

Social Isolation, Social Media Use, and the Adolescent Mental Health Crisis: Exploring the Interaction of Risk Factors on Depression

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Background

Adolescence is a critical developmental period. Unfortunately, the US Surgeon General, Vivek Murthy, has declared teen mental health as a state of emergency. During this time, social connections and peer interactions play a crucial role in adolescent well-being.

Methods

In order to investigate potential risk factors for adolescent mental health outcomes such as depression, we ran hierarchical multiple regression models to explore the potential significant associations between both social media use and social isolation on depression symptoms. This was a cross-sectional study employing a large sample of teens from urban and rural schools across Southern Idaho ($n=8,407$ mean age=14.6). We then ran an interaction model to determine a potential interaction effect between social isolation and social media use on depression.

Results

We found that both social media use and social isolation were significantly associated with depression outcomes. Social isolation had a larger effect, accounting for a difference of 4.84 in depression scores for every one unit change in social isolation ($p<0.001$). The interaction effect was significant.

Discussion

Although it is common for adults to point to social media use as a main risk factor for teen depression, experiencing social isolation poses greater risk. Additionally, findings suggest that the impact of social media use on depression depends on an adolescent's level of social isolation.

Conclusion

Professionals who want to ameliorate the teen mental health crisis may need to focus attention on increasing social connection for adolescents they serve.

Introduction: Adolescence is a critical developmental period marked by significant social, emotional, and physical changes.¹ Alarming, adolescents in the US are reporting higher rates of mental health concerns (e.g. depression, anxiety, and suicidal ideation) than ever before.² During adolescence, social connections and peer interactions play a crucial role in shaping identity, self-esteem, and overall well-being.¹ Social isolation, or the lack of subjective quality and quantity of social connections,³ has been identified as a significant risk factor for poor mental health outcomes.⁴ Concurrent with the increase in poor mental health outcomes, social media usage has also increased for adolescents, with one-third of American teens reporting using at

least one of the five most popular social media platforms almost constantly.⁵ Taken together, concerns about the potential associations between social isolation, social media use, and adolescent mental health have arisen.

To meet these concerns, studies have explored the relationship between screen time and various health outcomes, including sleep disturbances, obesity, and mental health challenges, especially depression.⁶ Some studies suggest that excessive social media use can contribute to feelings of inadequacy, social comparison, and fear of missing out (FOMO), all of which can increase the risk of depression.⁷ However, results have been mixed. Several meta-analyses outlined the inconsistent findings regarding adolescent so-

cial media use and mental health outcomes.^{9,10} Research in a sample of Flemish youth (ages 14-25) found that more intense social media usage did correlate with negative emotion and decreases in satisfaction with mental health, especially among boys. However, when social media was used for social interaction, usage was positively correlated with well-being.¹¹ Of note, for marginalized youth, such as LGBTQ+ identified youth, studies show that finding affiliative communities and accurate information in a safe space on social media can be protective.¹² Further, social media use varies widely across subgroups with girls and those in high SES using it significantly more than their peers.¹³

Research has also investigated the impacts of social isolation, sometimes referred to as loneliness, on health outcomes. The US Surgeon has declared a loneliness epidemic in the US, with young adults reporting the highest rates of social isolation and loneliness. Impacts of social isolation on individual health significantly increases risk of all causes of death.⁴ Of note, a review of 63 studies concluded that loneliness and social isolation among children and adolescents increases the risk for both depression and anxiety.¹⁴

Due to the relatively recent increase in both loneliness and social media use in teens, studies investigating the association between these constructs on adolescent mental health and well-being seem prudent. However, the effects of social isolation in combination with social media use on youth mental health are not well understood. One study of 1,787 young adults in the United States found that those who spent more than the average of 30 minutes per day on social media faced greater risk of perceived social isolation. Individuals in the highest usage category—121 minutes or more per day—had twice the odds of experiencing increased social isolation compared to those with the lowest usage.¹⁴ Similarly, a nationally representative cross-sectional study that repeatedly surveyed 8th-12th graders in the United States from 1990 to 2017 found that youth with high social media usage and low in-person social interactions, reported the highest levels of loneliness. Notably, at the individual level, higher rates of social media usage were correlated with *more* in-person socialization, but the cohort level showed a clear converse relationship between increasing social media use and decreasing in-person interactions.¹⁵

Thus, research has provided some indication that a) social media use may be associated with mental health, b) social isolation is associated with mental health, and c) that there may be a relationship between social media use and depression. However, this is still an emerging field of study and many questions remain. Our study aims to add to the literature by investigating the potential interaction between social media use and social isolation as they relate to depression in an adolescent population.

RESEARCH AIMS

To establish whether social isolation is significantly associated with depression in adolescents.

To establish whether social media use is significantly associated with depression in adolescents.

To investigate the interaction effect between social media use and social isolation on adolescent depression.

METHODS

PROCEDURES

This study was part of a larger, ongoing project focused on building community capacity for upstream prevention efforts for youth mental health. Each year, regional areas (cities or counties) in Idaho participating in this project administer a survey to youth in grades 6-12 in that region. The survey is composed by our research team and includes various validated measures for a wide range of youth well-being and mental health factors. The survey takes about 45 minutes to complete, and it is administered during school hours via Qualtrics. The survey is only administered to youth who have parental consent. Youth have the option to assent. Survey responses are anonymous. This analysis comes from survey responses from youth attending urban and rural public and charter schools across Southern Idaho during the 2022-2023 academic year. All study procedures were approved by the academic Institutional Review Board.

PARTICIPANTS

Of the 10,098 students eligible to take the survey, 8,407 students (83% response rate) participated. The sample was 37% 6-8th graders and 63% 9-12th graders. Students were, on average, 14.6 years old, and 75% identified as white non-Hispanic and 51% identified as male.

DEPRESSION MEASUREMENT

Depression was measured using the Patient Health Questionnaire for Mental Disorders (PHQ-9), a 9-item clinical measurement tool used to assess depression symptomatology.¹⁶ The stem asked “In the last two weeks how often have you been bothered by the following problems?” and items included “little interest or pleasure in doing things.” Response options ranged from 0 (not at all) to 4 (nearly every day). Items were summed to create a depression score that ranged from 0 to 27, with higher scores representing more depression symptoms.

SOCIAL ISOLATION MEASUREMENT

Social isolation was measured using a validated 6-item Social Isolation/Loneliness scale (Cronbach’s α : 0.78).³ Students were asked to select the response that most closely represents their experience, and items included “I experience a general sense of emptiness” and “There are enough people I feel close to.” Response options range from 1 (none of the time) to 5 (a lot of the time). Items were reverse coded as needed and combined into a mean social isolation score ranging from 0 to 5, with higher scores representing more social isolation. A median split was also employed to create two groups: “Low Social Isolation” and “High Social Isolation.”

SOCIAL MEDIA USE MEASUREMENT

Social media use was measured using the question “Outside of school, about how much time do you spend each day in front of a screen on social media (Twitter, TikTok, Facebook, etc.)?” Response options included 1 (I do not spend time on this); 2 (less than 30 minutes per day); 3 (about 31-60 minutes per day); 4 (about 1-2 hours per day); 5 (about 2-4 hours per day); and 6 (more than 4 hours per day). As there is currently no agreed upon meaningful cut point for social media use, we chose the most conservative estimates to create two groups. Thus responses 1 to 5 were categorized as “None to Low Social Media Use” and 6 as “High Social Media Use.”

DATA ANALYSIS

All data analysis was completed in SPSS (Version 30). We ran separate multiple linear regression analyses, controlling for age and gender, that assessed the association between depression scores and social isolation, and the association between depression scores and social media use. In order to investigate a potential interaction effect of social media and social isolation on depression, we employed an ANOVA. All relevant assumptions of the analyses were met.

RESULTS

Descriptive statistics were run to determine potential differences across subgroups and the three main variables of interest; depression, social media use, and social isolation. Older participants reported higher rates of moderate to severe levels of depression (42% high school compared to 29% middle school), higher rates of high social isolation (17% high school compared to 11% middle school), and higher social media use (18% high school compared to 16% middle school). Girls reported higher rates of moderate to severe levels of depression (46% compared to 29% boys), higher rates of high social isolation (17% compared to 10% of boys), and higher social media use (21% compared to 14% boys). Non-white students reported higher rates of moderate to severe levels of depression (38% compared to 36% white students), higher rates of high social isolation (16% compared to 14% white), and higher social media use (20% compared to 14% of white students).

As shown in [Table 1](#), our first multiple regression analysis revealed that social isolation is significantly associated with depression ($F(3,6531) = 1925.19$, $p < 0.001$, $R^2 = 0.47$). Controlling for age and gender, depression scores increased an average of 4.84 points for every one unit increase in social isolation scores ($B = 4.84$, $p < 0.001$).

As shown in [Table 2](#), our second multiple regression analysis revealed that social media time was also significantly associated with depression ($F(3,6781) = 393.48$, $p < 0.001$, $R^2 = 0.15$). Controlling for age and gender, depression scores increased an average of 1.04 points for every one unit increase in social media use ($B = 1.04$, $p < 0.001$).

Next, a moderation analysis was conducted using ANOVA. The overall model was significant ($F = 550.53$,

$p < 0.001$, $\eta^2 = 0.26$). As shown in [Table 3](#), results of the analysis indicated significant main effects for both social isolation ($F = 1187.49$, $p < 0.001$, $\eta^2 = 0.15$) and social media use ($F = 197.86$, $p < 0.001$, $\eta^2 = 0.03$). The interaction effect was significant ($F = 16.81$, $p < 0.001$, $\eta^2 = 0.02$). For adolescents reporting high social media use, those also reporting low social isolation had a mean depression score of 10.62 and those reporting high social isolation had a mean depression score of 17.56; thus, the effect of social media use on depression depends on the level of social isolation.

DISCUSSION

The first two aims of the present study were to establish the relationships between social isolation and social media use on depression. Although both social isolation and social media use were significantly associated with depression, social isolation had a much greater impact on adolescent depression scores than social media use. This is an important finding given the current climate, as many adolescent mental health interventions are taking a sole focus on social media use abstinence (e.g. “Wait Until 8th” a parent social norms campaign that encourages parents to keep kids off phones/screens/social media until 8th grade).¹⁷

As our study also found a significant relationship between social media use and adolescent depressive symptoms, mental health promotion programs that are upstream of crisis/focused on primary prevention may thus benefit from efforts to reduce adolescent social media use and or reduce problematic behaviors on digital media more generally. It is worth noting however that efforts to reduce adolescent social media and larger mobile phone use need to be nuanced and evidence-informed in their approach. This can be achieved by matching prevention strategies to the developmental stage of adolescents, as well as recognizing that social media/phone use has risks as well as benefits for many young people.^{9,10} Additionally, as with many public health matters, recognizing that abstinence is not the only path forward may be prudent. For example, the current evidence around strategies like banning mobile phone use in schools (phones are the most common way of accessing social media applications/platforms) show inconclusive results on academic outcomes, mental health, and cyberbullying.¹⁸ Prior studies have also shown that restrictive parental mediation of adolescent digital media use (e.g., actions like taking away a teen’s phone or limiting their screen time to a certain number of minutes/hours) can be damaging to parent-child communication patterns and relationship quality,¹⁹ which can also relate to mental health challenges in youth.²⁰ Programming/interventions that focus on teaching knowledge and skills for safe, prosocial, and measured digital media and technology, as well as that bolster protective factors, such as social connection to families, schools, and peers may be worthwhile strategies to pursue.²¹ While social media does appear to contribute to adolescent mental health it appears social isolation has a greater impact and thus should not be ignored.

Further, our findings suggest the impact of high social media use on depression depends on the level of social iso-

Table 1. Association between social isolation and depression, adjusted for age and gender.

Variable	<i>B</i>	<i>SE B</i>	β
Age	0.24	0.04	0.06*
Gender	-2.24	0.12	-0.17*
Social isolation	4.84	0.07	0.63*

* $p < 0.001$ **Table 2. Association between social media use and depression, adjusted for age and gender.**

Variable	<i>B</i>	<i>SE B</i>	β
Age	0.41	0.04	0.11*
Gender	-2.88	0.15	-0.22*
Social media use	1.04	0.05	0.25*

* $p < 0.001$ **Table 3. ANOVA analysis on the effects of social isolation, social media use, and their interaction on depression.**

Variable	<i>F</i>	η^2
Social isolation	1187.49*	0.15
Social media use	197.86*	0.03
Social isolation*social media use	16.81*	0.02

* $p < 0.001$

lation, which presents a compelling argument for initiatives aimed at decreasing social isolation as a means to prevent adolescent depression. More specifically this study points to the importance of addressing social isolation through programming and services (e.g., schools, out-of-school time programs, youth centers) for youth. While a variety of programs and interventions exist to promote youth well-being, a recent meta-analysis found that there was a dearth of programming specifically focused on preventing or addressing social isolation among adolescents.²² Thus professionals who work with youth may need training or other supports that facilitate staff understanding and skills for preventing social isolation and building adaptive and prosocial social connection. In the same vein, new programs/services may need to be developed and implemented with the specific purpose of preventing adolescent social isolation and loneliness. A variety of existing research can be used in program development. For example, a meta-analytic review of the predictors of adolescent loneliness found that gender, depression, shyness, and self-esteem, social support, social anxiety, maternal expressiveness, and paternal expressiveness had large-to-medium effect sizes on adolescent loneliness.²³ Future studies should evaluate the effectiveness of such strategies as well as further investigate the potential differences across subpopulations of teens.

LIMITATIONS AND STRENGTHS

The present study involved several limitations. First, because this study involves the analysis of cross-sectional student survey data no causal relationships can be established. Additionally, students were asked potential sensitive topics, which introduces the risk some students may have provided responses in a way that they would be viewed favorably (e.g., social desirability bias). Further, given this survey data was used for a larger project, the variable for social media use in this study involved a relatively simplistic measurement of the number of hours spent on social media per day. Functionally, this means our study lacked indicators of problematic/maladaptive social media use behaviors versus pro-social, adaptive, and/or socially connecting social media use. Finally, our sample included 75% participants who identified as white (non-Hispanic) which is similar to the state population, but may limit generalizability to more diverse populations.

Given the limitations, there are still many strengths. This study explores a novel association between important risk factors relevant to the adolescent mental health crisis. It also employs a large sample. Moreover, findings support health equity and social justice in several ways. First, the study's focus on adolescent mental health is crucial for developing targeted interventions to reduce the disproportionate burden of depression on this population. Adolescents do not vote, enact policy, or have very much control over their environment, which makes it incumbent upon researchers and advocates to continue to reduce mental

health disparities in this population. Further, by highlighting the disproportionately large impact of social isolation on adolescent depression, this research implicitly addresses health equity as marginalized groups often experience increased isolation due to factors like discrimination, limited resources, and systemic barriers. Finally, findings suggest that while social media use is a factor in adolescent depression, it is overshadowed by the contribution of social isolation, thus encouraging society to look beyond simplistic, individual-level solutions and address the broader social and structural factors that contribute to isolation, which is a crucial step in achieving equity.

Conclusion: Taken together, the current findings demonstrate a significant association between both social isolation and social media use with adolescent depression, with social isolation exhibiting a substantially stronger influence. Notably, the extent to which social media use impacts depression is dependent on the level of social isolation a teen may be experiencing. These findings underscore the critical need to prioritize interventions addressing social isolation in youth and highlight the importance of comprehensive, multi-faceted approaches to mental health promotion that extend beyond individual-level factors and consider broader social determinants of health.

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DISCLOSURE STATEMENT

The author(s) have no relevant financial disclosures or conflicts of interest.

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