Virtual Bonds; Real Emotions: Systematic Review Exploring Online Social Connections and Adolescent Mental Health

Tyler Prochnow, PhD,[1] Rithanya Senthil,[2] Allison Poulos, PhD,[3] Meg S. Patterson, PhD,[1] Jamilia Blake, PhD,[1] and Philip Massey, PhD[4]

Abstract

Adolescent mental health issues have been increasing globally, with one in seven youth experiencing mental health disorders. While social connectedness traditionally serves as a protective factor, the widespread adoption of online platforms has fundamentally transformed how adolescents build and maintain social relationships. This systematic review aimed to synthesize existing literature on the relationship between online social connections and mental health among adolescents aged 10–18 years. The review specifically examined how the structure, function, and quality of online interactions influence mental health outcomes, guided by the U.S. Surgeon General's framework on social connection. A systematic search was conducted in January 2024 using PsycINFO, MEDLINE, PubMed, and Web of Science databases. Studies were included if they measured mental health outcomes, assessed online social connection, analyzed relationships between these variables, and focused on adolescents ages 10–18 years. From an initial search of 3,745 articles, 23 met inclusion criteria after screening. The review revealed complex, bidirectional relationships between online social connections and adolescent mental health. Online-only friendships demonstrated a protective function, particularly for vulnerable youth experiencing suicidal ideation. Social capital in online contexts significantly influenced well-being, with higher online social capital associated with positive outcomes, especially in gaming environments. Gender differences emerged in social media effects, with passive use negatively impacting girls. Online social connections present both opportunities and risks for adolescent mental health. While digital platforms can provide valuable support and self-expression opportunities, particularly for vulnerable youth, they also carry risks related to social comparison and inadequate support.

Keywords: adolescents, mental health, online social connections, social media

Introduction

The emotional and mental well-being of adolescents influences their self-esteem, behavior, academic performance, social cohesion, and overall development into adulthood, shaping their future health and life opportunities.[1,2] However, mental health issues among adolescents have become an increasingly concerning matter. Globally, 1 in 7 (13 percent) of youth aged 10–19 experience mental health disorders.[3] In the United States, there has been a reported 40 percent rise in persistent feelings of sadness or hopelessness and a 36 percent rise in serious considerations of attempting suicide among high school students between 2009 and 2019.[4] These indicators of poor mental health and others such as depression, anxiety, stress, self-harm, and suicidal ideation can have long-lasting impacts on the adolescent health and health-related quality of life.[5] Poor mental health status is associated with physical health concerns, including compromised sleep patterns, poor diet, and increased vulnerability to chronic conditions,[6] and developmental concerns such as low academic performance, substance use, social isolation, and violent tendencies.[7]

Within the field of public health, it has been established that social connectedness protects and improves mental health.[8] Specifically, a higher level of connectedness in individuals' social circles, irrespective of age, serves a dual purpose in both protecting against maladaptive coping mechanisms and promoting improved mental health outcomes.[9] Peer and family support are central avenues of social connectedness that contribute to building resilience and emotional and social well-being.[10] Peer support systems involve mutual understanding, empowerment, and exchange of practical and emotional support, offering vital emotional validation.[11] Familial support systems can take the form of financial or moral support through guidance and stability, reinforcing positive emotional developmental pathways with positive family relationships.[10]

[1]Department of Health Behavior, Texas A&M University, School of Public Health, College Station, Texas, USA.
[2]Obra D. Tompkins High School, Katy, Texas, USA.
[3]College of Health Solutions, Arizona State University, Phoenix, Arizona, USA.
[4]Department of Community Health Sciences, UCLA Fielding School of Public Health, Los Angeles, California, USA.

Peer and familial relationships are among the many interconnected networks of relationships that provide support and social capital. Social capital typically refers to various social resources that might be present within networks and may include information, feelings of trust and belonging, and can act as a buffer against stress and adversity through access to supportive resources.[12]

The online environment has become a significant context for social interactions, consequently influencing mental health. With near ubiquitous access to the Internet and social networking sites (SNS), many social interaction patterns now occur online.[13] However, studies indicate that there are complex and sometimes inconsistent associations between the use of online sites and social media platforms and risks of depression, anxiety, lowered self-esteem, and cyberbullying.[14,15] While some of the degrading impacts on individuals' mental health may be attributed to a lack of quality social connection, social isolation or avoidance behavior, and deindividuation upon prolonged online and social media usage,[13,16–18] the diversity of online platforms and variety of ways adolescents connect virtually make these associations difficult to identify at times. Recently, research has identified an important distinction between active and passive SNS usage, which may mediate the impact of online interactions and mental health among adolescents.[19] While passive social networking entails online interaction with no distinct objective and leads to experiences of isolation and social comparison, active social network users utilize online platforms as a mechanism to advance social relationships, strengthening their self-esteem and promoting positive mental health results.[20]

Existing systematic studies have been conducted on the general effects of Internet or social media usage on adolescents' mental health.[21,22] However, there is a limited understanding of the relationship between adolescent mental health and online social connection, specifically measured by the structure, function, and quality of their social networks in the online space. This article reviews existing literature on online social connection and mental health to establish a better understanding of how both topics have been investigated in adolescents. The U.S. Surgeon General's advisory on the Healing Effects of Social Connection and Community provides a valuable framework for this review.[23] The advisory emphasizes that humans are wired for social connection, but have become more isolated over time. In this context, online social connections can be seen as a potential remedy for this isolation, offering new avenues for maintaining and building social relationships. The three categories of social connection outlined in the advisory—structure, function, and quality—are all relevant to online interactions and will be the basis for this review. The Surgeon General's advisory[23] defines *structure* as "the number of relationships, variety of relationships (e.g., co-worker, friend, family, neighbor), and the frequency of interactions with others." The structure of online connections is evident in the variety of platforms and types of interactions available, including the number of friends, frequency of interactions, and variety of interactions (e.g., liking a post, sending a direct message). The Surgeon General's advisory[23] defines *function* as "the degree to which others can be relied upon for various needs." Function in this context could be reflected in how adolescents rely on online connections for support, information, or other needs. Finally, the Surgeon

General's advisory[23] defines *quality* as "The degree to which relationships and interactions with others are positive, helpful, or satisfying (vs. negative, unhelpful, or unsatisfying)." Online social connection quality would then relate to how relationships or interactions with others online are positive, helpful, or satisfying. Therefore, this study is important because it provides information on how research has examined the reciprocal relationship between online social connections and adolescents' mental health simultaneously and detailed how certain factors of these connections are associated with their mental health.

Methods

Literature search

A comprehensive search of the literature was performed in January 2024 using PsycINFO, MEDLINE, PubMed, and Web of Science databases. Search terms and Boolean operators used for this search were as follows: ("adolescen*" OR "kid*" OR "youth*" OR "child*" OR "teen*") AND ("mental health" OR "depress*" OR "anxiety" OR "emotion*" OR "psychological distress") AND ("social network analysis" OR "social network*" OR "social support" OR "friend*" OR "peer*" OR "social influence" OR "social environment" OR "social interaction*" OR "social connect*" OR "social isolat*" OR "loneliness") AND ("social media*" OR "social network site*" OR "online" OR "Facebook" OR "twitter" OR "tiktok" OR "Instagram" OR "youtube"). All records were imported to Covidence to manage the review process.[24] This review was not registered prior to the search.

Inclusion criteria

To be included in the final sample, articles needed to: (a) include a measure of mental health (e.g., depressive symptoms, anxiety, stress, mental well-being, suicidality, positive and negative affect), (b) include a measure of social connection through online means defined as an indication of the structure (e.g., number of online friends/followers, frequency of online communication, social network analysis metrics), function (e.g., online social support seeking/provision, help-seeking behaviors, relationship maintenance, personal sharing), and/or quality (e.g., perceived online social support quality, relationship closeness, positive/negative feedback, self-disclosure quality, social comparison) of social connection specifically through online platforms, including both validated self-report measures and observational/behavioral data such as actual social media metrics, (c) conduct an analysis between mental health and measures of online social connections, and (d) be focused on adolescents ages 10–18. Articles also had to be published in a peer-reviewed journal and be available in English.

Screening for inclusion

The initial search resulted in 3,745 articles. Duplicates (n = 1,323) were removed before abstract review, leaving 2,422 for title and abstract screening. Title and abstracts were then reviewed against the inclusion criteria, and 2,219 articles were removed for irrelevancy. The remaining articles (n = 203) were assessed by two authors independently. The reviewers displayed 85 percent agreement on full text review.

One hundred and eighty articles were excluded during full-text assessment because they did not use a measure of online social connectedness ($n = 80$), only measured presence of cybervictimization ($n = 32$), did not include a measure of mental health ($n = 27$), did not conduct an analysis between study variables ($n = 10$), or were outside of the selected age range ($n = 8$). Studies that only measured the presence of cybervictimization and not another form of social connection through online means were excluded due to the special nature of this type of negative connection and were not comparable to the other observed social connections that could be positive and/or negative. In addition, articles were removed if they were commentaries or editorials ($n = 3$), reported only qualitative results ($n = 14$), or only reported a study protocol, design, or feasibility ($n = 6$). The final sample contained 23 articles, which were then moved to data extraction. Full PRISMA data and diagram can be found in Figure 1.

Data extraction

The following data were extracted from each of the final 23 studies: (a) study purpose, (b) study design (i.e., cross-sectional, longitudinal, experimental), (c) sample characteristics, (d) mental health measure used, (e) online social connectedness measure used, and (f) key findings. Each article was extracted by one of the authors and data checked by another author.
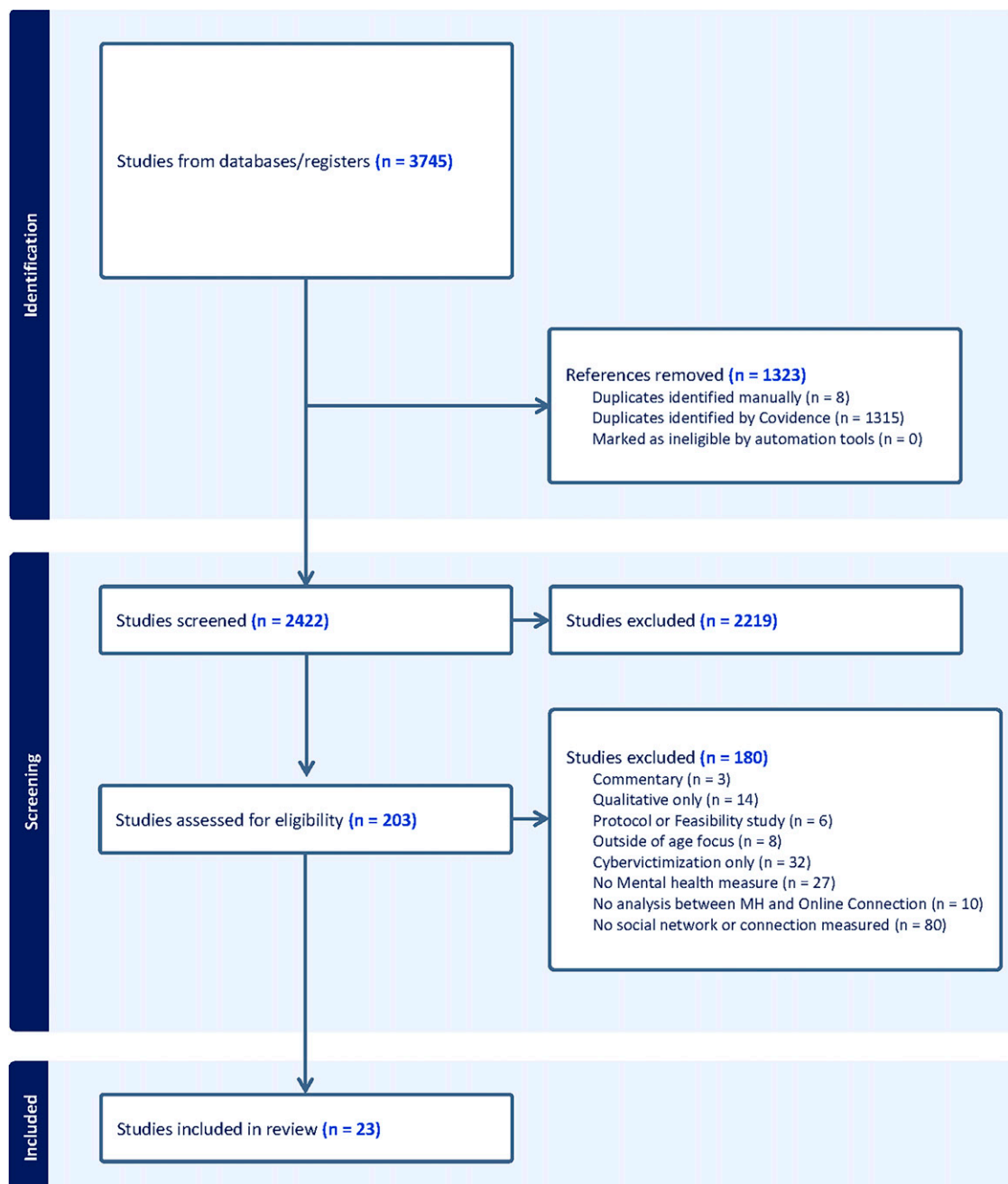

FIG. 1. PRISMA Diagram.

Quality and bias assessment

Since the final sample of articles contained both observational and intervention studies, a modified quality and bias assessment tool was required to assess all articles with the same tool. Other tools that specifically measure the quality of random control trials could not be used as it would unintentionally bias against observational approaches in the studies included. As recommended by a review of quality and bias assessment tools,[25] a modified scale from Downs and Black was used with 16 items.[26] This measure was modified to remove items that involved evaluating interventions as the studies in this sample mainly consisted of observational studies. Table 1 provides a summary of bias assessment results.

Results

Sample description

Studies in this sample were conducted across various countries, with the most common being the United States ($n = 6$, 26.1 percent) and Belgium ($n = 5$, 21.7 percent), followed by China ($n = 3$, 13.0 percent). The remaining studies were conducted in the Netherlands ($n = 1$, 4.3 percent), Taiwan ($n = 1$, 4.3 percent), Northern Ireland ($n = 1$, 4.3 percent), Czech Republic ($n = 1$, 4.3 percent), Australia ($n = 1$, 4.3 percent), Indonesia ($n = 1$, 4.3 percent), Italy ($n = 1$, 4.3 percent), South Korea ($n = 1$, 4.3 percent), and Norway ($n = 1$, 4.3 percent). Study designs were primarily cross-sectional ($n = 15$, 65.2 percent), with the remaining being longitudinal ($n = 8$, 34.8 percent). Sample sizes ranged from 110 to 9,733 participants, with a median of approximately 910 participants. The age of participants typically fell between 11 and 18 years old, with mean ages ranging from 11.79 to 17.86 years in the studies that reported specific mean ages ($n = 19$, 82.6 percent), whereas the remaining studies ($n = 4$, 17.4 percent) described age ranges or school grades. Gender distribution was reported in all studies, with most including both males and females ($n = 20$, 87.0 percent), whereas some focused solely on males ($n = 2$, 8.7 percent) or females ($n = 1$, 4.3 percent).

Measures of online social connection varied widely, with online social support being the most common ($n = 7$, 30.4 percent). Other measures included online social capital ($n = 3$, 13.0 percent), online communication frequency or quality ($n = 3$, 13.0 percent), social media use patterns ($n = 2$, 8.7 percent), online friendship quality ($n = 2$, 8.7 percent), online help-seeking ($n = 2$, 8.7 percent), and specific measures such as upward social comparison on SNS, intimate disclosure with online-only friends, and positive self-disclosure online ($n = 4$, 17.4 percent).

Mental health measures predominantly focused on depressive symptoms ($n = 17$, 73.9 percent), often using the Center for Epidemiological Studies Depression Scale ($n = 9$, 39.1 percent). Anxiety was measured in 6 studies (26.1 percent), with 4 studies specifically assessing social anxiety. General mental well-being was assessed in 3 studies (13.0 percent), using measures such as the Warwick-Edinburgh Mental Well-Being Scale. In addition, 3 studies (13.0 percent) measured both positive and negative affect, and 1 study (4.3 percent) focused on suicidality. More information on the studies included in this sample can be found in Table 2.

Surgeon general's social connection categories

Structure, function, and quality were the three categories of social connection highlighted by the Surgeon General. The following sections report results of this review in the context of those three categories, highlighting specific findings from the 23 studies included. The main findings from each section can be found in graphical display in Figure 2.

Structure.   The structure of online social connections, encompassing the quantity and variety of relationships, was found to have a complex, bidirectional relationship with adolescent mental health.[40] It was reported that online-only friendships were common among youth (38.3 percent), particularly for those experiencing suicidal ideation (46.3 percent). Importantly, these online connections served a protective function, as having one or more online-only friends diminished the

TABLE 1. QUALITY AND BIAS ASSESSMENT

Criterion	n	%
Are the objectives or hypotheses of the research described in the article stated?	23	100%
Is the study design presented?	22	96%
Do the authors describe the target population they wanted to research?	20	88%
Was a random sample of the target population taken? AND was the response rate 60% or more?	9	42%
Is participant selection described?	16	71%
Is participant recruitment described, or referred to?	15	67%
Are the inclusion and/or exclusion criteria stated?	8	38%
Is the study sample described? (minimum description=sample size, gender, age, and an indicator of SES)	17	75%
Are the numbers of participants at each stage of the study reported? (Authors should report at least numbers eligible, numbers recruited, numbers with data at baseline, and numbers lost to follow-up)	21	92%
Are measures of mental health described?	23	100%
Are measures of online connectedness described?	23	100%
Do authors describe the source of their data (e.g., cancer registry, health survey) AND did authors describe how the data were collected? (e.g., by mail)	22	96%
Was reliability of the measures mentioned or referred to?	18	79%
Was the validity of the measures mentioned or referred to?	14	63%
Were appropriate statistical methods used and described, including those for addressing confounders?	20	88%
Were the numbers/percentages of participants with missing data indicated AND If more than 20% of data in the primary analyses were missing, were methods used to address missing data?	10	46%

TABLE 2. STUDY CHARACTERISTICS FROM ARTICLES INCLUDED IN SAMPLE

Study ID	Country	Study design	n	Age in years	Gender	Measure of online social connection	Measure of mental health	Main findings
Achterhof 2022[27]	Belgium	Longitudinal	1,705	$M = 13.7$; $SD = 1.8$	38.7% male, 63.3% female	Online Social Quality	Positive and negative affect	Adolescents experienced more positive emotions when interacting online compared with being alone, but face-to-face interactions were associated with the most positive and least negative emotions. The hypothesis that those with more social support would benefit more from online interactions was not supported.
Anasuyari 2023[28]	Indonesia	Cross-sectional study	292	NA "students aged 12–18"	26.4% male, 73.6% female	Online Friendship Scale	Mental well-being—Mental Health Continuum-Short Form	Online friendships were negatively associated with loneliness and indirectly linked to better mental health through reduced loneliness.
Best 2016[29]	Northern Ireland	Cross-sectional study	527	NA "adolescent males aged 14–15 attending secondary education"	100% male	Online Help Seeking	Mental well-being—Warwick-Edinburgh Mental Well-Being Scale	Young males who discussed personal issues with online friends reported significantly higher levels of mental well-being.
Bonetti 2010[29]	Australia	Cross-sectional study	626	$M = 12.85$; $SD = 1.92$	50.5% male, 49.5% female	Online communication frequency, topics, motivations, and partner composition	Social anxiety—Social Anxiety Scale for Adolescents	Lonely children and adolescents used online communication more frequently for personal topics and to compensate for weaker social skills.
Boursier 2023[30]	Italy	Cross-sectional study	544	$M = 16.22$; $SD = $ NA	28.1% male, 71.9% female	Online relational closeness	Depression Anxiety Stress—Depression Anxiety Stress Scale	Close relationships with online friends moderated the effects of loneliness on adolescents' stress and depression.
Charmaraman 2022[31]	United States	Longitudinal	586	$M = 12.25$; $SD = 1.46$	48% male, 51% female	Positive Social Media Use; Facebook Relationship Maintenance Behavior Scale; Online Social Support Seeking	Depressive Symptoms—Center for Epidemiological Studies Depression Scale	Minimal effects of social technology use on adolescent well-being were found during COVID-19 social distancing, contradicting popular assumptions about the strong link between technology use and well-being.
Chen, K.-C. 2022[32]	Taiwan	Cross-sectional study	1,127	NA "junior high school students"	49.8% male, 49.0% female	Online social support	Depression Anxiety Stress—Depression Anxiety Stress Scale	Online social support moderated the relationship between depression and Internet addiction. Specifically, higher levels of online social support attenuated the indirect effects of depression on Internet addiction through refusal self-efficacy of Internet use, suggesting that online social support served a protective function against problematic Internet use among depressed adolescents.
Chen, Q. 2022[33]	China	Cross-sectional study	1,213	$M = 14.49$; $SD = 1.05$	55.5% male, 44.5% female	Online Social Capital	Depressive Symptoms—Center for Epidemiological Studies Depression Scale	Offline social capital mediated the relationship between victimization by teachers/peers and depression, whereas online social capital mediated the relationship between cybervictimization and depression.

(continued)

TABLE 2. (CONTINUED)

Study ID	Country	Study design	n	Age in years	Gender	Measure of online social connection	Measure of mental health	Main findings
Chen, S. 2022[34]	China	Cross-sectional study	1,658	$M = 16.0$; $SD = 1.2$	49.6% male, 50.4% female	Online Help Seeking	Suicidality	Adolescents preferred seeking help from offline peers and friends but less positive about seeking assistance from online friends or professionals with whom they had not yet developed a real-world connection. Willingness to seek online help was associated with increased suicidality risk, whereas seeking help from peers and friends was linked to decreased risk.
Colder Carras 2017[35]	Netherlands	Cross-sectional study	9,733	$M = 14.1$; $SD = $ NA	48.8% male, 51.2% female	Network of Relationships Inventory	Depressive symptoms—Depressive Mood List; Social Anxiety—Social Anxiety Scale	Different types of heavy gaming behaviors were identified based on online social interaction. Those with more social interaction reported fewer problematic gaming symptoms. Depression was more common in heavy gamers. Female social gamers had less social anxiety and loneliness, but lower self-esteem. Friendship quality attenuated depression in some male social gamers, but strengthened associations with loneliness in some male nonsocial gamers.
Frison 2015[36]	Belgium	Cross-sectional study	910	$M = 15.44$; $SD = 1.71$	48.1% male, 51.9% female	Perceived social support through Facebook	Depressive Symptoms—Center for Epidemiological Studies Depression Scale	Daily stress increased adolescents' likelihood of seeking support on Facebook. When this support was perceived, it reduced depressed mood, but when support was sought but not perceived, it increased depressed mood.
Frison 2016[37]	Belgium	Cross-sectional study	910	$M = 15.44$; $SD = 1.71$	48.1% male, 51.9% female	Active and Passive Facebook use; Perceived online social support	Depressive Symptoms—Center for Epidemiological Studies Depression Scale	The impact of Facebook use varied by gender and usage type. Passive use in girls and active public use in boys had negative effects. However, girls who actively used Facebook and perceived social support showed benefits, with lower depressed mood.
Frison 2019[38]	Belgium	Longitudinal	1,235	$M = 14.76$; $SD = 1.41$	52% male, 48% female	Online social support; Private Facebook interactions	Depressive Symptoms—Center for Epidemiological Studies Depression Scale	Private interactions on Facebook were associated with online co-rumination for both male and female adolescents, which in turn was linked to depressive symptoms. However, these interactions also led to increased perceptions of online social support over time, which was associated with decreased depressive symptoms in girls.

(continued)

663

TABLE 2. (CONTINUED)

Study ID	Country	Study design	n	Age in years	Gender	Measure of online social connection	Measure of mental health	Main findings
Hamilton 2021[39]	United States	Longitudinal	110	$M = 12.28$; $SD = $ NA	100% female	EMA peer interactions that occurred via social media and in person	Positive and Negative Affect; Anxiety—Screen for Anxiety Related Emotional Disorders (SCARED)	Negative peer interactions on social media were associated with sustained negative affect, while positive interactions were linked to lower positive emotional reactivity and sustained positive affect.
Kim 2022[22]	South Korea	Longitudinal	403	NA "adolescents (aged 14–16)"	51% male, 49% female	Online social capital	Depressive Symptoms—Center for Epidemiological Studies-Depression scale	Social capital played a crucial moderating role in gaming outcomes. Higher social capital was associated with positive effects of gaming on self-esteem and life satisfaction, while lower social capital was linked to a cycle of increased depression and decreased self-esteem with increased gaming time.
Kysnes 2022[38]	Norway	Cross-sectional study	2,023	$M = 17.4$; $SD = 0.9$	44.4% male, 55.6% female	Sharing something difficult on social media and perceived social support	Mental Well-being—Warwick-Edinburgh Mental Well-being Scale	Sharing difficult experiences on social media was associated with lower well-being, but receiving social support after sharing was linked to higher well-being. Females reported sharing something difficult more than boys but there were no differences in the relationship between sharing and well-being.
Li 2019[34]	China	Cross-sectional study	934	$M = 17.86$; $SD = 1.27$	41.2% male, 58.8% female	Upward social comparison on social networking sites	Depressive Symptoms—Center for Epidemiological Studies Depression Scale	Comparing oneself negatively to others on social media was linked to increased depressive symptoms in adolescents. This relationship was partially explained by feelings of envy and was influenced by individuals' sense of self-efficacy.
Liu 2023[37]	China	Cross-sectional study	1,713	$M = 14.64$; $SD = 1.76$	49.2% male, 50.8% female	Online positive self-disclosure and positive feedback	Social Anxiety	Positive self-disclosure on social networking sites was associated with better friendship quality, mediated by positive feedback. This effect was stronger for individuals with lower social anxiety.
Massing-Schaffer 2022[27]	United States	Longitudinal	630	$M = 11.79$; $SD = 0.70$	51% male, 49% female	Intimate disclosure with online only friends; Comparative friendship quality	Depressive symptoms—Short Mood and Feelings Questionnaire	Descriptive results suggested that online-only friendships are relatively common among youth (38.3%), particularly for those experiencing suicidal ideation (46.3%). Suicidal and nonsuicidal adolescents reported comparable levels of intimate disclosure within their online-only friendships. Although adolescents without suicidal ideation

TABLE 2. (CONTINUED)

Study ID	Country	Study design	n	Age in years	Gender	Measure of online social connection	Measure of mental health	Main findings
								endorsed more support from in-person friendships, suicidal adolescents endorsed similar levels of support from their online-only and in-person friendships. Moderation analyses indicated that the association between both relational victimization and friendship stress and prospective suicidal ideation was attenuated among youth who reported having one or more online-only friend.
Mylek 2023[31]	Czech Republic	Cross-sectional study	1,530	$M = 15.37$; $SD = 1.71$	49.9% male, 50.1% female	Frequency of online communication	Social Anxiety—Social Interaction Anxiety Scale; Depressive Moods —Short Depression-Happiness Scale	Higher social anxiety was associated with less-frequent online communication and self-disclosure, with a stronger effect for offline interactions. Adolescents who experienced more depressed moods used online communication more frequently and self-disclosed more.
Negriff 2019[30]	United States	Longitudinal	454	$M = 13.71$; $SD = 1.39$	42.9% male, 57.1% female	Social network analysis metrics, including: size, density, average degree, number of components, percent in the largest component, diameter, and percent isolates	Depressive Symptoms— Children's Depression Inventory	Higher levels of depressive symptoms predicted smaller and less connected Facebook networks over time.
Politte-Corn 2023[49]	United States	Cross-sectional study	254	$M = 17.39$; $SD = 2.32$	33.1% male, 66.5% female	Online Social Support Scale	Depressive symptoms— Mood and Feelings Questionnaire	Age moderated the effect of online social support on depressive symptoms, with a positive effect for younger adolescents but a negative effect for young adults.
Szwedo 2011[29]	United States	Longitudinal	138	$M = 13.23$; $SD = 0.66$	42.0% male, 58.0% female	Preference for online connection; positive and negative peer relationships on Facebook or MySpace	Depressive Symptoms— Children's Depression Inventory	Initial depressive symptoms predicted a preference for online communication later. However, later depressive symptoms were negatively related to online communication preference, while social anxiety was positively related.

665

Structure:

1. **(+) Protective online-only friendships:** Online connections can serve a protective function, especially for vulnerable individuals.
2. **(-) Smaller networks with depression:** Higher levels of depressive symptoms predicted smaller and less connected online networks.
3. **(+) Compensatory function for lonely:** Online communication can serve as a compensatory function for those with weaker social skills.
4. **(-) Gender-specific usage effects:** The impact of online social structures varies by gender and usage type.

Function:

1. **(+) Self-disclosure benefits:** Positive self-disclosure online was associated with better friendship quality and mental well-being.
2. **(-) Online help-seeking risks:** Willingness to seek online help was associated with increased suicidality risk in some cases.
3. **(+) Social capital development:** Higher online social capital was associated with positive effects on self-esteem and life satisfaction.
4. **(-) Co-rumination risks:** Private online interactions were associated with online co-rumination, which was linked to depressive symptoms.

Quality:

1. **(+) Positive interactions benefits:** Positive online interactions were linked to sustained positive affect.
2. **(-) Negative interactions impact:** Negative online interactions were associated with sustained negative affect.
3. **(+) Perceived social support:** Perceived online social support was associated with lower depressed mood.
4. **(-) Social comparison risks:** Negative social comparisons online were linked to increased depressive symptoms.

FIG. 2. Visual Representation of Results Based on Structure, Function, and Quality.

association between relational victimization or friendship stress and prospective suicidal ideation.[40] This protective role of online friendships was further supported by Anasuyari[28] who found that such connections were negatively associated with loneliness and indirectly linked to better mental health through reduced loneliness. The temporal dynamics of this relationship were explored by Szwedo[41] who found that initial depressive symptoms predicted a preference for online communication later in life. Examining actual network structure rather than communication preferences, Negriff[42] discovered that higher levels of depressive symptoms predicted smaller and less connected Facebook networks over time, suggesting that mental health status can shape the structure of online social networks.

The nature of online interactions varied based on individual differences in mental health. Mýlek[43] found that higher social anxiety was associated with less frequent online communication and self-disclosure. Paradoxically, adolescents who experienced more depressed moods used online communication more frequently and self-disclosed more, possibly as a coping mechanism.[43] This coping aspect was further illuminated by Bonetti et al.[44] who found that lonely children and adolescents used online communication more frequently for personal topics and to compensate for weaker social skills, suggesting that the structure of online interactions may serve a compensatory function for some adolescents.

Gender differences played a role in how online social structures were associated with mental health. Frison and Eggermont[37] observed that the associations between mental health and Facebook use varied by gender and usage type. Passive use in girls and active public use in boys indicated negative associations with mental health.[37] The content of online interactions also mattered; Li[45] found that comparing oneself negatively to others on social media was linked to increased depressive symptoms in adolescents. Despite these varied findings, Charmaraman[31] reported minimal associations between social technology use and adolescent well-being during COVID-19 social distancing, contradicting popular assumptions about the strong link between technology use and well-being. This result suggests that the relationship between online social structures and mental health may be moderated by broader contextual factors.

Function. The function of online social connections, referring to how these connections meet various needs, emerged as a critical factor in adolescent mental health. These functions primarily manifested through self-disclosure, help-seeking behaviors, and the development of social capital. Self-disclosure in online environments showed complex associations with adolescent well-being. Best, Manktelow[29] found that young males who discussed personal issues with online friends reported significantly higher levels of mental well-being. Similarly, Liu et al.[46] observed that positive self-disclosure on SNS was associated with better friendship quality, particularly for individuals with lower social anxiety. However, Kysnes and colleagues[47] reported a more nuanced picture, noting that sharing difficult experiences on social media was initially associated with lower well-being, but receiving social support after sharing was associated with higher well-being. This association was consistent across genders, although females were more likely to share difficult experiences. Frison et al.[38] added to this complexity, finding that private interactions on Facebook were associated with online co-rumination and depressive symptoms for both genders, yet also led to increased perceptions of online social support over time, which was linked to decreased depressive symptoms in girls.

Help-seeking behaviors online presented a similarly intricate picture. Frison and Eggermont[36] found that daily stress increased adolescents' likelihood of seeking support on Facebook. However, Chen et al.[34] discovered that adolescents preferred seeking help from offline peers and friends but were less positive about seeking assistance from online friends or professionals with whom they had not yet developed a real-world connection. Notably, willingness to seek online help was associated with increased suicidality risk, whereas seeking help from peers and friends was linked to decreased risk.[34]

The role of social capital in online interactions emerged as a significant factor, particularly in gaming contexts. Chen and Guo[33] reported that online social capital mediated the relationship between cybervictimization and depression just as offline social capital mediated the relationship between victimization by teachers/peers and depression. Kim et al.[48] found that higher online social capital was associated with positive effects of gaming on self-esteem and life satisfaction,

whereas lower social capital was linked to negative outcomes. Colder Carras and colleagues[35] supported these findings, observing that more social interaction in gaming was associated with fewer problematic symptoms, although depression was more common in heavy gamers overall. Interestingly, they noted gender differences, with female social gamers experiencing less social anxiety and loneliness but lower self-esteem.[35]

Quality. The quality of online social connections, encompassing the positive, helpful, or satisfying nature of interactions, demonstrated significant associations with adolescent mental health outcomes. These associations were evident across various online platforms and activities, including general social media use, gaming, and support-seeking behaviors. Achterhof et al.[27] found that while adolescents experienced more positive emotions when interacting online compared with being alone, face-to-face interactions were associated with the most positive and least negative emotions. This finding was complemented by Hamilton et al.[39] who reported that the quality of peer interactions on social media had lasting emotional effects: negative interactions were associated with sustained negative affect, whereas positive interactions were linked to lower positive emotional reactivity and sustained positive affect. The quality of online relationships also played a crucial role in moderating mental health outcomes. Boursier and colleagues[30] observed that close relationships with online friends moderated the effects of loneliness on adolescents' stress and depression. Similarly, Colder Carras et al.[35] found that in the context of gaming, friendship quality attenuated depression in some male social gamers, although it paradoxically strengthened associations with loneliness in some male nonsocial gamers.

The perception of online social support emerged as a critical factor in determining the quality of online interactions and their impact on mental health. Chen et al.[32] found that online social support moderated the relationship between depression and Internet addiction. Specifically, higher levels of online social support attenuated the indirect effects of depression on Internet addiction through refusal self-efficacy of Internet use, suggesting that online social support served a protective function against problematic Internet use among depressed adolescents. Further, perceived social support on Facebook was associated with lower depressed mood in girls, but when support was sought and not perceived, it increased depressed mood.[36,37] Importantly, the association of online social support quality on mental health could be age-dependent. Politte-Corn and colleagues[49] observed that age moderated the effect of online social support on depressive symptoms, with a positive effect for younger adolescents but a negative effect for young adults.

Discussion

This review synthesized existing literature on the relationship between online social connections and mental health among adolescents, revealing a complex and nuanced interplay between various aspects of online social interactions and adolescent mental well-being. The findings highlight both potential benefits and risks associated with online social connections, underscoring the need for a balanced approach in understanding and addressing adolescent mental health in the digital age.

Structure of online social connections

The structure of online social connections and their impact on adolescent mental health presents a complex and multifaceted landscape that both mirrors and diverges from traditional in-person social dynamics. This complexity is rooted in the unique characteristics of digital environments and the developmental stage of adolescence, a period marked by significant social, emotional, and cognitive changes.[50] Online-only friendships can serve a protective function for vulnerable youth, particularly those experiencing suicidal ideation,[40] aligning with Erikson's theory on the importance of peer relationships in adolescent identity formation.[51] Specifically, Erikson's psychosocial development theory emphasizes that during adolescence, peer relationships become crucial for identity formation as young people navigate the developmental task of establishing a coherent sense of self, with peer feedback and social comparison serving as key mechanisms for testing and solidifying their emerging identity.[51] These digital platforms may offer safe spaces for identity exploration and validation, especially for those struggling with in-person interactions. Increased online communication and self-disclosure among adolescents with depressive symptoms[43] could be viewed through the lens of social compensation and differential susceptibility.[52] The social compensation hypothesis suggests that individuals with weaker offline social skills or fewer face-to-face connections may benefit more from online interactions, as digital platforms allow them to compensate for their offline social deficits through reduced social cues and increased control over self-presentation.[53] Meanwhile, differential susceptibility theory proposes that some individuals are more sensitive to environmental influences than others, experiencing both greater benefits from positive conditions and greater harm from negative conditions compared with less sensitive individuals.[54] However, higher levels of depressive symptoms can also lead to smaller and less connected online networks over time,[42] mirroring social withdrawal patterns observed in offline settings. This suggests that while online platforms offer new connection avenues, they do not necessarily overcome fundamental social challenges associated with mental health issues.

Gender differences in online social media use and its effects reflect broader patterns of gender socialization and communication styles, aligning with research on offline communication where girls typically engage in more intimate self-disclosure than boys.[37,55] The negative effects associated with passive use in girls and active public use in boys indicate that online platforms may amplify certain gendered communication patterns, potentially exacerbating existing vulnerabilities and highlighting the need for gender-specific interventions.

Function of online social connections

The function of online social connections in adolescent mental health reflects a complex interplay between digital interactions and psychological well-being. Self-disclosure online shows mixed effects on mental well-being with its impact dependent on the quality of disclosure and responses received.[29,38,46,47] While online platforms can enhance self-

awareness and empathy, they also increase vulnerability to social comparison and self-doubt.[56,57] Help-seeking behaviors present a nuanced picture, with adolescents preferring offline support,[34] which aligns with traditional adolescent development theories that emphasize the importance of face-to-face peer relationships.[51] However, the facilitation of support-seeking through online platforms[36] suggests that digital spaces can complement, rather than replace, traditional support networks. The concerning association between online help-seeking and increased suicidality risk highlights the need for integrated online and offline mental health support systems.

Social capital in online interactions significantly influences adolescent well-being. Higher online social capital is associated with positive effects on self-esteem and life satisfaction, particularly in gaming contexts.[48,58,59] However, lower social capital online may reinforce existing inequalities, echoing Bourdieu's theory, where social capital is unequally distributed and can reinforce existing inequalities.[60] This digital manifestation of the "rich get richer" hypothesis underscores the need for interventions supporting all adolescents in developing online social skills.[61] The rich get richer hypothesis posits that individuals who already possess strong offline social skills and extensive social networks will derive the greatest benefits from online social opportunities, thereby amplifying their existing social advantages.[62] Future research should explore the transferability of online social capital to offline contexts, informing strategies to help adolescents build resilient social networks across digital and physical realms.

Quality of online social connections

The critical role of perceived social support in online interactions[36,37] highlights the subjective nature of social connection quality. In online contexts, the perception of support may be influenced by various factors such as the immediacy of responses, the depth of interactions, and the perceived authenticity of online connections. The double-edged nature of online support-seeking, where unmet expectations can lead to increased depressed mood, reflects the potential pitfalls of digital communication. This phenomenon aligns with the social comparison theory,[63] as applied to online environments. Adolescents may be particularly vulnerable to negative social comparisons on social media platforms, where curated presentations of peers' lives can exacerbate feelings of inadequacy or lack of support.[57] Furthermore, the quality of online social connections may have long-term implications for adolescent social development. High-quality online interactions that provide genuine emotional support and facilitate self-disclosure may contribute to the development of intimacy and social competence. Conversely, poor-quality online interactions characterized by conflict, misunderstandings, or lack of perceived support may hinder social skill development and contribute to negative social schemas.

Implications and future directions

To address the implications and future directions of this research, we propose leveraging the Six Pillars to Advance Social Connection suggested in the Surgeon General's Report.[23] While originally conceived for holistic social connection, this framework provides a comprehensive approach to leveraging online environments for positive mental health outcomes while mitigating potential risks. By adapting these pillars to the online context, we can develop targeted strategies that address the nuanced findings of this review.

Pillar 1: Strengthen social infrastructure in local communities. The importance of the design of the physical environment can be adapted to the design of digital spaces to promote social connection. Elements from the physical world, such as sense of place, sense of community, and normative behaviors, exist in online environments and can foster healthy social connections through purposeful design. For example, this has been applied in online gaming settings where users are required to use social interaction to accomplish tasks, leading to feelings of connection and sense of community through shared experiences.[64] Expanding research focused on understanding drivers of adolescents' sense of virtual community can inform design guidelines to support positive mental health.[65]

Pillar 2: Enact pro-connection public policies. Additional research is needed to monitor impacts of policies as policymakers look to enact legislation requiring social media platforms to implement strict age verification processes or impose restrictions on certain features for users under 18, such as limiting "infinite scroll" and autoplay functions that can lead to excessive passive consumption.[66] Specifically, it may be preferable to enact policies capitalizing on the benefits of online connectedness while limiting the negative effects instead of a complete ban. For example, promoting the integration of user-friendly tools that encourage active, purposeful engagement over passive browsing, reflecting research findings on the differential effects of active versus passive social media use on adolescent mental health.[37]

Pillar 3: Mobilize the health sector. Health care providers need specialized training to assess the nuanced impacts of online social connections on adolescent mental health, including the potential risks associated with online help-seeking behaviors. Health systems should implement screening tools that evaluate both online social engagement patterns and digital help-seeking tendencies, recognizing that online support can be both beneficial and potentially harmful. Public health organizations should develop evidence-based guidelines for safe online help-seeking and integrate these insights into mental health interventions, ensuring that digital social connections serve as a protective factor for adolescent well-being.

Pillar 4: Reform digital environments. Empowering adolescents to understand and control their online data is crucial for fostering healthy social connections. Online interactions occur within profit-driven ecosystems that may prioritize business goals over social well-being.[67] Increasing transparency about data use and implementing robust safety standards, including age verification and reporting systems, can enhance trust and promote positive social connections in digital environments.

Pillar 5: Deepen our knowledge. Our review underscores the complex relationship between online social connection and adolescent mental health, highlighting the need for more

experimental research. Accelerating research funding and increasing public awareness are crucial, especially given the polarizing views on adolescent social media use. Disseminating findings on leveraging online connections for positive mental health outcomes is essential to inform both public opinion and health practices.

Pillar 6: Cultivate a culture of connection. Promoting core values like kindness, respect, and empathy in adolescents' online interactions can foster pro-social behavior and create safer digital environments.[68] Future research should explore how online platforms can encourage these values through features and policies that reward positive engagement while mitigating risks such as social comparison and cyberbullying.[69]

Rather than focusing solely on reducing social media time, future experimental studies could test interventions designed to optimize online social connections for mental health benefits. Specific experimental directions could include: (a) randomized controlled trials testing the effectiveness of a training to promote active versus passive social media use, where participants are trained and prompted to engage in meaningful online interactions (commenting, sharing, direct messaging) rather than passive browsing; (b) peer support facilitation experiments that connect adolescents with similar mental health challenges through structured online support groups or mentorship programs; (c) digital social skills training interventions that teach adolescents how to seek and provide online social support effectively (similar to mental health first aid programs), including appropriate self-disclosure and boundary-setting; (d) online relationship quality enhancement programs that help adolescents cultivate deeper, more supportive online friendships through guided activities and communication strategies; and (e) experimental studies testing whether online social connection interventions can serve as stepping stones to improved offline social relationships, particularly for socially anxious or isolated adolescents. These intervention approaches would move beyond restriction-based strategies to harness the documented positive potential of online social connections for adolescent mental health.

Limitations

This review was limited by the predominance of cross-sectional studies, which restricts causal inferences. The rapid evolution of online platforms means that some findings may not fully reflect current digital environments. Cultural differences in online behavior and its impact on mental health may not be fully captured due to the focus on English-language studies. In addition, the reliance on self-report measures in many studies may not fully capture the complexities of online social interactions and mental health experiences. The review also did not extensively cover potential differences in online social connections across various socioeconomic backgrounds or among adolescents with different levels of access to digital technologies.

Conclusions

This review reveals the complex interplay between online social connections and adolescent mental health. While online interactions can offer valuable support and self-expression opportunities, they also pose risks of social comparison and inadequate support. The impact varies based on individual factors, interaction quality, and offline resources. As digital technologies evolve, developing strategies to maximize benefits and minimize risks is crucial. Future research and practice should adopt a holistic approach, integrating online and offline social worlds to foster high-quality connections that enhance adolescent well-being and resilience.

Implications and Contribution

This review contributes a comprehensive analysis of online social connections' impact on adolescent mental health, highlighting the complex interplay between digital interactions and well-being. It emphasizes the need for nuanced approaches in research and interventions, considering the structure, function, and quality of online connections. Findings inform strategies to leverage digital platforms for positive mental health outcomes while mitigating potential risks.

Author Disclosure Statement

No conflicts to disclose.

Funding Information

References

1. World Health Organization. Mapping actions of nongovernmental organizations and other international development organizations. 2012. Available from: http://appswhoint/iris/bitstream/handle/10665/44875/9789241503648_eng.pdf
2. Zhang Y, Mavoa S, Zhao J, et al. The association between green space and adolescents' mental well-being: A systematic review. Int J Environ Res Public Health 2020;17(18):6640.
3. Murray CJL, Aravkin AY, Zheng P, et al.; Global Disease Burden Collaborators. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. The Lancet 2020;396(10258):1223–1249.
4. US Department of Health and Human Services. Protecting youth mental health: The US Surgeon General's Advisory. US Department of Health and Human Services; 2021.
5. Kamis C. The long-term impact of parental mental health on children's distress trajectories in adulthood. Soc Ment Health 2021;11(1):54–68.
6. Ohrnberger J, Fichera E, Sutton M. The relationship between physical and mental health: A mediation analysis. Soc Sci Med 2017;195:42–49.
7. Patel V, Flisher AJ, Hetrick S, et al. Mental health of young people: A global public-health challenge. Lancet 2007;369(9569):1302–1313.
8. Saeri AK, Cruwys T, Barlow FK, et al. Social connectedness improves public mental health: Investigating bidirectional relationships in the New Zealand attitudes and values survey. Australian New Zealand J Psychi 2018;52(4):365–374.
9. Wu Y-J, Outley C, Matarrita-Cascante D, et al. A systematic review of recent research on adolescent social connectedness and mental health with internet technology use. Adolescent Res Rev 2016;1(2):153–162.
10. Butler N, Quigg Z, Bates R, et al. The contributing role of family, school, and peer supportive relationships in protecting

the mental wellbeing of children and adolescents. School Ment Health 2022;14(3):776–788.

11. Smit D, Miguel C, Vrijsen JN, et al. The effectiveness of peer support for individuals with mental illness: Systematic review and meta-analysis. Psychol Med 2023;53(11):5332–5341.

12. Snel E, Engbersen G, de Boom J, et al. Social capital as protection against the mental health impact of the COVID-19 pandemic. Front Sociol 2022;7:728541.

13. Singleton A, Abeles P, Smith IC. Online social networking and psychological experiences: The perceptions of young people with mental health difficulties. Comput Human Behav 2016;61:394–403.

14. Charmaraman L, Sode O, Bickham D. Adolescent mental health challenges in the digital world. Technology and adolescent health: Elsevier; 2020. pp. 283–304.

15. Hogan M, Strasburger VC. Social media and new technology: A primer. Clin Pediatr (Phila) 2018;57(10):1204–1215.

16. Prochnow T, Patterson MS, Hartnell L. Social support, depressive symptoms, and online gaming network communication. MHSI 2020;24(1):49–58.

17. Prochnow T, Patterson MS, Hartnell L, et al. Depressive symptoms associations with online and in person networks in an online gaming community: A pilot study. MHRJ 2020;25(1):21–33.

18. Prochnow T, Patterson MS, Hartnell L, et al. Online gaming network communication dynamics, depressive symptoms, and social support: A longitudinal network analysis. Sociol Focus 2023;56(3):272–283.

19. Valkenburg PM, van Driel II, Beyens I. The associations of active and passive social media use with well-being: A critical scoping review. New Media Socie 2022;24(2):530–549.

20. Zhang X. The impact of online socialization on adolescent mental health: The mediating role of friendship quality and family relationships. New Dir Child Adolesc Dev 2023; 2023(1):1–10.

21. Khalaf AM, Alubied AA, Khalaf AM, et al. The impact of social media on the mental health of adolescents and young adults: A systematic review. Cureus 2023;15(8):e42990.

22. Kwak Y, Kim H, Ahn J-W. Impact of internet usage time on mental health in adolescents: Using the 14th Korea youth risk behavior web-based survey 2018. PLoS One 2022; 17(3):e0264948.

23. US Department of Health & Human Services. Our epidemic of loneliness and isolation: The US Surgeon General's Advisory on the healing effects of social connection and community. US Department of Health & Human Services; 2023.

24. Covidence. Covidence systematic review software; 2017.

25. Jarde A, Losilla J-M, Vives J. Methodological quality assessment tools of non-experimental studies: A systematic review. Ann Psychol 2012;28(2):617–628.

26. Downs SH, Black N. The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. J Epidemiol Community Health 1998;52(6):377–384.

27. Achterhof R, Kirtley OJ, Schneider M, et al. Adolescents' real-time social and affective experiences of online and face-to-face interactions. Computers in Human Behavior. 2022;129:N.PAG-N.NPAG.

28. Anasuyari NKY, Latifah M, Yuliati LN. Adolescents' mental health during the COVID-19 pandemic: Do loneliness, family, and online friends matter? Humanitas 2023;20(1):53–68.

29. Best P, Manktelow R, Taylor BJ. Social work and social media: Online help-seeking and the mental well-being of adolescent males. Br J Soc Work 2016;46(1):257–276.

30. Boursier V, Gioia F, Musetti A, et al. COVID-19-related fears, stress and depression in adolescents: The role of loneliness and relational closeness to online friends. J Hum Behav Soc Environ 2023;33(2):296–318.

31. Charmaraman L, Lynch AD, Richer AM, et al. Examining early adolescent positive and negative social technology behaviors and well-being during the COVID-19 pandemic. Technol Mind Behav 2022;3(1):10.1037/tmb0000062.

32. Chen K-C, Liu S, Lin M-P, et al. A moderated mediation model of the relationship between depression and internet addiction: Mediation by refusal self-efficacy of internet use and moderation by online and real-life social support. Int J Ment Health Addiction 2024;22(3):1649–1661.

33. Chen Q, Guo S, Zhou Q. A structural equation model investigating the relationships among online and offline social capitals and child polyvictimization. Child Family Social Work 2022;27(4):688–699.

34. Chen SS, Lam TP, Lam KF, et al. The use of close friends on Instagram, help-seeking willingness, and suicidality among Hong Kong youth: Exploratory sequential mixed methods study. J Med Internet Res 2022;24(10):e37695.

35. Colder Carras M, Van Rooij AJ, Van de Mheen D, et al. Video gaming in a hyperconnected world: A cross-sectional study of heavy gaming, problematic gaming symptoms, and online socializing in adolescents. Comput Human Behav 2017;68:472–479.

36. 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.

37. Frison E, Eggermont S. Exploring the relationships between different types of Facebook use, perceived online social support, and adolescents' depressed mood. Soc Sci Compu Review 2016;34(2):153–171.

38. Frison E, Bastin M, Bijttebier P, et al. Helpful or harmful? The different relationships between private Facebook interactions and adolescents' depressive symptoms. Media Psychol 2019;22(2):244–272.

39. Hamilton JL, Do QB, Choukas-Bradley S, et al. Where it hurts the most: Peer interactions on social media and in person are differentially associated with emotional reactivity and sustained affect among adolescent girls. Res Child Adolesc Psychopathol 2021;49(2):155–167.

40. Massing-Schaffer M, Nesi J, Telzer EH, et al. Adolescent peer experiences and prospective suicidal ideation: The protective role of online-only friendships. J Clin Child Adolesc Psychol 2022;51(1):49–60.

41. Szwedo DE, Mikami AY, Allen JP. Qualities of peer relations on social networking websites: Predictions from negative mother-teen interactions. J Res Adolesc 2011;21(3):595–607.

42. Negriff S. Depressive symptoms predict characteristics of online social networks. J Adolesc Health 2019;65(1):101–106.

43. Mýlek V, Dedkova L, Schouten AP. Adolescents' online communication and self-disclosure to online and offline acquaintances: Differential effects of social anxiety and depressed moods. Journal of Media Psychology: Theories, Methods, and Applications 2023.

44. Bonetti L, Campbell MA, Gilmore L. The relationship of loneliness and social anxiety with children's and adolescents'

online communication. Cyberpsychol Behav Soc Netw 2010; 13(3):279–285.

45. Li Y. Upward social comparison and depression in social network settings. INTR 2019;29(1):46–59.

46. Liu L, Zhang T, Han L. Positive self-disclosure on social network sites and adolescents' friendship quality: The mediating role of positive feedback and the moderating role of social anxiety. Int J Environ Res Public Health 2023;20(4):3444.

47. Kysnes B, Hjetland GJ, Haug E, et al. The association between sharing something difficult on social media and mental well-being among adolescents. Results from the "LifeOnSoMe"-study. Front Psychol 2022;13:1026973.

48. Kim GM, Jeong EJ, Lee JY, et al. Role of social capital in adolescents' online gaming: A longitudinal study focused on the moderating effect of social capital between gaming time and psychosocial factors. Front Psychol 2022;13:931134.

49. Politte-Corn M, Nick EA, Kujawa A. Age-related differences in social media use, online social support, and depressive symptoms in adolescents and emerging adults. Child Adolesc Ment Health 2023;28(4):497–503.

50. Steinberg LD. Age of Opportunity: Lessons from the New Science of Adolescence: Houghton Mifflin Harcourt; 2014.

51. Erikson EH. Identity youth and crisis: WW Norton & company; 1968.

52. Valkenburg PM, Peter J. The differential susceptibility to media effects model. J Commun 2013;63(2):221–243.

53. Zywica J, Danowski J. The faces of Facebookers: Investigating social enhancement and social compensation hypotheses; predicting Facebook™ and offline popularity from sociability and self-esteem, and mapping the meanings of popularity with semantic networks. J Computer-Mediated Comm 2008;14(1):1–34.

54. Assary E, Krebs G, Eley TC. Practitioner review: Differential susceptibility theory: Might it help in understanding and treating mental health problems in youth? J Child Psychol Psychiatry 2023;64(8):1104–1114.

55. Rose AJ, Rudolph KD. A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. Psychol Bull 2006;132(1):98–131.

56. Piaget J. Intellectual evolution from adolescence to adulthood. Hum Dev 2008;51(1):40–47.

57. Nesi J, Prinstein MJ. Using social media for social comparison and feedback-seeking: Gender and popularity moderate associations with depressive symptoms. J Abnorm Child Psychol 2015;43(8):1427–1438.

58. Spottswood EL, Wohn DY. Online social capital: Recent trends in research. Curr Opin Psychol 2020;36:147–152.

59. Prochnow T, Patterson MS. It's not just a game: Social networks, isolation and mental health in online gamers. JPMH 2024;23(2):140–153.

60. Siisiainen M. Two concepts of social capital: Bourdieu vs. Putnam. Intr J Contemporary Sociol 2003;40(2):183–204.

61. Kraut R, Kiesler S, Boneva B, et al. Internet paradox revisited. J Soc Issues 2002;58(1):49–74.

62. Cheng C, Wang H-y, Sigerson L, et al. Do the socially rich get richer? A nuanced perspective on social network site use and online social capital accrual. Psychol Bull 2019; 145(7):734–764.

63. Suls J, Wheeler L. Social Comparison Theory. Handbook of Theories of Social Psychology. Sage; 2012;1:460–82.

64. Gui DAF. Virtual sense of community in a world of Warcraft® storytelling open forum thread. JVWR 2018;11(2).

65. Koh J, Kim Y-G, Kim Y-G. Sense of virtual community: A conceptual framework and empirical validation. Intr J Electronic Commerce 2003;8(2):75–94.

66. Throuvala MA, Griffiths MD, Rennoldson M, et al. Motivational processes and dysfunctional mechanisms of social media use among adolescents: A qualitative focus group study. Comput Human Behav 2019;93:164–175.

67. Massey PM, Murray RM, Chiang SC, et al. Social media, public health research, and vulnerability: Considerations to advance ethical guidelines and strengthen future research. JMIR Public Health Surveill 2023;9:e49881.

68. Colì E, Paciello M, Lamponi E, et al. Adolescents and trust in online social interactions: A qualitative exploratory study. Children 2023;10(8):1408.

69. Wadsley M, Covey J, Ihssen N. The predictive utility of reward-based motives underlying excessive and problematic social networking site use. Psychol Rep 2022;125(5): 2485–2516.

Address correspondence to:
Dr. Tyler Prochnow
Department of Health Behavior
Texas A&M University
School of Public Health
212 Adriance Lab Rd
College Station, TX 77843
USA

E-mail: tprochnow@tamu.edu