

Social Identity, Social Media Use, and Mental Health in Adults: Investigating the Mediating Role of Cyberbullying Experiences and the Moderating Effects of Gender and Age

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Purpose: Previous research points to a complex relation between social media use and mental health, with open questions remaining with respect to mediation pathways and potential sociodemographic moderators. The present research investigated the extent to which experiences of cyberbullying victimization mediate the link between greater social media use and poorer mental health in adults and whether such indirect effects are moderated by gender or age.

Participants and Methods: As part of a larger study, US adults ($N = 502$) completed an online survey that included measures of degree of social media use, cyberbullying victimization, depression, anxiety, substance use, and sociodemographic characteristics including gender and age.

Results: A series of moderated mediation models revealed a robust indirect effect of cyberbullying victimization on the relation between degree of social media use and mental health, such that greater social media use was associated with higher levels of cyberbullying victimization and greater cyberbullying victimization was associated with increased depression, anxiety, and likelihood of substance use. There was no evidence that the mediation effects varied between men and women. Age did, however, moderate the mediation effects for anxiety and likelihood of substance use, with stronger mediation effects emerging for younger compared to older adults.

Conclusion: Our findings underscore the importance of empirical investigations that shed a more nuanced light on the complex relation between social media and mental health.

Keywords: social media, cyberbullying, depression, anxiety, substance use, gender, age

Introduction

Evidenced by the rise in social media use across broad segments of the world population,¹ social media platforms have become an integral aspect of daily life. The pervasiveness of social media and increased use among teens, in particular,^{2,3} has prompted considerable empirical investigation of the link between social media use and mental health. Notably, however, the research has yielded mixed results—with some studies documenting a link between greater social media use and poorer mental health and well-being,⁴⁻⁶ and others illuminating psychological benefits of social media use.⁷⁻⁹ This seeming inconsistency underscores the complexity of the association between social media and mental health, with factors such as type of and motive for social media use and characteristics of individual users shedding light on the more nuanced effects of social media. In the present study, we focus on social media use as a predictor of three specific indicators of poorer mental health—depression, anxiety, and substance use—and investigate the extent to which factors including cyberbullying experiences, gender, and age contribute to complexity in the link between social media use and mental health.

Greater social media use, broadly, has been associated with increased depression, anxiety, and substance use. In a large longitudinal study of young adults, for example, greater daily social media use at baseline predicted an increased likelihood of depressive symptoms approximately six months later.¹⁰ In a meta-analysis of 14 different studies, greater social media use—assessed by daily hours of social media use, frequency of use, and/or degree of social media engagement—emerged as a significant predictor of greater substance use among adolescents.¹¹ Yet, other studies have found that the link between social media use and mental health varies depending on type of and motives for use. To illustrate, passive social media use (eg, scrolling through content without directly engaging with others) has been associated with an increased likelihood of depression, whereas active social media use (eg, posting status updates) has been associated with a decreased likelihood of depression.^{12,13} Other more nuanced findings stem from research investigating problematic types of social media use, including social media addiction,¹⁴ fear of missing out,¹⁵ and emotional investment in social media.¹⁶ More frequent and intense social media use and indicators of social media addiction have, for instance, been linked with heightened social anxiety in young adults¹⁷ and a greater likelihood of substance use among teens.¹⁸

One phenomenon relevant to social media use that has been associated with adverse mental health outcomes is cyberbullying^{19,20}—ie, interpersonal aggression involving the use of technology to intentionally threaten, tease, insult, or harass others.^{21,22} Systematic reviews have identified a host of negative psychological correlates of cyberbullying,^{19,23–25} ranging from loneliness, academic difficulties,^{26,27} and substance use²⁸ to depression and suicide,^{29–31} anxiety,³² and post-traumatic stress disorder.^{33,34} Whereas much of the cyberbullying literature has examined youth and adolescent populations, similar findings have emerged in research with adults.^{22,35–40} Additionally, cyberbullying victimization in adulthood is associated with counterproductive work behavior and lower job satisfaction,⁴¹ lower job engagement and job performance,⁴² and higher job attrition.⁴³

The extent to which experiences of cyberbullying victimization help to explain the link between social media use and mental health hinges in part on a positive correlation between social media use and cyberbullying. Indeed, greater internet and social media use is a reliable predictor of increased rates of cyberbullying victimization among adolescents,^{19,24,44} college students,^{44–47} and adults.³⁹ Moreover, in a large sample of 11 to 20 year-olds ($N = 5,126$), cyberbullying victimization mediated the relation between social media use and psychological distress and suicidal thoughts and behavior.⁴⁸ We are unaware of any studies showing that the relation between social media use and mental health is mediated by cyberbullying victimization among adults in the general population; however, this indirect effect seems likely given the established links between adult social media use and cyberbullying victimization, on one hand, and between adult cyberbullying victimization and poorer mental health, on the other hand.^{39,44}

Adding to the complexity of the relations among social media use, cyberbullying, and mental health are socio-demographic characteristics, which have been associated with different patterns of social media use, rates of cyberbullying, and mental health outcomes. For example, adult women are more likely to experience cyberbullying victimization than men,^{49,50} and a stronger link has been found between cyberbullying victimization and depression among adolescent girls than boys,^{19,30} in part due to their greater social media use.⁵¹ Interestingly, an opposite pattern has been documented in research with adults, such that the correlation between cyberbullying victimization and both depression and anxiety was found to be stronger in men compared to women and was particularly high among men who reported greater social media use.³⁹

Age is another sociodemographic characteristic that may affect the relations among social media use, cyberbullying, and mental health. Both degree of social media use⁵² and the prevalence of cyberbullying victimization and online harassment are higher in younger compared to older adults.⁵³ Some research has found that the risk of depression after cyberbullying increases from early adolescence to early adulthood, due partly to increasingly complex life events and greater access to social media during this time.³⁰ Prior studies have also found that greater daily social media use is more strongly related to cyberbullying and depression in adults compared to adolescents.^{4,5} A large-scale investigation of the link between cyberbullying and mental health across the lifespan ($N = 31,907$), however, found an opposite trend. Cyberbullying victimization was associated with poorer mental health, impairment in one's daily life due to mental problems, and alcohol and substance use across the sample, but the strength of these associations was moderated by age. The association was strongest among adolescents and became weaker throughout later stages of adulthood.³⁶

Present Research

In the present study, we sought to examine the extent to which sociodemographic characteristics—gender and age, in particular—moderate the interrelations among social media use, experiences of cyberbullying, and mental health in adults. We expected that higher degrees of social media use (including both active and passive social media activities) would correspond with indicators of poorer mental health (eg, greater depression, anxiety, and substance use). We further predicted that this association would be mediated by greater experiences with cyberbullying victimization—that is, higher degrees of social media use would correspond with an increased likelihood of cyberbullying victimization and greater cyberbullying victimization would, in turn, correspond with poorer mental health. Finally, we predicted that this indirect effect would be moderated by both gender and age, such that the effect would be stronger for men than women and for younger compared to older adults.

Materials and Methods

Participants and Procedure

As part of a larger online survey exploring aspects of social media use and mental health, adult participants ($N = 502$) completed measures of degree of social media use, cyberbullying victimization, mental health, and sociodemographic variables via Prolific.com. The study was conducted in adherence with the ethical standards for research established by the Declaration of Helsinki and received prior approval from the Institutional Review Board at Arizona State University. Eligibility criteria included residence in the US, fluency in English, and being at least 18 years old. All participants provided informed consent prior to taking part in the study. See Table 1 for additional information about the demographic composition of the sample.

Table 1 Participant Demographics

N	502
Age	
Mean	32.58
SD	12.76
Range	18-80
Missing	3 (0.6%)
Gender	
Cisgender man	227 (45.2%)
Cisgender woman	232 (46.2%)
Transgender man	2 (0.4%)
Transgender woman	3 (0.6%)
Non-binary	18 (3.6%)
Prefer not to answer	8 (1.6%)
Other	12 (2.4%)
Sexual Orientation	
Lesbian/Gay	25 (5.0%)
Bisexual	84 (16.7%)
Questioning	11 (2.2%)
Heterosexual	357 (71.1%)
Prefer not to answer	9 (1.8%)
Other	15 (3.0%)
Missing	1 (0.2%)

(Continued)

Table 1 (Continued).

N	502
Race	
White or European American	357 (71.1%)
Black or African American	36 (7.2%)
Hispanic or Latinx	54 (10.8%)
American Indian or Alaska Native	11 (2.2%)
Asian or Asian American	65 (12.9%)
Native Hawaiian or Pacific Islander	3 (0.6%)
Multiracial	18 (3.6%)
Prefer not to answer	3 (0.6%)
Other	3 (0.6%)
Education Level	
Some high school	4 (0.8%)
High school degree or equivalent	67 (13.3%)
Some college, without degree	160 (31.9%)
Associate's (2-year degree)	43 (8.6%)
Bachelor's (4-year degree)	160 (31.9%)
Graduate degree	66 (13.1%)
Other	2 (0.4%)
Annual Household Income	
Less than \$25,000	102 (20.3%)
\$25,000 - 34,999	68 (13.5%)
\$35,000 - 49,999	67 (13.3%)
\$50,000 - 74,999	98 (19.5%)
\$75,000 - 99,999	61 (12.2%)
\$100,000 - 149,999	54 (10.8%)
\$150,000 - 199,999	29 (5.8%)
\$200,000 or more	22 (4.4%)
Missing	1 (0.2%)

Measures

Degree of Social Media Use

Degree of social media use was assessed using the Passive and Active Social Media Use Scale (PASMU),¹² on which participants indicated how often they engage in seven social media behaviors—read discussions, read comments/reviews, watch videos or view pictures, share others' content, like/favorite/vote, comment on or respond to someone else's content, and post your own content—with responses measured on a 6-point scale from *never* to *several times a day*. Given meta-analytic evidence calling into question the utility of the active versus passive use distinction,¹⁰ we created a composite index of degree of (active and passive) social media use by averaging all seven items ($\alpha = .80$), with higher values reflecting greater social media use.

Cyberbullying Victimization

We measured cyberbullying victimization using seven items adapted from previous research^{39,54} assessing the extent to which participants had experienced each of the following in their life: “someone posted mean or hurtful comments about me on or using social media”, “someone posted a mean or hurtful picture of me on or using social media”, “someone posted a mean or hurtful video of me on or using social media”, “someone created a mean or hurtful social media group or page about me”, “someone spread rumors about me on or using social media”, “someone threatened to hurt me on or using social media”, “someone pretended to be me on or using social media to cause harm.” Responses were measured

on a 5-point scale from *never* to *many times*. Given adequate reliability ($\alpha = .83$), the items were averaged to create a composite variable, with higher scores reflecting greater cyberbullying victimization.

Depression

Symptoms of depression were assessed with the 7-item Center for Epidemiological Studies Depression Scale – Short Form (CES-D-SF)^{55,56}—which asks participants to report the frequency of depressive symptoms they may have experienced within the past week (eg, “I felt that I could not shake off the blues even with help from my family or friends”, “I thought my life had been a failure”)—with responses measured on a 4-point scale ranging from *rarely or none of the time (less than 1 day)* to *most or all of the time (5-7 days)*. The items ($\alpha = .89$) were averaged to create a composite variable, with higher scores reflecting higher levels of depression.

Anxiety

Anxiety was assessed with the 21-item Beck Anxiety Inventory (BAI)⁵⁷—which asks participants to report how often they were bothered by symptoms of anxiety (eg, unable to relax, nervous) in the past month—with responses measured on a 4-point scale ranging from *not at all* to *severely, it bothered me a lot*. The items ($\alpha = .94$) were averaged to create a composite variable, with higher scores reflecting higher levels of anxiety.

Substance Use

Substance use was assessed using the 4-item CAGE-AID Questionnaire.^{58,59} Specifically, participants were asked about the frequency of problematic alcohol or drug use (eg, “When was the last time you felt guilty about your drinking or drug use?”), with responses measured on a 6-point scale from *never* to *within the past month*. The items ($\alpha = .86$) were averaged to create a composite variable, with higher scores reflecting greater substance use.

Sociodemographic Variables

Participants were asked to indicate their age, gender, race/ethnicity, sexual orientation, highest level of education, and annual household income for the previous year. See Table 1 for demographic question response options.

Attention Checks

Two attention checks were administered,⁶⁰ with failure of both checks established as the criteria for exclusion. Two participants failed the first attention check and one participant failed the second check. No participant, however, failed more than one attention check—thus, the full sample ($N = 502$) was retained.

Results

Descriptive statistics and bivariate correlations for the key study variables are shown in Table 2. We performed a series of regression analyses to investigate (1) the extent to which degree of social media use predicted poorer mental health (depression, anxiety, and substance use), (2) whether experiences of cyberbullying victimization mediated such effects, and (3) whether any indirect effects varied by gender or age. Specifically, we tested separate moderated mediation models using Model 8 of the PROCESS macro (v4.3)⁶¹ in SPSS v.28, with the standard error of the indirect effect calculated based on 50,000 bootstrapped samples. For each model, degree of social media use was entered as the predictor, a mental

Table 2 Descriptives and Bivariate Correlations for Key Study Variables

		M	SD	1	2	3	4	5	6
1	Age	32.58	12.76	–					
2	Degree of Social Media Use	4.03	0.99	-0.12**	–				
3	Cyberbullying Victimization	1.39	0.55	-0.17**	0.27**	0.19**	–		
4	Depression	2.19	0.79	-0.15**	0.26**	0.27**	0.19**	–	
5	Anxiety	1.69	0.59	-0.27**	0.17**	0.31**	0.29**	0.60**	–
6	Substance Use	1.77	1.28	0.02	0.02	0.09*	0.22**	0.27**	0.22**

Notes: ** $p < .01$, * $p < .05$.

health indicator was entered as the outcome variable, cyberbullying victimization was entered as the mediator, and either gender or age was entered as a potential moderator of the indirect effect.

For the analyses with gender as the moderator, only cisgender men and women were included ($n = 459$); for the analyses with age as the moderator, participants who chose not to report their age ($n = 3$) were excluded, yielding a sample size of $N = 499$. Prior to performing the key analyses, we investigated the normality of the distribution of cyberbullying victimization, depression, anxiety, and substance use values in the full sample to ensure the appropriateness of ordinary least squares regression. Only the distribution of substance use scores appeared problematic. More than half of the sample indicated a response of *never* on all four items assessing substance use ($n = 291$, 58%). We thus converted the substance use composite to a dichotomous variable, with a value of 0 indicating no substance use ($n = 291$) and a value of 1 indicating a response of greater than *never* on at least one of the four items ($n = 201$). We performed logistic regression for the analyses with substance use as the outcome variable.

Depression

In the model examining gender as a moderator of the potential indirect effect of cyberbullying victimization on the relation between degree of social media use and depression, evidence of mediation did emerge. As expected, greater social media use was associated with higher levels of cyberbullying victimization, $a = 0.16$, $SE = 0.03$, $t(455) = 6.11$, $p < 0.0001$, and greater cyberbullying victimization was associated with greater depression (controlling for social media use), $b = 0.23$, $SE = 0.07$, $t(454) = 3.50$, $p = 0.0005$. As indicated by the nonsignificant index of moderated mediation (IMM), however, neither the direct relation between social media use and depression nor the mediation effect varied as a function of gender. In other words, cyberbullying victimization mediated the link between social media use and depression similarly for men and women. The indirect effects for both genders and the index of moderated mediation are shown in Table 3.

In the model examining age as a moderator of the indirect effect of cyberbullying victimization on the relation between social media use and depression, evidence of mediation once again emerged, such that greater social media use was associated with higher levels of cyberbullying victimization, $a = 0.15$, $SE = 0.02$, $t(495) = 6.00$, $p < 0.0001$, and greater cyberbullying victimization was associated with higher levels of depression, $b = 0.18$, $SE = 0.07$, $t(494) = 2.78$, $p = 0.006$. Neither the direct relation between social media use and depression nor the mediation effect varied as a function of age, as reflected in a nonsignificant index of moderated mediation. That is, cyberbullying victimization mediated the link between social media use and depression to a similar extent regardless of participants' age. The indirect effects at the 16th (21 years), 50th (29 years), and 84th (46 years) percentiles for age and the index of moderated mediation are shown in Table 4.

Anxiety

In the model examining gender as a moderator of the potential indirect effect of cyberbullying victimization on the relation between social media use and anxiety, evidence of mediation was found, such that greater social media

Table 3 Gender as Moderator of the Indirect Effect

	Women	Men
Social Media Use > CB Victimization > Depression <i>IMM</i> = 0.00, <i>SE</i> = 0.01, 95% CI: -0.01, 0.03	<i>ab</i> = 0.19, <i>SE</i> = 0.05, 95% CI: 0.09, 0.29	<i>ab</i> = 0.12, <i>SE</i> = 0.05, 95% CI: 0.02, 0.22
Social Media Use > CB Victimization > Anxiety <i>IMM</i> = 0.01, <i>SE</i> = 0.01, 95% CI: -0.02, 0.04	<i>ab</i> = 0.05, <i>SE</i> = 0.01, 95% CI: 0.03, 0.08	<i>ab</i> = 0.05, <i>SE</i> = 0.01, 95% CI: 0.03, 0.08
Social Media Use > CB Victimization > Substance Use <i>IMM</i> = 0.02, <i>SE</i> = 0.03, 95% CI: -0.05, 0.08	<i>ab</i> = 0.10, <i>SE</i> = 0.04, 95% CI: 0.04, 0.19	<i>ab</i> = 0.12, <i>SE</i> = 0.04, 95% CI: 0.05, 0.21

Notes: *ab* = indirect effect; $N = 459$.

Abbreviations: CB victimization, cyberbullying victimization; *IMM*, index of moderated mediation; *SE*, standard error; CI, confidence interval.

Table 4 Age as Moderator of the Indirect Effect

	Age (16th Percentile = 21 Years)	Age (50th Percentile = 29 Years)	Age (84th percentile = 46 years)
Social Media Use > CB Victimization > Depression <i>IMM</i> = -0.00, <i>SE</i> = 0.00, 95% CI: -0.00, 0.00	<i>ab</i> = 0.03, <i>SE</i> = 0.01, 95% CI: 0.01, 0.06	<i>ab</i> = 0.03, <i>SE</i> = 0.01, 95% CI: 0.01, 0.05	<i>ab</i> = 0.02, <i>SE</i> = 0.01, 95% CI: 0.01, 0.04
Social Media Use > CB Victimization > Anxiety <i>IMM</i> = -0.0007,* <i>SE</i> = 0.0003, 95% CI: -0.0014, -0.0001	<i>ab</i> = 0.04, <i>SE</i> = 0.01, 95% CI: 0.02, 0.07	<i>ab</i> = 0.04, <i>SE</i> = 0.01, 95% CI: 0.02, 0.06	<i>ab</i> = 0.03, <i>SE</i> = 0.01, 95% CI: 0.01, 0.04
Social Media Use > CB Victimization > Substance Use <i>IMM</i> = -0.0022,* <i>SE</i> = 0.0011, 95% CI: -0.0048, -0.0003	<i>ab</i> = 0.14, <i>SE</i> = 0.04, 95% CI: 0.07, 0.24	<i>ab</i> = 0.13, <i>SE</i> = 0.04, 95% CI: 0.07, 0.21	<i>ab</i> = 0.09, <i>SE</i> = 0.03, 95% CI: 0.04, 0.15

Notes: *ab* = indirect effect; *N* = 499; **p* < .05.

Abbreviations: CB victimization, cyberbullying victimization; *IMM*, index of moderated mediation; *SE*, standard error; CI, confidence interval.

use was associated with higher levels of cyberbullying victimization, $a = 0.16$, $SE = 0.03$, $t(455) = 6.11$, $p < 0.0001$, and greater cyberbullying victimization was associated with higher levels of anxiety, $b = 0.33$, $SE = 0.05$, $t(454) = 6.91$, $p < 0.0001$. Neither the direct relation between social media use and anxiety nor the mediation effect varied as a function of gender, as reflected in a nonsignificant index of moderated mediation. Cyberbullying victimization thus mediated the link between social media use and anxiety similarly for men and women (see Table 3).

In the model examining age as a moderator of the indirect effect of cyberbullying victimization on the relation between social media use and anxiety, evidence of mediation emerged, with greater social media use associated with higher levels of cyberbullying victimization, $a = 0.15$, $SE = 0.02$, $t(495) = 6.00$, $p < 0.0001$, and greater cyberbullying victimization associated with higher levels of anxiety, $b = 0.23$, $SE = 0.05$, $t(494) = 4.91$, $p < 0.0001$. Crucially, there was evidence that the magnitude of the indirect effect varied as a function of age, reflected in a significant index of moderated mediation. As shown in Table 4, while evident across all ages, the mediation effect was significantly stronger for relatively younger compared to older participants.

Substance Use

In the model examining gender as a moderator of the indirect effect of cyberbullying victimization on the relation between social media use and likelihood of substance use, evidence of mediation was once again found, such that greater social media use was associated with higher levels of cyberbullying victimization, $a = 0.15$, $SE = 0.03$, $t(454) = 6.07$, $p < 0.0001$, and greater cyberbullying victimization was associated with a higher likelihood of substance use, $b = 0.70$, $SE = 0.20$, $z = 3.49$, $p = 0.0005$ (where b reflects the log-transformed odds of any level of problematic substance use compared to no problematic substance use). Neither the direct relation between social media use and the likelihood of substance use nor the mediation effect varied as a function of gender, as reflected in a nonsignificant index of moderated mediation. Cyberbullying victimization thus mediated the link between social media use and likelihood of substance use similarly for men and women (see Table 3).

Finally, in the model examining age as a moderator of the indirect effect of cyberbullying victimization on the relation between social media use and likelihood of substance use, evidence of mediation again emerged, such that greater social media use was associated with higher levels of cyberbullying victimization, $a = 0.15$, $SE = 0.02$, $t(454) = 6.00$, $p < 0.0001$, and greater cyberbullying victimization was associated with a greater likelihood of substance use, $b = 0.81$, $SE = 0.19$, $z = 4.18$, $p < 0.0001$. Critically, the magnitude of the indirect effect was found to vary as a function of age, indicated by the significant index of moderated mediation. As shown in Table 4, while evident across all ages, the mediation effect was significantly stronger for relatively younger compared to older participants.

Discussion

In a sample of US adults, higher degrees of social media use were associated with indicators of poorer mental health, including greater depression and anxiety and an increased likelihood of substance use. Furthermore, the association between social media use and mental health was robustly mediated by increased experiences of cyberbullying victimization. That is, cyberbullying victimization helped to explain the link between greater social media use and each of the three mental health outcomes of interest, regardless of participants' gender or age. Contrary to predictions, however, the magnitude of these indirect effects did not vary between cisgender men and women. Although age did not moderate the indirect effect for depression, it did moderate the indirect effects for anxiety and the likelihood of substance use. Specifically, there was a significantly stronger mediation pathway for younger (compared to older) adults with respect to anxiety and substance use. These findings point to the importance of considering (some) sociodemographic characteristics in investigations of these phenomena.

We had expected to find a stronger indirect effect for men than women, based on previous research documenting a stronger link between cyberbullying victimization and mental health outcomes in adult men than adult women.³⁹ Our results instead suggest that the increased experiences of cyberbullying victimization associated with greater social media use and the link between cyberbullying and adverse mental health outcomes may provide comparable levels of explanatory value for men and women. This finding is somewhat surprising, given parallels in the size and demographic

composition of the research samples and measures of depression and anxiety administered in the present study and the prior studies on which our gender hypothesis was based. Although unexpected, the robustness of the indirect effect across genders is also intriguing in light of post-hoc exploratory analyses we performed that revealed gender differences in social media use, depression, anxiety, and likelihood of substance use in our sample. Specifically, women reported greater social media use, depression, and anxiety than men, whereas men were 1.43 times as likely as women to report some level of substance use. These findings suggest that, despite underlying gender differences in degree of social media use and mental health outcomes, there appears to be utility in investigations of both men and women that consider cyberbullying experiences.

As predicted, the mediation pathway through cyberbullying victimization was stronger for younger compared to older adults when looking at anxiety and likelihood of substance use. These findings may offer complementary insights to previous studies showing a heightened risk of anxiety following cyberbullying experiences,⁶² and prior research documenting enhanced stress, anger, and self-guilt following cybervictimization⁶³—ie, significant predictors of substance use⁶⁴—among young (college-aged) adults. It is less clear why evidence of age-based moderated mediation did not emerge in the analysis for depression, given the increased risk of depressive symptoms from cyberbullying victimization in the transition from adolescence to early adulthood,³⁰ previous work indicating that the link between cyberbullying and depression becomes weaker throughout later stages of adulthood,³⁶ and the strong positive correlation between depression and anxiety in our sample ($r = .60, p < 0.01$).

There were several limitations of the present study that warrant mention and elucidate important directions for future research. For instance, the cross-sectional design of the current study precludes the ability to make inferences about causality and the directional relationships among variables. Notably, whereas some have argued against mediation analyses with cross-sectional data,⁶⁵ others have highlighted the utility of explanatory mechanisms in the absence of causal inference.⁶¹ Although we see benefit in mediation analyses in cross-sectional data, the correlational nature of our findings is a considerable limitation. It is thus imperative that future research using longitudinal designs be performed to gain crucial insights about causality.

Another limitation stems from the predominantly White / European American, cisgender, and heterosexual composition of our sample. In fact, in our analyses investigating gender as a moderator, we focused exclusively on cisgender men and women. Clearly, future studies with more demographically and culturally diverse samples are needed to improve the generalizability of the present findings and because of the vital insights more global and heterogeneous samples can provide. Relatedly, given the increased prevalence of cyberbullying and online harassment targeting gender, sexual, and ethnic minorities^{66–68} and well-documented mental health disparities that disproportionately impact these sociodemographic groups,^{69,70} research that sheds light on these marginalized populations is imperative.

Conclusion

Given the pervasiveness of social media in the daily lives of broad segments of the population, research that contributes to the understanding of the link between social media use and mental health has become increasingly important. The growing body of research in this area has yielded mixed findings, largely due to complexities in how and why people use social media. The present study examined the role of cyberbullying experiences in the link between social media use and depression, anxiety, and substance use in adults and the extent to which sociodemographic factors might moderate these effects. The findings further underscore the benefit of empirical investigations that shed a more nuanced light on the complex relations between social media and mental health.

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