



# Social Media and Suicide Risk in Youth

Lisa H. Jaycox, PhD; Eric R. Murphy, PhD; Julia L. Zehr, PhD; Jane L. Pearson, PhD; Shelli Avenevoli, PhD

## Abstract

**IMPORTANCE** Youth, parents, educators, and policymakers are concerned about the potential relationship between social media use and negative mental health outcomes, including risk for suicidal thoughts and behaviors.

Author affiliations and article information are listed at the end of this article.

**OBSERVATIONS** Current research shows complex and conflicting relationships between social media use and suicide risk. A key limiting factor in clarifying these relationships is a dearth of available information on contextual factors around social media use, with most research focusing only on hours or amount of engagement. Whereas there are clear associations between some types of social media use and suicide risk, there are also many opportunities to mitigate suicide risk through social media. Several methodologic and measurement issues make research challenging. Researchers have only begun to explore how specific risk factors interact with individual vulnerabilities, how social media can be used to enhance youth well-being, and whether and under what circumstances mitigation strategies can be helpful.

**CONCLUSIONS AND RELEVANCE** This overview identifies research gaps and methodological challenges that need to be addressed to guide intervention strategies and future policy relevant to youth and suicide risk.

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## Introduction

Epidemiological studies suggest that youth suicide incidence is rising. Suicide death rates for children and young adults aged 10 to 24 years increased by 62% from 2007 (6.8 per 100 000 individuals) to 2021 (11.0 per 100 000 individuals),<sup>1</sup> although provisional numbers from 2022 show a slight decline for both children aged 10 to 14 years and adolescents and young adults aged 15 to 24 years.<sup>2</sup> These death rates were accompanied by steady increases in reports of suicidal thoughts and behaviors over the period of 2013 to 2023 on a leading health surveillance survey for US high school youth, the Youth Risk Behavior Survey.<sup>3</sup> Specifically, in 2023, significantly more youth reported making a suicide plan in the prior year (16%) compared with 14% in 2011. Suicide attempts increased over the period 2013 to 2023 from 8% to 9%. In 2023, female and LGBTQ+ (lesbian, gay, bisexual, transgender, queer, nonbinary or gender conforming, plus) individuals were at higher risk than male individuals for each kind of suicidal behavior measured.

Speculation on factors contributing to rising suicide risk includes rapidly evolving technology and the expansion of youth use of social media over this time period.<sup>4,5</sup> Recently, there have been calls from the US Surgeon General<sup>6,7</sup> and professional organizations<sup>8</sup> to better understand the impact of social media and digital technology use on mental health and child development. They urge the technology industry, researchers, health practitioners, educators, and policy makers to identify ways to decrease risks, increase safety, and leverage social media and digital technologies to support mental health.

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Research findings on the relationship between social media and mental health are mixed; a consensus study completed by the National Academy of Sciences, Engineering, and Medicine (NASEM) found evidence for potential harms as well as potential benefits for youth.<sup>12</sup> Potential harms include unhealthy social comparisons, displacement of healthy activities including sleep, and interference with the development of attentional control; whereas benefits include the ability to connect with friends and family, find support, and learn and gain skills.<sup>12</sup> The report highlights the complexity of associations and the need for more research on the mechanisms through which social media use may contribute to risk for mental health problems in youth, including suicidal thoughts and behaviors, or may be leveraged to mitigate these risks.

In this communication, we highlight the current state of research on social media use related to increased suicide risk and the potential benefits of social media. We identify methodological challenges that have impeded a more precise understanding of the specific mechanisms of risk and their mitigation and describe efforts to promote this type of research. We focus on adolescents and young adults as most of the current empirical evidence comes from this age group, although research on younger children and adults is also warranted. We aim to highlight current gaps in knowledge that, once filled, will enable us to more efficiently and effectively make decisions about how to allocate resources to create a safe and supportive digital media environment.

We define social media as a subtype of technology and digital media. This is consistent with a health advisory from the Surgeon General,<sup>6,7</sup> in which he defined social media as "internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others."<sup>9</sup> Social media are defined here as including different avenues (eg, platforms, texting, gaming, chats, videos) across different hardware platforms (eg, phones, computers, gaming systems with social interaction), and included both passive and active use via social and nonsocial activities.<sup>10</sup> We define suicidal behavior to include suicide ideation, suicide intent, suicide attempts, and death by suicide, although some of research cited includes nonsuicidal self-injury.

## Findings

### Key Methodological Challenges

Several important methodological challenges exist in studying social media and suicide risk among youth (Box). First, social media technology changes rapidly,<sup>11</sup> and these changes outpace research efforts. Thus, research needs to be designed to understand how different features of social media platforms shape youth behavior and/or risk to allow for generalizability to the changing digital ecosystem. Second, patterns of use are not static and can change at the individual level. For instance, individuals experiencing stress or mental health problems may be drawn to social media and may increase their usage; thus, fine-grained longitudinal data are needed to unpack this association and elucidate factors contributing to risk. Third, ethical issues related to youth privacy and research on suicidal thoughts and behaviors present challenges for study design, including how to manage parental consent and participant safety in studies with online recruitment. Fourth, social media algorithms, designed to optimize user experience and maximize engagement, create a unique and personalized experience for each user. Access to content-level data and engagement metrics is vital for understanding relationships between social media behaviors and risk, but to date researchers do not have access to the algorithms or the data they need to study them. To address this issue, the NASEM consensus report called for Congress to mandate that tech companies provide access to data for research purposes.<sup>12</sup>

Even with better access to data, several measurement issues can hinder research progress in this field. The use of anonymous or multiple accounts limits interpretation of findings and may mask particularly problematic use patterns. Measurement issues extend to the constructs of suicide risk themselves. The assessment of suicide risk varies across the empirical research, with some studies

### Box. Key Methodological Challenges

- Rapidly changing technology and usage patterns at the population and individual levels
- Ethical and privacy issues
- Algorithms ensure personalized experiences, but data on user experience are limited
- Anonymous accounts and multiple accounts
- Measurement issues for both suicide risk and social media usage

aggregating suicide outcomes (suicide thoughts combined with behaviors) due to the lower numbers of suicide attempts, as in the Adolescent Brain Cognitive Development (ABCD) study.<sup>13</sup> Other studies focus on specific aspects of suicidality (ideation, nonsuicidal self-injury, planning and/or attempt, suicidal thoughts and behaviors, or death by suicide), making relationships between social media use and suicidality challenging to compare across studies. Similarly, the field has not defined a set of social media markers and measures that are relevant to clinical risk. For example, important information relating to youth mental health and suicidality may be measurable across multiple social media domains, including semantic content, facial expressions in visual content, help-seeking behaviors, emoji use, engagement behaviors (eg, likes, shares), or passive sensing of locomotor and geographic movements. Constructs that can be observed on social media that may serve as precursors to suicide behaviors, such as word and language usage patterns (eg, Coppersmith et al<sup>14</sup>) and increased viewing behavior of self-harm and death-related imagery (eg, Susi et al<sup>15</sup>), need more refinement to advance understanding of risk trajectories, particularly among different youth cultural or identity groups (such as preteen youth). In sum, measurement issues need to be resolved to better understand relationships between social media use and youth suicidality, as well as what measures might serve as predictive indicators of risk.

### Association Between Social Media and Suicide Risk

Little is known about the mechanisms by which social media may influence suicide risk. Early studies focused on duration of screentime, and although a 2019 systematic review<sup>16</sup> showed an association between heavy social media or internet use and suicide attempts, 2 of the 9 studies reviewed showed that suicidal risk was decreased among youth with some use compared with those with no use. A second review including time spent on sites with suicidal content (eg, self-harm websites, forums) found mixed evidence for a link between increased time and self-harm or suicide attempts.<sup>17</sup> Using prospective data collection, findings from the ABCD study suggest that self-reported screen time (including social media, texting, watching videos, and gaming) was positively associated with aggregate suicide risk (suicide ideation, planning, and/or attempts) 2 years later.<sup>13</sup> The mixed findings are likely dependent on a number of factors, including variation in the measure of screentime duration. More importantly, this crude measure of social media behavior does not capture individual differences in content exposures, youth motivations, youth social experiences, or the algorithmic and interactive features of different platforms that may contribute to risk or resilience for suicidal thoughts and behaviors. Social ties cultivated via social media include a variety of types (close ties, loose ties, strangers); social networks can confer suicide risk and are seen as a potential prevention target.<sup>18</sup>

Two complementary hypotheses suggest how social media use is linked to youth mental health outcomes. The first is that social media may act as an amplifier of known risks for suicide in youth, such as sleep disturbance or insomnia, distress, depression, hopelessness, withdrawal or social isolation, social stressors, bullying, and exposure to suicidal behavior in inspiring role models.<sup>16,19,20</sup> This relationship can interact with more consistent individual risk factors such as sex, age, gender identity, sexual orientation, prior suicidal behavior, and prior adverse experiences. A 2024 study<sup>21</sup> supported this hypothesis: online racial discrimination was related to suicidal ideation among Black adolescents, and this relationship was fully mediated by symptoms of posttraumatic stress disorder.

The second hypothesis is that social media may introduce novel exposures not commonly experienced prior to the era of social media. Social media platforms have characteristics that differ from direct in-person interactions, including permanence, broad public reach, constant availability, and asynchronous interaction, any of which could serve to increase the impact of negative social interactions. For example, exposure to cyberbullying has been linked to self-harm and suicidal behavior in young people in several studies.<sup>22-24</sup> The rapid dissemination of information on social media may heighten risk by facilitating what has been termed suicide "clusters" (defined as a greater-than-expected number of cases among a group of people close in time<sup>25</sup>) after someone dies by suicide (eg, Swedo et al<sup>26</sup>). Easier access to potentially harmful content, such as material that

promotes or instructs on self-harm, could exacerbate risk.<sup>17,27</sup> Similarly, there have been anecdotal reports of risk related to viral challenges unique to social media.<sup>28,29</sup>

### Opportunities and Moderators of Risk via Social Media

In order to understand the association between social media and suicide risk more clearly, we need more research on potential moderating and mitigating factors that are emerging. First, social media has promise as a vehicle for suicide risk reduction and prevention strategies. Social media sites offer opportunities for social connection and inclusion, factors known to promote resilience in youth.<sup>30</sup> Engagement with social media also offers youth the possibility of forging positive social connections and building an online social community,<sup>31,32</sup> especially for anxious or withdrawn individuals or marginalized youth such as transgender or nonbinary youth.<sup>33</sup>

Second, social media offer opportunities to identify youth at risk more quickly. At the individual level, new computational detection strategies are being harnessed to predict who is most at risk in real time from social media behaviors.<sup>14,34-36</sup> At the community level, "nowcasting" suicide rates using multiple forms of online data, including social media posts, can help to identify community clusters of elevated risk on a weekly basis, instead of waiting for official data to emerge.<sup>37</sup> Some recent applications of these detection tools are used by schools to respond to students who seem to be at increased risk based on their patterns of internet and social media use.<sup>38</sup>

Another way to mitigate potential harms of social media is to optimize the way they are used and delivered. Mitigation strategies are being developed for both the user side and the technology side. On the user side, there are efforts to improve social media literacy, such as through the new Center of Excellence on Social Media and Youth Mental Health.<sup>39</sup> If effective, social media literacy could benefit both youth and parents in understanding potential risks and considering healthy use of the technology. On the social media provider side, tech companies and app developers have a role in exacerbating or mitigating risk, as expressed by the US Surgeon General and the White House.<sup>6,7,40</sup> For instance, the 988 Suicide and Crisis Lifeline has instructions on how to remove potentially harmful content from various social media platforms.<sup>41</sup> However, these strategies have not been evaluated yet in terms of their feasibility, acceptability, or impact. Evidence is needed to refine the guidelines and recommendations that are currently proliferating in response to the Surgeon General's advisory.

Finally, adolescents can receive helpful information and interventions via social media platforms, through algorithms and suggested content about the types of help that are available and how to seek help. Social media platforms, content delivery, and online communication can play a prominent role in digital health interventions that target underserved adolescents at risk.<sup>42-45</sup>

To clearly identify and quantify the ways in which social media might mitigate risks and offer protective benefits, we need access to more granular data on the type of social media use to things like content, contextual variables, and intention for use in addition to time spent on the internet. Research on these factors and how they interact with an individual's specific vulnerabilities and sources of resilience can lead to specific strategies as the field moves forward.

### Summary of Research Gaps

Measurement of social media use in current empirical research has mostly focused on amount of time spent on social media, but more nuanced information is needed to advance our understanding of the harms and benefits of social media use and inform policy to enhance safety and minimize risk. Additionally, it is unclear which aspects of social media use are most predictive of suicide risk. Better characterization of usage patterns, youth motivations and intentions, and content analysis will help to move the field forward. Moreover, we need to better understand how usage patterns interact with age and development as well as an individual's specific vulnerabilities and sources of resilience, peer and family supports, mental health status, and digital literacy. As one example, there is a paucity of research available on clinical populations who might have different risks than community samples.<sup>46</sup> More granular data are needed to identify the potential levers for prevention and intervention.

There is also minimal understanding of the potential moderating and mitigating factors that operate in the association between social media use and suicide risk. If social media use affects suicidal behavior through mental health or sleep, then more could be done to bring evidence-based intervention strategies to bear on these problems, including through social media itself. Mitigation strategies and recommendations to parents, tech companies, and youth are being developed but need to be tested to ensure that they are, indeed, improving the experience of youth, enhancing mental health, and preventing harm. Likewise, we also need to understand whether and how restricting social media use could have adverse effects. Moreover, there is substantial potential for digital health interventions to expand access to suicide preventive care by augmenting skill acquisition and mastery of intervention strategies, improving adherence to intervention protocols, and allowing for more frequent assessment of mental health status.<sup>47</sup> Once digital health interventions have an evidence-base, sustainability of these benefits need to be tested in workflows, including practice and billing codes.

### What the National Institutes of Health Is Doing to Fill These Gaps

With the goal of advancing our understanding of this complex association, the National Institutes of Health (NIH) has supported several recent workshops to outline the current state of science and has solicited applications to stimulate new research in this area. NIH's Office of Behavioral and Social Sciences Research hosted a workshop, "Understanding and Addressing the Impacts of Online Harassment and Abuse," in December 2023, and the National Institute of Child Health and Human Development (NICHD) and National Institute of Mental Health (NIMH) hosted the "Impact of Technology and Digital Media on Child and Adolescent Development and Mental Health" workshop in April 2024. The NIMH solicited applications through funding opportunities (eg, RFA-MH-24-180, RFA-MH-24-181) for studies that use fine-grained approaches to assess social media use, employ youth advisory boards, and examine the mechanisms through which social media may influence mental health outcomes. Of note, these Requests for Applications (RFAs) specifically highlighted the need to understand bidirectional influence between adolescent social media use and mental health. NICHD also supports work that examines how exposure to digital media affects a variety of aspects of child development (eg, RFA-HD-22-009).

NIH also collaborated with federal partners to author a report with recommendations to improve youth online health and safety. Specifically, the Kids Online Health and Safety task force, convened by the Substance Abuse and Mental Health Services Administration (SAMHSA), compiled a series of recommendations for protecting the mental health, safety, and privacy of youth who are using social media and other online platforms, as well as areas for future research.<sup>48</sup>

NIH supports a variety of projects related to digital media and general health, as well as projects that focus on suicide specifically. In addition, NIMH is funding work related to digital health interventions. It hosted a workshop entitled "Digital Health Interventions" in July 2022, and is supporting research on digital suicide prevention for cyberbullied adolescents. NIMH also funds studies in which passive monitoring of smartphone data and self-reported social media use information are used to develop risk predictors for adolescent suicidal thoughts and behaviors. This research will likely shed light on some of the gaps described in this overview.

### Conclusions

Social media use is an integral part of youth interactions and peer relationships. Given concerns about its impact on youth,<sup>6,7</sup> there is a clear need for additional research to understand its potential risks and benefits. Specifically, we need to improve measurement of youth social media behaviors and identify those pathways and mechanisms that increase risk, as well as those that mitigate risk in terms of individual and exposure factors. As new strategies for mitigating risk are developed, they need to be tested to know whether, and for whom, they reduce risk and to ensure they do not inadvertently increase risk. In this rapidly evolving landscape, it will be difficult to address every

potential new path of risk for youth. However, by understanding the broad contours of how use patterns and content exposure may contribute to youth suicide risk, policies, regulations, and society may be better able to buffer against those risks in the digital ecosystem. Social media also plays a positive role in providing information, social support, and connection to young people, and can be leveraged to enhance mental health through digital and technology advances, but much more work is needed to test and disseminate these strategies. To conduct critical research that can inform practice and policy, in line with the recent NASEM report, more transparency and data sharing are needed from social media platforms in order to carry out new research.<sup>12</sup>

## ARTICLE INFORMATION

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**Corresponding Author:** Lisa H. Jaycox, PhD, National Institute of Mental Health, National Institutes of Health, 6001 Executive Blvd, Bethesda, MD 20852 ([lisa.jaycox@nimh.gov](mailto:lisa.jaycox@nimh.gov)).

**Author Affiliations:** National Institute of Mental Health, National Institutes of Health, Bethesda, Maryland.

**Author Contributions:** Dr Jaycox had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

*Concept and design:* All authors.

*Drafting of the manuscript:* Jaycox, Murphy, Zehr, Pearson.

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