

UCSF

UC San Francisco Previously Published Works

Title

Active Social Media Use and Health Indicators Among Sexual and Gender Minority Adults

Permalink

<https://escholarship.org/uc/item/30w4w10n>

Authors

Vogel, Erin A

Flentje, Annesa

Lunn, Mitchell R

et al.

Publication Date

2023-12-28

DOI

10.1089/lgbt.2023.0170

Supplemental Material

<https://escholarship.org/uc/item/30w4w10n#supplemental>

Peer reviewed

## Active Social Media Use and Health Indicators among Sexual and Gender Minority Adults

Erin A. Vogel, PhD<sup>1\*</sup>, Annesa Flentje, PhD<sup>2,3,4</sup>, Mitchell R. Lunn, MD, MAS<sup>4,5,6</sup>, Juno Obedin-Maliver, MD, MPH, MAS<sup>4,6,7</sup>, Matthew R. Capriotti, PhD<sup>8</sup>, Danielle E. Ramo, PhD<sup>9</sup>, Judith J. Prochaska, PhD, MPH<sup>1</sup>

<sup>1</sup>Stanford Prevention Research Center, Department of Medicine, Stanford University; Stanford, California, USA

<sup>2</sup>Department of Community Health Systems, School of Nursing, University of California San Francisco; San Francisco, California, USA

<sup>3</sup>Alliance Health Project, Department of Psychiatry and Behavioral Sciences, School of Medicine, University of California San Francisco; San Francisco, California, USA

<sup>4</sup>The PRIDE Study/PRIDENet, Stanford University School of Medicine; Stanford, California, USA

<sup>5</sup>Division of Nephrology, Department of Medicine, Stanford University School of Medicine; Stanford, California, USA

<sup>6</sup>Department of Epidemiology and Population Health, Stanford University School of Medicine; Stanford, California, USA

<sup>7</sup>Department of Obstetrics and Gynecology, Stanford University School of Medicine; Stanford, California, USA

<sup>8</sup>Department of Psychology, San Jose State University; San Jose, California, USA

<sup>9</sup>BeMe Health; Marblehead, Massachusetts, USA

\*Current affiliations: 1) TSET Health Promotion Research Center, University of Oklahoma Health Sciences Center; Oklahoma City, Oklahoma, USA; 2) Department of Pediatrics, University of Oklahoma Health Sciences Center; Oklahoma City, Oklahoma, USA

**Running Title:** ACTIVE SOCIAL MEDIA USE AND HEALTH

**Keywords:** LGBTQ; sexual minority; gender minority; social media; social support

**Corresponding author:** Erin A. Vogel, PhD, University of Oklahoma Health Sciences Center, TSET Health Promotion Research Center, 655 Research Parkway, Suite 400, Oklahoma City, OK 73104.

*Phone:* (405) 271-8001 x 50493      *Email:* [erin-vogel@ouhsc.edu](mailto:erin-vogel@ouhsc.edu)

Abstract: 250 words    Text: 3,203 words    Tables: 3    Figures: 0    Supplementary materials: 5 tables

## Abstract

**Purpose:** Sexual and gender minority (SGM) individuals may receive social support through using social media actively (i.e., posting, interacting). This study examined associations between active social media use, social support, and health indicators in a large sample of SGM adults in the United States. **Methods:** Data were derived from the 2017 wave of The PRIDE Study, a national cohort study of SGM health. SGM-identified adults reporting social media use (N=5,995) completed measures of active social media use, social support, depressive symptoms, cigarette smoking, hazardous drinking, sleep, and physical activity. Regression models examined main and interactive effects of active social media use and social support on health indicators. **Results:** The sample reported a moderate level of active social media use (mean [M]=3.2[1.0], scale=1-5) and relatively high social support (M=16.7[3.3], scale=4-20); 31.8% reported moderate-to-severe depressive symptoms. Participants with greater active social media use were more likely to experience depressive symptoms (adjusted odds ratio [AOR]=1.18, 95% confidence interval [CI] [1.10, 1.26]), cigarette smoking (AOR=1.11, 95% CI[1.01, 1.22]), insufficient sleep (AOR=1.13, 95% CI[1.06, 1.21]), and physical inactivity (AOR=1.09, 95% CI[1.02, 1.15]) than those with less active social media use. Active social media use did not significantly interact with social support to predict any health indicators (p-values>.159). **Conclusion:** Among SGM adults, active social media use was associated with several negative health indicators. Active social media use may increase health risks, or SGM adults with poor health may use social media actively to maintain social connections. Moderate active social media use may be compatible with health.

## Introduction

Social media has emerged as a common platform for social interactions with 70% of United States (U.S.) adults reporting social media use.<sup>1</sup> Greater social media use is associated with negative mental and physical health indicators, such as depressive symptoms,<sup>2</sup> physical inactivity,<sup>3</sup> and poor sleep.<sup>4</sup> Moreover, social media content portraying alcohol and tobacco use in a positive light is abundant and may encourage substance use.<sup>5-9</sup> Negative associations between social media use and well-being may be partially explained by factors such as social comparison to idealized versions of others<sup>10</sup> and spending time on social media instead of engaging in more rewarding activities.<sup>11</sup>

However, social media use is not uniformly negative. Social media can help fulfill social support needs and health-related needs for marginalized individuals.<sup>12,13</sup> Sexual and gender minority (SGM) individuals face prejudice and discrimination, with negative effects on physical and mental health that may be partially mitigated by social support.<sup>14,15</sup> Social media may facilitate social support by enabling connection with others who have shared experiences, including those who are geographically distant. SGM individuals may experience greater social capital (i.e., forming and maintaining connections with others) from social media use than their non-SGM peers, but they may experience also greater negative emotions and negative effects on relationships.<sup>16</sup> In sum, positive and negative health-related experiences may accompany social media use among SGM individuals.

The balance of positive and negative health correlates of social media use may be partially determined by the extent to which SGM individuals use social media actively (i.e., posting content or communicating with others, versus passively browsing)<sup>17</sup> and how much social support they perceive themselves to have. Research suggests that active social media use is associated with feelings of social connectedness and subjective well-being.<sup>18</sup> However, individuals with greater-than-average active social media use, who check their social media accounts more frequently and interact with others on social media more frequently than do those with less active use, may experience more benefits from social media use, but also more harms.<sup>19</sup>

Health correlates of active social media use have not yet been explored among SGM individuals, for whom support-seeking may be a predominant motivator of social media use.<sup>20</sup> Positive interpersonal experiences on social media (e.g., receiving support) may be health-promoting, while negative experiences

(e.g., cyberbullying) may be health-harming.<sup>20</sup> SGM individuals with more social support, whether received online or offline, are less likely to have problematic social media use (i.e., addiction-like use patterns<sup>21</sup>) than those with less support.<sup>22</sup>

Active social media use itself can lead to social support,<sup>18,23</sup> and stress is less strongly associated with anxiety symptoms among those who receive more support online.<sup>24</sup> Moreover, individuals with high social support may be less likely to draw on social media as a primary source of social support, instead using social media to supplement their offline interactions with their support system.<sup>25</sup> Individuals with inadequate social support may be more vulnerable to the harmful effects of active social media use, such as seeking social support on social media and not receiving it, which can be distressing.<sup>26,27</sup> Feeling unsupported is a component of minority stress experienced by many SGM individuals, and may result in mental health symptoms (e.g., depressive symptoms) and coping strategies that can contribute to poor health (e.g., substance use).<sup>28,29</sup>

This study aimed to better understand the relationship between active social media use, social support, and well-being among SGM adults. Five health indicators related to well-being were examined: depressive symptoms, cigarette smoking, hazardous drinking, sleep, and physical activity. Data were from The Population Research in Identity and Disparities for Equality (PRIDE) Study, a large, national prospective, longitudinal cohort study of the physical, mental, and social health of SGM adults. We hypothesized an interaction between active social media use and social support on health indicators. Specifically, we predicted that active social media use would be associated with better health indicators among those with higher social support and worse health indicators among those with lower social support.

## **Methods**

### **Participants and Design**

Participants were recruited for The PRIDE Study. The first phase of The PRIDE Study, which began in June 2015, was a community listening phase in which SGM community members shared their priorities and concerns.<sup>30</sup> The second phase, a cohort study, began in 2017. Cohort study participants are invited to complete annual surveys and other topic-specific studies by logging on to an authenticated portal through any

web-enabled device. Ongoing community involvement is facilitated by PRIDEnet, a network of individuals and organizations that provide input into the study design, analysis, and dissemination.

Self-identified SGM adults (18 years or older) who reside in the U.S. or its territories can join The PRIDE Study through a secure web platform designed, hosted, and maintained by The PRIDE Study.<sup>31</sup> Informed consent is obtained from all participants. Recruitment methods include digital and print media, social media, in-person and digital SGM-focused and SGM-serving events, and facilitated contact with SGM people through PRIDEnet's ~32 member Community Partner Consortium, Participant Advisory Committee, and Ambassadors.<sup>32</sup> The PRIDE Study and the current analysis were approved by the University of California, San Francisco, Stanford University School of Medicine, and WCG Institutional Review Boards. The present analysis used data from the first wave of the cohort study and included participants who reported using at least one social media platform.

## Measures

**Social media use.** Participants reported whether they had a profile on seven social media platforms popular at the time of the study, selecting all applicable options (Facebook, Google+, Instagram, LinkedIn, Pinterest, Snapchat, Twitter) or "none of these." Participants who selected "none of these" are not included in the analytic sample for the present analysis. To measure active social media use, participants indicated their agreement (1 = completely not true; 5 = completely true) with five items: "I am very active in social networking sites," "I often comment on friends' posts or statuses," "I rarely interact with others on social networking sites" (reverse-scored), and "I am relatively passive in social networking sites" (reverse-scored). A mean score was computed, with higher scores indicating greater active social media use.

**Emotional social support.** With 4 items, the Patient-Reported Outcomes Measurement Information System (PROMIS) Perceived Emotional Support Scale assesses perceptions of having someone to listen and feeling appreciated (1 = never, 5 = always).<sup>33</sup> Responses were summed with higher scores indicating greater perceived social support.

**Health indicators.** Depressive symptoms were measured with the Patient Health Questionnaire-9 (PHQ-9); scores of 10 or higher indicated moderate-to-severe depressive symptoms.<sup>34</sup> Cigarette smoking was

indicated by having smoked at least 100 cigarettes in one's lifetime (yes/no) and currently smoking "some days" or "every day" (versus "not at all").<sup>35</sup> Hazardous drinking was measured with the 10-item Alcohol Use Identification Test (AUDIT);<sup>36</sup> scores were dichotomized with scores of 8 or higher indicating hazardous drinking.<sup>37</sup> Sleep was dichotomized according to whether participants met minimum National Sleep Foundation guidelines for adults (7 hours per night).<sup>38</sup> Physical activity was dichotomized according to whether guidelines were met (150+ minutes per week of moderate activity or equivalent; each vigorous minute equals two moderate minutes).<sup>39</sup>

**Sociodemographic characteristics.** Participants self-reported their age, sex assigned at birth (male or female), race (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White, another race), and ethnicity (Hispanic or non-Hispanic). Participants were able to select all applicable race, sexual orientation, and gender identity descriptors to allow nuanced description. Sexual orientation descriptors included: asexual, bisexual, gay, lesbian, pansexual, queer, questioning, same-gender loving, straight/heterosexual, another sexual orientation. Gender identity descriptors included: genderqueer, man, transgender man, transgender woman, woman, another gender identity.

Gender was coded with a combination of identity descriptors and sex assigned at birth. Participants who identified exclusively as a man and were assigned male at birth were coded as cisgender men; those who identified exclusively as a woman and were assigned female at birth were coded as cisgender women. Individuals who identified as a man and were assigned female at birth, and/or identified as a transgender man, were coded as transgender men. Individuals who identified as a woman and were assigned male at birth, and/or identified as a transgender woman, were coded as transgender women. Gender-expansive participants identified as genderqueer and/or an unlisted gender identity and may have additionally endorsed binary gender descriptors.<sup>40</sup> Gender was not coded for the subset of participants who identified only as "man" or "woman" and did not report their sex assigned at birth, as it was not possible to determine whether they were cisgender or transgender.

## **Statistical Analysis**

The analytic sample consisted of individuals reporting use of at least one social media platform ( $N = 5,995$ ); 85 additional survey respondents reported they did not use social media and were excluded from analyses. Five logistic regression models tested the main and interactive effects of active social media use and emotional social support on health indicators (i.e., depressive symptoms, cigarette smoking, hazardous drinking, sleep, and physical activity). Step 1 of each model included several participant characteristics often associated with health: age, race and ethnicity, gender, and sexual orientation. All responses for race and sexual orientation were entered into the models with 0/1 coding (i.e., the participant endorsed the response or did not), as participants could endorse multiple responses for these items. Step 2 of each model included the main and interactive effects of active social media use and emotional social support on health indicators. Analyses were conducted with SPSS 29.0.

## Results

### Participant characteristics

Participant characteristics (analytic  $N = 5,995$ ) are displayed in Table 1. The sample had a median age of 28.7 years (interquartile range = 14.4); 31.0% were cisgender women, 22.1% cisgender men, 20.4% gender-expansive, 6.9% transgender men, and 3.6% transgender women. Most participants (83.0%) identified as White; 3.3% as Asian, 2.9% as Black or African American, 2.8% as another race not listed, 2.6% as American Indian or Alaska Native, and 0.4% as Native Hawaiian or Pacific Islander. Most participants reported using Facebook (96.3%), Instagram (67.1%), Twitter (62.4%), LinkedIn (61.0%), and Snapchat (52.6%); a minority used Google+ (43.7%) and Pinterest (44.1%). Participants used an average of 4.3 ( $SD=1.7$ ) of the seven platforms listed.

Overall, participants reported moderate active social media use ( $M=3.2$ ,  $SD=1.0$ ) on a scale from low (1) to high (5) active social media use. Social support was relatively high ( $M=16.7$ ,  $SD=3.3$ ; possible score range: 4-20). Nearly one in three participants (31.8%) reported moderate-to-severe depressive symptoms. The most common negative health behavior was physical inactivity (39.9%), followed by insufficient sleep (27.3%), hazardous drinking (14.5%), and cigarette smoking (9.6%). Table 2 shows correlations between measures.



Participants with greater active social media use had significantly greater social support, and most health indicators were modestly intercorrelated.

### **Active social media use, social support, and health indicators**

Table 3 shows associations of active social media use and social support with health indicators, adjusting for age, race, ethnicity, sexual orientation, and gender. Participants with greater active social media use were at greater risk for moderate-to-severe depressive symptoms (adjusted odds ratio [AOR]=1.18, 95% confidence interval [CI] [1.10, 1.26]), cigarette smoking (AOR=1.11, 95% CI [1.01, 1.22]), insufficient sleep (AOR=1.13, 95% CI [1.06, 1.21]), and physical inactivity (AOR=1.09, 95% CI [1.02, 1.15]). Social support was associated with lower risk of moderate-to-severe depressive symptoms (AOR=0.51, 95% CI [0.48, 0.55]), insufficient sleep (AOR=0.71, 95% CI [0.67, 0.76]), and physical inactivity (AOR=0.90, 95% CI [0.85, 0.96]). Social support did not significantly moderate associations of active social media use with any health indicators ( $p$ -values>0.159). Tables S1-S5 show full multivariable models, presenting estimates for each variable.

### **Discussion**

Although active social media use often confers benefits, research in the general adult population has identified potential harms.<sup>18,41</sup> We hypothesized that, among SGM adults, active social media use would be associated with positive health indicators only for those with high social support. Active social media use did not significantly interact with social support to predict health indicators among SGM adults; however, greater active social media use was associated with depressive symptoms, cigarette smoking, insufficient sleep, and physical inactivity.

Previous research found that although young adults with more active social media use experienced more benefits (i.e., greater social support, satisfaction with life, social connectedness, and meaning in life) than those with less active use, they also experienced more harms (i.e., stress, negative affect, loneliness, problematic social media use).<sup>19</sup> The literature similarly suggests associations of intense social media use with both lower and higher well-being, with little evidence to support the view that active social media use is mostly beneficial.<sup>18,42</sup> Problematic social media use, which can include spending a great deal of time using social

media actively,<sup>21</sup> has been linked to negative health indicators such as depressive symptoms,<sup>43</sup> poor sleep,<sup>44</sup> and physical inactivity<sup>45</sup> across diverse populations.

This study identified associations between the same poor health indicators and active—but not necessarily problematic—social media use. Individuals who are highly active on social media may be at risk for health consequences even if their use does not resemble the addiction-like patterns of problematic use. Additionally, we found that greater active social media use was associated with greater odds of cigarette smoking. Meta-analytic evidence suggests that exposure to tobacco-related social media content is associated with tobacco use among youth.<sup>46</sup> Tobacco-related content is pervasive on social media<sup>47-53</sup> and may also influence adults.

SGM individuals are already at higher risk than cisgender, heterosexual individuals for poor health resulting from marginalization.<sup>54</sup> This study suggests that SGM individuals who are highly engaged in active social media use may be especially likely to experience poor health indicators, regardless of how much social support they have. Numerous mechanisms may explain associations between active social media use and poorer health indicators, which may be bidirectional.

First, individuals whose social lives largely take place on social media may receive adequate support, but they may have more sedentary lifestyles<sup>3</sup> and disrupted sleep<sup>4</sup> than those with primarily offline social lives. Results suggested an association between active social media use and cigarette smoking, which disproportionately affects the SGM community.<sup>55</sup> Portrayals of tobacco use on social media may increase adults' beliefs that tobacco use may help them regulate their moods, thereby increasing their risk of tobacco use initiation.<sup>56</sup> Active social media use, including posting content and interacting with others, can cause depressive symptoms following experiences of rejection, cybervictimization, or insufficient validation.<sup>57-61</sup> Experiences in SGM-focused social media communities are not always free from discrimination or anti-SGM sentiment.<sup>62</sup>

Second, individuals with poorer physical and mental health may use social media to maintain social connections when their health limits in-person socializing. For such individuals, active social media use may be positive, enabling them to maintain their social support networks when they would otherwise be unable. For

example, some people with disabilities turned to social media for support during the COVID-19 pandemic to partially offset the doubly isolating effects of disability and pandemic precautions.<sup>63</sup> On average, participants with greater active social media use did report greater social support than those with less active use, which may include social support received on social media. Consistent with the literature showing a robust relationship between social support and health,<sup>64,65</sup> those with greater social support had better health indicators.

Finally, active social media use may be a marker of other risk factors for poor health that were unmeasured in this study. Analyses accounted for participants' age, gender, sexual orientation, race, and ethnicity. Additional characteristics may have affected both active social media use and health indicators.

Contrary to our hypothesis, active social media use did not significantly interact with social support in predicting health indicators. Consistent with prior literature, greater social support was associated with several positive health indicators (i.e., lower risk of depressive symptoms, insufficient sleep, and physical inactivity).<sup>64</sup> Our measure of social support did not distinguish between online and offline social support. Online and offline support may overlap for most individuals, who communicate with their support system using multiple means, as suggested by moderately strong correlations between the degree of online and offline social support.<sup>66</sup>

People with more offline social support may have healthier social media use because their social media networks are also offline contacts. Social networking with close friends carries a lower risk of harmful social comparison than does social networking with acquaintances.<sup>67</sup> As the digital world has increasingly melded into daily life, the distinction between online and offline communication may be more difficult for participants to make. This study captured social support holistically, not specific to one communication channel, and aims to provide an overall picture of participants' social support. Effect sizes of active social media use and social support were modest, and closer examination of online social support in relation to health indicators among SGM individuals is needed to better understand the role of online social support in SGM individuals' health.

### **Strengths, Limitations, and Future Directions**

Strengths of this sample include diversity in sexual orientation and gender identities and geographic representation across the United States. There are several noteworthy limitations. First, the survey did not

assess the total time spent on social media or problematic social media use. Survey items also did not differentiate between social support received through social media versus other sources, nor between SGM-specific and non-specific social support. Items measured the extent to which participants have someone with whom they can process feelings or problems and someone who makes them feel appreciated. Future research addressing social media and health among SGM adults could include more fine-grained measures, including items measuring social support for coping with minority stress.

Second, although participants were from across the United States, the sample was not nationally representative and most participants identified as White, thereby limiting generalizability of results. Individuals' multiple identities (e.g., gender identity, sexual identity, race, ethnicity) intersect to influence experiences of marginalization.<sup>68</sup> Multivariable models in this study suggested that risk of negative health indicators varied across identities. Replication in a sample with greater racial and ethnic diversity is needed to examine interactions of multiple identities on health-related outcomes.

Third, the survey measured seven social media platforms popular at the time of data collection. While most of them are still commonly used, newer platforms (e.g., TikTok) have emerged and become popular.<sup>69</sup> The image-based and video-based platforms that are currently popular (e.g., TikTok, Instagram, YouTube) may have stronger negative effects on health and well-being than platforms that include text-only posts (e.g., Facebook, Twitter).<sup>70</sup> Future research with an updated list of social media platforms would be informative. Finally, the cross-sectional, observational study design did not permit causal inference. Active social media use and health indicators may have reciprocal effects on one another, and longitudinal research is needed.

## **Conclusions**

Among SGM adults, active social media use was associated with depressive symptoms, cigarette smoking, insufficient sleep, and physical inactivity, regardless of social support. Active social media use may put SGM adults at risk for poor health indicators, or SGM adults with poorer health may engage in more active social media use to maintain their social connections. A moderate amount of active social media use may enable SGM adults to maintain social support networks without compromising their health. Clinicians providing physical or mental healthcare to SGM adults may inquire about time spent on social media and social support

gleaned from social media and discuss how social media may affect clients' health habits and outcomes. Parents and educators can assist SGM youth in developing healthy social media habits, cultivating social support both online and offline, and leading physically active lifestyles with moderate social media use.

## Acknowledgements

The PRIDE Study is a community-engaged research project that serves and is made possible by LGBTQ+ community involvement at multiple points in the research process, including the dissemination of findings. We acknowledge the courage and dedication of The PRIDE Study participants for sharing their stories; the careful attention of PRIDENet Participant Advisory Committee (PAC) members for reviewing and improving every study application; and the enthusiastic engagement of PRIDENet Ambassadors and Community Partners for bringing thoughtful perspectives as well as promoting enrollment and disseminating findings. For more information, please visit <https://pridestudy.org/pridenet>.

## Contributions

Conceptualization: EAV, AF, MRL, JO, MRC, DER, JJP. Formal analysis: EAV. Writing – original draft: EAV. Writing – review & editing: AF, MRL, JO, MRC, DER, JJP. Supervision: AF, MRL, JO, MRC. Project administration: AF, MRL, JO, MRC. Funding acquisition: AF, MRL, JO.

## Conflicts of Interest

**Disclosures:** Dr. Juno Obedin-Maliver has consulted for Sage Therapeutics (2017), Ibis Reproductive Health (2017-2018, 2020-present), Hims, Incorporated (2019-present), and Folx, Incorporated (2019-present) on topics unrelated to this work. Dr. Lunn has consulted for Hims, Incorporated (2019-present), Folx, Incorporated (2019-2021), Otsuka Pharmaceutical Development and Commercialization, Inc. (2023) on topics unrelated to this work. Dr. Capriotti is on the Clinical Advisory Board of Appa Health and receives honoraria and travel support for talks on behavioral treatment of Tourette Syndrome from the Tourette Association of America. None of these engagements influenced or are pertinent to the work described in this manuscript. Dr. Prochaska has served as an expert witness against tobacco companies in lawsuits and has provided consultation to pharmaceutical and technology companies that make medications and other treatments for quitting smoking.

## Funding

**Funding:** Research reported in this article was funded through a Patient-Centered Outcomes Research Institute (PCORI) Award (PPRN-1501-26848) to MRL. AF was partially supported by the National Institute on Drug Abuse (Grant Number K23DA039800). JOM was partially supported by the National Institute of Diabetes, Digestive, and Kidney Disorders (Grant Number K12DK111028). MRC was partially supported by a Clinical Research Training Fellowship from the American Academy of Neurology and the Tourette Association of America. EAV was partially supported by the National Institute on Drug Abuse (K01DA055073).

## Disclaimers

The statements in this article are solely the responsibility of the authors and do not necessarily represent the views of PCORI, its Board of Governors or Methodology Committee, nor of the National Institutes of Health. These funding sources solely provided financial support. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

## References

1. Pew Research Center. Social Media Fact Sheet. Pew Research Center: Washington, DC; 2021.
2. Perlis RH, Green J, Simonson M, et al. Association between social media use and self-reported symptoms of depression in US adults. *JAMA Netw Open* 2021;4(11):e2136113, doi:10.1001/jamanetworkopen.2021.36113
3. Lin XY, Lachman ME. Associations between social media use, physical activity, and emotional well-being from the Midlife in the United States Refresher daily diary study. *J Aging Phys Act* 2021;30(5):778-787, doi:10.1123/japa.2021-0267
4. Perez E, Donovan EK, Soto P, et al. Trading likes for sleepless nights: A lifespan investigation of social media and sleep. *Sleep Health* 2021;7(4):474-477, doi:10.1016/j.sleh.2021.03.004
5. Krauss MJ, Grucza RA, Bierut LJ, et al. "Get drunk. Smoke weed. Have fun.": A content analysis of tweets about marijuana and alcohol. *Am J Health Promot* 2017;31(3):200-208, doi:10.4278/ajhp.150205-QUAL-708
6. Cavazos-Rehg PA, Krauss MJ, Sowles SJ, et al. Marijuana-related posts on Instagram. *Prev Sci* 2016;17(6):710-720, doi:10.1007/s11121-016-0669-9
7. Vassey J, Metayer C, Kennedy CJ, et al. #Vape: Measuring e-cigarette influence on Instagram with deep learning and text analysis. *Front Commun* 2020;4:75, doi:10.3389/fcomm.2019.00075
8. Navarro MA, O'Brien EK, Ganz O, et al. Influencer prevalence and role on cigar brand Instagram pages. *Tob Control* 2021;30(e1):e33-e36, doi:10.1136/tobaccocontrol-2020-055994
9. Hendriks H, Wilmsen D, van Dalen W, et al. Picture me drinking: Alcohol-related posts by Instagram influencers popular among adolescents and young adults. *Front Psychol* 2020;10:2991, doi:10.3389/fpsyg.2019.02991
10. Vogel EA, Rose JP, Roberts LR, et al. Social comparison, social media, and self-esteem. *Psychol Pop Media Cult* 2014;3(4):206-222, doi:10.1037/ppm0000047
11. Sagioglou C, Greitemeyer T. Facebook's emotional consequences: Why Facebook causes a decrease in mood and why people still use it. *Comput Human Behav* 2014;35:359-363, doi:10.1016/j.chb.2014.03.003

12. Rains SA, Tsetsi E. Social support and digital inequality: Does Internet use magnify or mitigate traditional inequities in support availability? *Commun Monogr* 2017;84(1):54-74, doi:10.1080/03637751.2016.1228252
13. Naslund J, Aschbrenner K, Marsch L, et al. The future of mental health care: Peer-to-peer support and social media. *Epidemiol Psychiatr Sci* 2016;25(2):113-122, doi:10.1017/S2045796015001067
14. Lee JGL, Shook-Sa BE, Gilbert J, et al. Risk, resilience, and smoking in a national, probability sample of sexual and gender minority adults, 2017, USA. *Health Educ Behav* 2020;47(2):272-283, doi:10.1177/1090198119893374
15. Dowers E, White C, Cook K, et al. Trans, gender diverse and non-binary adult experiences of social support: A systematic quantitative literature review. *Int J Transgend Health* 2020;21(3):242-257, doi:10.1080/26895269.2020.1771805
16. Escobar-Viera C, Shensa A, Hamm M, et al. "I don't feel like the odd one": Utilizing content analysis to compare the effects of social media use on well-being among sexual minority and nonminority US young adults. *Am J Health Promot* 2020;34(3):285-293
17. Burke M, Marlow C, Lento T. Social network activity and social well-being. *SIGCHI Conference on Human Factors in Computing Systems* 2010;1909-1912, doi:10.1145/1753326.1753613
18. Verduyn P, Ybarra O, Résibois M, et al. Do social network sites enhance or undermine subjective well-being? A critical review. *Soc Issues Policy Rev* 2017;11(1):274-302, doi:10.1111/sipr.12033
19. Keum BT, Wang YW, Callaway J, et al. Benefits and harms of social media use: A latent profile analysis of emerging adults. *Curr Psychol* 2022;1-13, doi:10.1007/s12144-022-03473-5
20. Escobar-Viera CG, Whittfield DL, Wessel CB, et al. For better or for worse? A systematic review of the evidence on social media use and depression among lesbian, gay, and bisexual minorities. *JMIR Ment Health* 2018;5(3), doi:10.2196/10496
21. Andreassen CS, Torsheim T, Brunborg GS, et al. Development of a Facebook Addiction Scale. *Psychol Rep* 2012;110(2):501-517, doi:10.2466/02.09.18.PR0.110.2.501-517
22. Vogel EA, Ramo DE, Prochaska JJ, et al. Problematic social media use in sexual and gender minority young adults: Observational study. *JMIR Ment Health* 2021;8(5):e23688, doi:10.2196/23688



23. Berger MN, Taba M, Marino JL, et al. Social media use and health and well-being of lesbian, gay, bisexual, transgender, and queer youth: Systematic review. *J Med Internet Res* 2022;24(9):e38449, doi:10.2196/38449
24. Politte-Corn M, Nick EA, Dickey L, et al. #socialdistancing: Social media use and online social support moderate the effect of pandemic-related stress on internalizing symptoms in emerging adults. *J Soc Clin Psychol* 2022;41(2):30-53, doi:10.1521/jscp.2021.40.6.30
25. Cole DA, Nick EA, Zerkowicz RL, et al. Online social support for young people: Does it recapitulate in-person social support; can it help? . *Comput Human Behav* 2017;68:456-464, doi:10.1521/jscp.2021.40.6.30
26. Frison E, Eggermont S. The impact of daily stress on adolescents' depressed mood: The role of social support seeking through Facebook. *Comput Human Behav* 2015;44:315-325, doi:10.1016/j.chb.2014.11.070
27. Forest AL, Wood JV. When social networking is not working: Individuals with low self-esteem recognize but do not reap the benefits of self-disclosure on Facebook. *Psychol Sci* 2012;23(3):295-302, doi:10.1177/0956797611429709
28. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Bull* 2003;129(5):674-697, doi:10.1037/0033-2909.129.5.674
29. Brooks VR. *Minority stress and lesbian women*. Lexington Books: Lexington, MA; 1981.
30. Lunn MR, Capriotti MR, Flentje A, et al. Using mobile technology to engage sexual and gender minorities in clinical research. *PLoS One* 2019;14(5):e0216282, doi:10.1371/journal.pone.0216282
31. Lunn MR, Lubensky M, Hunt C, et al. A digital health research platform for community engagement, recruitment, and retention of sexual and gender minority adults in a national longitudinal cohort study-- The PRIDE Study. *J Am Med Inform Assoc* 2019;26(8-9):737-748, doi:10.1093/jamia/ocz082
32. The PRIDE Study. PRIDENet. 2023. Available from: [www.pridestudy.org/pridenet](http://www.pridestudy.org/pridenet) [Last Accessed; 19 April 2023].
33. Cella D, Yount S, Rothrock N, et al. The Patient-Reported Outcomes Measurement Information System (PROMIS): progress of an NIH Roadmap cooperative group during its first two years. *Med Care* 2007;45(5 Suppl 1):S3-S11, doi:10.1097/01.mlr.0000258615.42478.55

34. Kroenke K, Spitzer RL. The PHQ-9: a new depression diagnostic and severity measure. *Psychiatr Ann* 2002;32(9):509-515, doi:10.1046/j.1525-1497.2001.016009606.x
35. Bondy SJ, Victor JC, Diemert LM. Origin and use of the 100 cigarette criterion in tobacco surveys. *Tob Control* 2009;18(4):317-323, doi:10.1136/tc.2008.027276
36. Bohn MJ, Babor TF, Kranzler HR. The Alcohol Use Disorders Identification Test (AUDIT): Validation of a screening instrument for use in medical settings. *J Stud Alcohol* 1995;56(4):423-432, doi:10.15288/jsa.1995.56.423
37. Conigrave KM, Hall WD, Saunders JB. The AUDIT questionnaire: choosing a cut-off score. *Alcohol Use Disorder Identification Test. Addiction* 1995;90(10):1349-1356, doi:10.1046/j.1360-0443.1995.901013496.x
38. Hirshkowitz M, Whiton K, Albert SM, et al. National Sleep Foundation's sleep time duration recommendations: methodology and results summary. *Sleep Health* 2015;1(1):40-43, doi:10.1016/j.sleh.2014.12.010
39. U. S. Department of Health and Human Services. *Physical activity guidelines for Americans*, 2nd edition. Washington, DC; 2018.
40. Flentje A, Barger BT, Capriotti MR, et al. Screening gender minority people for harmful alcohol use. *PLOS One* 2020;15(4):e0231022, doi:10.1371/journal.pone.0231022
41. Escobar-Viera CG, Shensa A, Bowman ND, et al. Passive and active social media use and depressive symptoms among United States adults. *Cyberpsychol Behav Soc Netw* 2018;21(7):437-443, doi:10.1089/cyber.2017.0668
42. Appel M, Marker C, Gnambs T. Are social media ruining our lives? A review of meta-analytic evidence. *Rev Gen Psychol* 2020;24(1):60-74, doi:10.1177/1089268019880891
43. Lopes LS, Valentini JP, Monteiro TH, et al. Problematic social media use and its relationship with depression or anxiety: A systematic review. *Cyberpsychol Behav Soc Netw* 2022;25(11):691-702, doi:10.1089/cyber.2021.0300
44. El Abiddine FZ, Aljaberi MA, Gadelrab HF, et al. Mediated effects of insomnia in the association between problematic social media use and subjective well-being among university students during COVID-19 pandemic. *Sleep Epidemiol* 2022;2:100030, doi:10.1016/j.sleep.2022.100030

45. Paakkari L, Tynjälä J, Lahti H, et al. Problematic social media use and health among adolescents. *Int J Environ Res Public Health* 2021;18(4):1885, doi:10.3390/ijerph18041885
46. Donaldson SI, Dormanesh A, Perez C, et al. Association between exposure to tobacco content on social media and tobacco use: A systematic review and meta-analysis. *JAMA Pediatrics* 2022;176(9):878-885, doi:10.1001/jamapediatrics.2022.2223
47. Laestadius LI, Wahl MM, Cho YI. #Vapelife: An exploratory study of electronic cigarette use and promotion on Instagram. *Subst Use Misuse* 2016;51(12):1669-1673, doi:10.1080/10826084.2016.1188958
48. Ritter SL. Heating up the debate: E-cigarettes and Instagram. *Electronic Thesis and Dissertation Repository* 2015;Master of Arts(3350)
49. Chu K-H, Allem J-P, Boley Cruz T, et al. Vaping on Instagram: cloud chasing, hand checks and product placement. *Tob Control* 2017;26:575-578, doi:10.1136/tobaccocontrol-2016-053052
50. Huang J, Kornfield R, Szczypka G, et al. A cross-sectional examination of marketing of electronic cigarettes on Twitter. *Tob Control* 2014;23 Suppl 3(Suppl 3):iii26-30, doi:10.1136/tobaccocontrol-2014-051551
51. Allem J-P, Dharmapuri L, Unger JB, et al. Characterizing JUUL-related posts on Twitter. *Drug Alcohol Depend* 2018;190:1-5, doi:10.1016/j.drugalcdep.2018.05.018
52. Vogel EA, Hashemi R, Ramo DE, et al. Adolescents' perceptions of nicotine vaping-related social media content. *Psychol Pop Media Cult* 2023, doi:10.1037/ppm0000452
53. Donaldson SI, Dormanesh A, Perez C, et al. Monitoring the official YouTube channels of e-cigarette companies: A thematic analysis. *Health Educ Behav* 2023;10901981221148964, doi:10.1177/10901981221148964
54. Mayer KH, Bradford JB, Makadon HJ, et al. Sexual and gender minority health: what we know and what needs to be done. *Am J Public Health* 2008;98(6):989-995, doi:10.2105/AJPH.2007.127811
55. Drope J, Liber AC, Cahn Z, et al. Who's still smoking? Disparities in adult cigarette smoking prevalence in the United States. *CA Cancer J Clin* 2018;68(2):106-115, doi:10.3322/caac.21444
56. Pokhrel P, Ing C, Kawamoto CT, et al. Social media's influence on e-cigarette use onset and escalation among young adults: What beliefs mediate the effects? *Addict Behav* 2021;112:106617, doi:10.1016/j.addbeh.2020.106617

57. Hawes T, Zimmer-Gembeck MJ, Campbell SM. Unique associations of social media use and online appearance preoccupation with depression, anxiety, and appearance rejection sensitivity. *Body Image* 2020;33:66-76, doi:10.1016/j.bodyim.2020.02.010
58. Lee HY, Jamieson JP, Reis HT, et al. Getting fewer “likes” than others on social media elicits emotional distress among victimized adolescents. *Child Dev* 2020;91(6):2141-2159, doi:10.1111/cdev.13422
59. Ademiluyi A, Li C, Park A. Implications and preventions of cyberbullying and social exclusion in social media: Systematic review. *JMIR Form Res* 2022;6(1):e30286, doi:10.2196/30286
60. Escobar-Viera CG, Choukas-Bradley S, Sidani J, et al. Examining social media experiences and attitudes toward technology-based interventions for reducing social isolation among LGBTQ youth living in rural United States: A qualitative study. *Front Digit Health* 2022;4:900695, doi:10.3389/fdgth.2022.900695
61. Karim S, Choukas-Bradley S, Radovic A, et al. Support over social media among socially isolated sexual and gender minority youth in rural U.S. during the COVID-19 pandemic: Opportunities for intervention research. *Int J Environ Res Public Health* 2022;23:15611, doi:10.3390/ijerph192315611
62. Berger MN, Taba M, Marino JL, et al. Social media’s role in support networks among LGBTQ adolescents: a qualitative study. *Sexual Health* 2021;18(5):421-431, doi:10.1071/SH21110
63. Hall KAE, Deusdad B, D’Hers Del Pozo M, et al. How did people with functional disability experience the first COVID-19 lockdown? A thematic analysis of YouTube comments. *Int J Environ Res Public Health* 2022;19(17):10550, doi:10.3390/ijerph191710550
64. Callaghan P, Morrissey J. Social support and health: a review. *J Adv Nurs* 1993;18(2):203-210, doi:10.1046/j.1365-2648.1993.18020203.x
65. Wang HH, Wu SZ, Liu YY. Association between social support and health outcomes: a meta-analysis. *Kaohsiung J Med Sci* 2003;19(7):345-351, doi:10.1016/S1607-551X(09)70436-X.
66. Nick EA, Cole DA, Cho SJ, et al. The Online Social Support Scale: Measure development and validity. *Psychol Assess* 2018;30(9):1127-1143, doi:10.1037/pas0000558
67. Chou H-TG, Edge N. "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychol Behav Soc Netw* 2012;15(2):117-121, doi:10.1089/cyber.2011.0324

68. Crenshaw K. Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review* 1991;43(6):1241-1299, doi:10.2307/1229039
69. Auxier B, Anderson M. Social media use in 2021. Pew Research Center: Washington, DC; 2021.
70. Engeln R, Loach R, Imundo MN, et al. Compared to Facebook, Instagram causes more appearance comparison and lower body satisfaction in college women. *Body Image* 2020;34:38-45, doi:10.1016/j.bodyim.2020.04.007

**Table 1.** Characteristics of a sample of U.S. sexual and gender minority adults who use social media (N=5,995)

	% (n), M (SD), or median (IQR)
Age (median/IQR) (n=5,987)	28.7 (14.4)
<b>Race<sup>a</sup></b>	
American Indian or Alaska Native	2.6% (154)
Asian	3.3% (200)
Black or African American	2.9% (172)
Native Hawaiian or Pacific Islander	0.4% (21)
White	83.0% (4,977)
Another race	2.8% (165)
Unreported	11.3% (679)
Indicated multiple races (also included above)	5.8% (347)
<b>Ethnicity</b>	
Hispanic or Latinx	6.5% (389)
Not Hispanic or Latinx	82.4% (4,942)
Unreported	11.1% (664)
<b>Social media platform use</b>	
Facebook	96.3% (5,775)
Instagram	67.1% (4,022)
Twitter	62.4% (3,740)
LinkedIn	61.0% (3,658)
Snapchat	52.6% (3,156)
Pinterest	44.1% (2,641)
Google+	43.7% (2,620)
<b>Sexual orientation<sup>a</sup></b>	
Asexual	8.5% (910)
Bisexual	23.6% (1,415)
Gay	30.0% (1,798)
Lesbian	20.9% (1,252)
Pansexual	14.3% (857)
Queer	31.2% (1,872)
Questioning	2.9% (175)
Same-gender loving	4.4% (261)
Straight	1.9% (111)
Another sexual orientation	2.7% (162)
Unreported	10.8% (645)
Indicated multiple sexual orientations (also included above)	34.1% (2,046)
<b>Gender identity<sup>b</sup></b>	
Cisgender man <sup>c</sup>	22.1% (1,326)
Cisgender woman <sup>d</sup>	31.0% (1,861)
Gender expansive <sup>e</sup>	20.4% (1,222)
Transgender man <sup>f</sup>	6.9% (416)
Transgender woman <sup>g</sup>	3.6% (217)
Unreported	10.7% (641)
Indicated multiple gender identities (also included above)	13.4% (805)
Moderate-to-severe depression (N=5688)	31.8% (1,908)
Cigarette smoking (N=5617)	9.6% (576)
Hazardous drinking (N=5589)	14.5% (868)
Insufficient sleep (N=5748)	27.3% (1636)

Physical inactivity (N=5587)	39.9% (2395)
Active social media use (M/SD)	3.23 (1.04)
Emotional social support (M/SD) (N=5770)	16.69 (3.34)

Abbreviations: M = mean; SD = standard deviation; IQR = interquartile range

<sup>a</sup> Participants could select multiple response options. Percentages do not sum to 100%.

<sup>b</sup> Participants identifying as “man” only or as “woman” only who did not provide their sex assigned at birth (5.2%, n=312) are not included in any of the gender identity categories in this table.

<sup>c</sup> Identifies exclusively as a man and was assigned male at birth

<sup>d</sup> Identifies exclusively as a woman and was assigned female at birth

<sup>e</sup> Identifies as genderqueer and/or an unlisted gender identity

<sup>f</sup> Identifies as a man and was assigned female at birth, and/or identifies as a transgender man

<sup>g</sup> Identifies as a woman and was assigned male at birth, and/or identifies as a transgender woman

**Table 2.** *Correlations between active social media use, social support, and health indicators*

	1	2	3	4	5	6	7
1. Active social media use	1						
2. Social support	0.087 <sup>***</sup>	1					
3. Depressive symptoms	0.021	-0.287 <sup>***</sup>	1				
4. Cigarette smoking	0.029 <sup>*</sup>	-0.034 <sup>*</sup>	0.090 <sup>***</sup>	1			
5. Hazardous drinking	0.026	-0.017	0.062 <sup>***</sup>	0.186 <sup>***</sup>	1		
6. Sleep	0.046 <sup>***</sup>	-0.160 <sup>***</sup>	0.189 <sup>***</sup>	0.118 <sup>***</sup>	0.031 <sup>*</sup>	1	
7. Physical activity	0.031 <sup>*</sup>	-0.065 <sup>***</sup>	0.154 <sup>***</sup>	0.043 <sup>**</sup>	-0.040 <sup>**</sup>	0.061 <sup>***</sup>	1

\*p &lt; .05

\*\*p &lt; .01

\*\*\*p &lt; .001



**Table 3.** *Multivariable models of associations of active social media use and emotional social support with health indicators.*

	<i>Main effect of active social media use</i>		<i>Main effect of social support</i>		<i>Active social media use X social support</i>	
	AOR [95% CI]	<i>p</i>	AOR [95% CI]	<i>p</i>	AOR [95% CI]	<i>p</i>
Moderate-to-severe depressive symptoms (N=4637)	1.18 (1.10, 1.26)	<.001	.51 (.48, .55)	<.001	1.00 (.94, 1.07)	.962
Cigarette smoking (N=4612)	1.11 (1.01, 1.22)	.036	.94 (.86, 1.03)	.193	1.03 (.94, 1.12)	.559
Hazardous drinking (N=4591)	1.07 (.99, 1.16)	.107	.94 (.87, 1.02)	.153	1.06 (.98, 1.14)	.160
Insufficient sleep (N=4682)	1.13 (1.06, 1.21)	<.001	.71 (.67, .76)	<.001	1.02 (.96, 1.09)	.499
Physical inactivity (N=4556)	1.09 (1.02, 1.15)	.008	.90 (.85, .96)	.001	.97 (.91, 1.02)	.235

Abbreviations: AOR = adjusted odds ratio; CI = confidence interval

Note: Age, race(s), ethnicity, sexual orientation(s), and gender were entered in Step 1 of each model. Main and interactive effects of active social media use and social support were entered in Step 2. Each model included both main and interactive effects of active social media use and social support.