikTok addiction.

The final two hypotheses of this study were that 6) Social media use would be more prevalent in Gen Z participants than other generations (H6a), and Gen Z participants would score higher on the TikTok addiction scale (H6b) and lastly; 7) There would be a generation by mental health (depression, anxiety, stress) interaction, such that Gen Z participants with severe anxiety/depression/stress would have the most social media use (H7a) and TikTok addiction (H7b). When investigating social media use, this study found a significant difference between Gen Z participants in comparison to Gen X participants; however, there was no significant difference among Gen Y participants and baby boomers. This is likely due to the overwhelming proportion of participants belonging to Gen Z, especially among those who used TikTok. Thus, an appropriate comparison among age groups on the TikTok addiction scale was not found due to small group sizes. The same held true when investigating mental health interaction and social media use among the different age groups.

The main limitation of this study was the lack of variability among the sample. The majority of participants were females, aged 18-25 years old. While the results of this study did support many of the hypotheses, some were unable to be supported due to the lower number of male participants and participants of older age groups. When analyzing TikTok addiction, there were too few men using TikTok to properly investigate the interaction between gender and TikTok addiction. This could be investigated more by widening the sample size; however, it could simply be a representation of the demographic of who actually uses this platform. For future research regarding social media use and TikTok addiction, valuable information could be found by using a more targeted approach for sampling. This study took a general sample of adults over the age of 18; however, due to the method of distribution of the survey, many of the participants were young adult females.

The primary results of this study indicate that social media use and TikTok addiction are associated with negative mental health outcomes. From this study, we can conclude that younger generations tend to use social media more frequently than older generations, just as females tend to use social media more frequently than males. Additionally, we now know that TikTok addiction correlates with higher levels of depression, anxiety, and stress. This is important when discussing the rising frequency of negative mental health outcomes in society. With younger generations using social media frequently, and the significant correlation between social media use and negative mental health outcomes, those who use social media frequently might be more at risk of developing negative mental health outcomes than those who do not. Though most of the information regarding general social media use found supports previous studies, we now have a better understanding of the relationship between TikTok addiction and negative mental health outcomes. Now that a relationship has been found, future studies should investigate why this relationship exists, as well as what can be done to mitigate negative mental health outcomes when interacting with social media and TikTok.

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