

Effect of social media on Mental Health

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Abstract—The widespread adoption of social media has fundamentally altered communication, social interaction, and information exchange, particularly among adolescents and young adults who represent the most active users of digital platforms. While social media offers benefits such as social connection, self-expression, psychoeducation, and access to mental health resources, growing evidence indicates that excessive or problematic use may adversely affect mental health. This review critically examines the epidemiology of social media use, its association with mental health outcomes, underlying mechanisms, vulnerable populations, and implications for pharmacy practice. Evidence from systematic reviews and meta-analyses suggests that higher intensity or problematic social media use is associated with increased symptoms of depression, anxiety, sleep disturbances, low self-esteem, loneliness, and signals related to self-harm and suicidality, particularly among adolescents. Key mechanisms linking social media use to mental health outcomes include social comparison, passive consumption, cyberbullying, fear of missing out, sleep displacement, and algorithmic amplification of emotionally charged or harmful content. However, the effects are heterogeneous and moderated by factors such as age, gender, pre-existing mental health conditions, type of platform, and motives for use. Importantly, social media also presents opportunities for mental health promotion through psychoeducation, peer support, and digitally delivered interventions when supported by ethical design and appropriate safeguards. Pharmacists, as accessible healthcare professionals, are well positioned to screen for problematic digital behaviors, provide counseling on healthy social media use and sleep hygiene, support medication adherence, and facilitate referral to mental health services. Despite a growing evidence base, limitations such as reliance on cross-sectional designs, inconsistent measurement of social media exposure, and rapidly evolving platforms highlight the need for longitudinal research, standardized assessment tools, and evaluation of pharmacy-led interventions. A balanced, evidence-informed approach is essential to maximize the benefits

of social media while minimizing risks to mental well-being.

Index Terms—social media, mental health, depression, anxiety, adolescents, social comparison

I. INTRODUCTION

The rapid expansion of social media platforms has profoundly transformed the way individuals communicate, access information, and perceive themselves and others. Social media refers to digital platforms that enable users to create, share, and interact with content and virtual communities in real time. Platforms such as Facebook, Instagram, TikTok, Snapchat, YouTube, and X (formerly Twitter) have become deeply embedded in daily life, particularly among adolescents and young adults. According to global usage estimates, a significant proportion of individuals aged 13–35 years engage with social media multiple times per day, often for extended durations. While these platforms offer opportunities for social connection, self-expression, education, and health communication, growing evidence suggests that excessive or problematic use may have adverse consequences for mental health. Mental health disorders, including depression, anxiety, stress-related disorders, and sleep disturbances, are increasing worldwide and represent a major public health concern. Adolescents and young adults, who are the most active users of social media, are also among the most vulnerable populations for developing mental health problems. This temporal overlap has led researchers and healthcare professionals to explore potential associations between social media use and mental well-being. Studies have demonstrated that higher frequency and intensity of social media engagement may be associated with increased symptoms of depression, anxiety, low self-esteem,

loneliness, and suicidal ideation. At the same time, social media has also been shown to provide emotional support, peer interaction, and access to mental health resources, indicating a complex and bidirectional relationship. [1-3]

Several mechanisms have been proposed to explain how social media influences mental health outcomes. These include social comparison, exposure to idealized or unrealistic representations of life and body image, cyberbullying, fear of missing out (FOMO), and disruption of sleep patterns due to prolonged screen time. Additionally, algorithm-driven content delivery may amplify emotionally charged or harmful material, potentially reinforcing negative thought patterns. Importantly, individual factors such as age, gender, personality traits, preexisting mental health conditions, and patterns of social media use (active versus passive engagement) may modify these effects. For pharmacy students and pharmacists, understanding the mental health implications of social media use is increasingly relevant. Pharmacists are among the most accessible healthcare professionals and frequently interact with patients experiencing mental health conditions or using psychotropic medications. Awareness of social media-related mental health risks can support early identification of vulnerable individuals, improve patient counseling, enhance medication adherence, and facilitate timely referral to mental health services. Therefore, this review aims to critically examine existing literature on the effects of social media on mental health, explore underlying mechanisms, identify at-risk populations, and discuss implications for pharmacy education and clinical practice. [4-5]

II. EPIDEMIOLOGY: WHO USES SOCIAL MEDIA AND HOW MUCH?

Globally, social media use is most prevalent among adolescents and young adults, making this population a primary focus in studies examining its mental health effects. Adolescence and early adulthood represent developmental stages characterized by heightened social sensitivity and identity formation, during which digital communication plays a central role. Large-scale population surveys consistently demonstrate that the majority of individuals aged 13–29 years use at least one social media platform daily, with many reporting engagement across multiple

platforms. Popular platforms such as YouTube, TikTok, Instagram, and Snapchat dominate usage among teenagers, while young adults also maintain active presence on platforms like Facebook and X (formerly Twitter). A significant proportion of adolescent's report being online "almost constantly," reflecting not only increased access to smartphones but also the integration of social media into educational, recreational, and social activities.

Patterns of social media use vary considerably across age groups, cultures, and platforms, and these differences are epidemiologically important when assessing mental health outcomes. Time spent on social media ranges from brief, intermittent use to prolonged daily exposure exceeding three to five hours, with higher durations generally reported among adolescents compared to older adults. Additionally, the nature of engagement differs: active use, such as posting content, commenting, or direct messaging, contrasts with passive use, which involves scrolling through feeds and consuming content without interaction. Epidemiological evidence suggests that passive consumption is more common and may be more strongly associated with negative mental health outcomes, including depressive symptoms and reduced life satisfaction. Cultural and socioeconomic factors further influence usage patterns, as access to digital technology, parental monitoring, and social norms vary widely between regions. Understanding these epidemiological trends is essential, as both the intensity and quality of social media engagement act as key moderators in the relationship between social media use and mental health. [6-8]

III. SUMMARY OF CORE FINDINGS

Association with depression and anxiety

Multiple systematic reviews and meta-analyses report a positive association between higher or problematic social media use and symptoms of depression and anxiety. Association strength varies by study design (cross-sectional vs longitudinal), measurement of "use" (time vs problem use), and population. Problematic or addictive patterns of use show stronger links to depressive and anxious symptomatology. [9-10]

Sleep disturbance and mental health

Evidence consistently links nighttime social media use especially screen exposure before bedtime and sleep displacement with poorer sleep quality, shorter sleep duration, and subsequent increases in depressive and anxiety symptoms. Sleep disruption is a robust mediator between social media use and mental health outcomes in many adolescent studies. [11]

Loneliness, social anxiety, and self-esteem

Findings are mixed: some studies show increased loneliness and social anxiety with heavier social media use (especially passive consumption and comparison behaviors), while others suggest social media can relieve loneliness for individuals who lack offline connections. The direction and magnitude of effects often depend on motives for use and type of engagement. [12-13]

Self-harm and suicidality signals

Systematic reviews and clinical surveillance have flagged links between certain social media activities and increased self-harm behaviors and suicidality among adolescents. Exposure to self-harm content, normalization of suicidal behaviors, and contagion effects are potential concerns; conversely, supportive online communities can sometimes reduce isolation. Careful moderation and clinical awareness are required. [14]

Benefits and opportunities

Social media can facilitate peer support, increase access to psychoeducation, reduce stigma, and deliver scalable interventions (e.g., CBT modules, group support). Meta-analyses of social-media-based mental health interventions show promise but also highlight variability in design and the need for safety measures and moderation. [15]

Mechanisms linking social media and mental health

Understanding mechanisms helps clinicians assess risk and design interventions. Major mechanisms include:

Social comparison and body image

Platforms emphasizing images (Instagram, TikTok) foster upward social comparison, which can erode self-esteem and body satisfaction and increase

depressive symptoms, particularly in adolescent girls.[16]

Passive vs active use

Passive consumption (endless scrolling, viewing others' curated highlights) is more strongly linked to negative affect than active, engaged behaviors (direct messaging, supportive interactions).[17]

Cyberbullying and harassment

Online harassment is associated with increased depressive symptoms, anxiety, and even self-harm. Pharmacy students must recognize that victims may be reluctant to disclose online abuse.[18]

Algorithmic amplification and exposure to harmful content

Algorithms prioritize engagement and may amplify emotionally charged or sensational content (including misleading mental health narratives), which can distort self-perception and encourage harmful behaviors. Investigative reporting highlights how certain mental-health-related content persists in feeds and can be "sticky," complicating recovery.

Sleep displacement and circadian disruption

Nighttime device use suppresses melatonin and shortens sleep; sleep disruption contributes to mood dysregulation and cognitive difficulties, mediating part of social media's impact on mental health. [19-20]

Problematic use and addiction-like features

Symptoms such as craving, withdrawal, and loss of control around social media have been identified and relate to worse mental health. Those with preexisting conditions may be especially prone to problematic use. [21]

Vulnerable populations and moderators

Risk is not uniform. Key moderators include: [22-25]
Age: Adolescents show greater vulnerability rapid neurodevelopment and peer sensitivity increase risk.
Pre-existing mental health conditions: Individuals with depression or anxiety may gravitate toward problematic use and experience worse outcomes.
Gender: Some studies show stronger effects on body image and depressive symptoms for females, though findings vary.

Type of platform and content: Visual platforms and those with short-form video algorithms differ in risk profiles compared with text-based forums.

Motives and social context: Using social media to cope with loneliness or to seek social validation predicts worse outcomes compared with using it for information or active social engagement.

Social media as an intervention platform [26-29]

In addition to its potential risks, social media offers significant opportunities as a tool for mental health promotion and intervention when appropriately designed and regulated. One of the most prominent applications is psychoeducation and public health messaging, where social media platforms enable rapid dissemination of evidence-based mental health information to large and diverse populations. Health organizations and professionals can use these platforms to increase awareness of mental health disorders, promote coping strategies, encourage help-seeking behavior, and reduce stigma. Compared with traditional communication channels, social media campaigns allow targeted messaging, interactive engagement, and real-time feedback, making them particularly effective for reaching adolescents and young adults who may be less likely to engage with conventional healthcare services.

Social media also supports the development of peer support networks, which can play a vital role in improving mental well-being. Online communities provide individuals with lived experience of mental illness a space to share personal experiences, receive emotional support, and develop a sense of belonging. Such peer-to-peer interactions can reduce feelings of isolation and normalize discussions around mental health, especially for individuals who lack strong offline support systems or face barriers to accessing care. Research indicates that participation in moderated online support groups may enhance perceived social support and empowerment while reducing stigma associated with mental illness. However, the quality of peer support is influenced by group norms, moderation, and the availability of accurate information. Furthermore, clinical and semi-clinical interventions delivered through or adjacent to social media platforms have shown promising outcomes. These include digital cognitive behavioral therapy (CBT) programs, therapist-guided interventions, crisis intervention tools, and mental health chatbots integrated into social media

environments. Clinical trials and systematic reviews suggest that such interventions can improve engagement and reduce symptoms of depression and anxiety, particularly among young users. Nonetheless, the effectiveness and safety of these interventions depend on rigorous evaluation, ethical design, and continuous moderation. Safeguards such as crisis referral pathways, professional oversight, data privacy protections, and mechanisms to address harmful content are essential to ensure that social media-based mental health interventions are both effective and safe.

Implications for pharmacy students and pharmacists

Pharmacists are among the most accessible healthcare professionals and are uniquely positioned to address emerging public health concerns related to social media use and mental health. Given their frequent contact with adolescents, young adults, and caregivers, pharmacists can play a meaningful role in early identification of social media-related mental health risks, patient education, and referral to appropriate services. Integrating awareness of digital behaviors into routine pharmacy practice aligns with the expanding scope of pharmaceutical care, which emphasizes holistic, patient-centered approaches to mental well-being.

Screening and Asking About Digital Habits

Routine screening for digital habits can help pharmacists identify patients at risk of social media-related mental health problems. Simple, non-judgmental questions about daily screen time, nighttime device use, and emotional responses to online interactions can be incorporated into medication counseling sessions or mental health check-ins. Recognizing warning signs such as sudden mood changes linked to online activity, expressions of distress or self-harm on social media, and reports of cyberbullying is particularly important in adolescent populations. Early identification enables timely referral to mental health professionals and may prevent escalation of symptoms. [30-31]

Counseling and brief interventions

Pharmacists can provide brief, evidence-based counseling to mitigate the negative mental health effects of social media use. Education on sleep hygiene—such as limiting screen exposure at least

one hour before bedtime, activating “do not disturb” modes, and avoiding device use in the bedroom—can improve sleep quality and emotional regulation. Additionally, pharmacists can encourage healthier online behaviors, including active engagement rather than passive scrolling and curating social media feeds to reduce exposure to harmful comparison or distressing content. Providing psychoeducation about trustworthy mental health resources, crisis helplines, and local counseling services further supports patients in accessing appropriate care. [32]

Medication and adherence considerations

Social media–related sleep disturbance, anxiety, and mood changes may negatively affect medication adherence and therapeutic outcomes. Pharmacists should assess sleep patterns and emotional well-being when dispensing medications, particularly psychotropic agents. Awareness of drug–sleep interactions is essential, as stimulants may exacerbate insomnia while sedative medications can impair daytime functioning if poorly timed. When counseling patients receiving antidepressants, anxiolytics, or mood stabilizers, pharmacists should inquire about social support systems and digital stressors that may influence treatment response or adherence. [33]

Advocacy and public outreach

Beyond individual patient care, pharmacists can contribute to community-level mental health promotion. Participation in school-based programs, parent education sessions, and community workshops allows pharmacists to disseminate information on safe social media use and digital well-being. Collaboration with mental health professionals, educators, and public health agencies can enhance the quality and reach of these initiatives. Pharmacists can also advocate for youth-protective policies, including age-appropriate platform design, limits on addictive features, and integration of digital-wellness education into healthcare and academic curricula. [34]

Limitations of current literature

Despite the growing body of research examining the relationship between social media use and mental health, several important limitations constrain the interpretation and generalizability of existing findings. One major limitation is the predominance of

cross-sectional study designs, which limits the ability to draw causal inferences. While many studies report associations between increased social media use and adverse mental health outcomes such as depression, anxiety, and sleep disturbance, cross-sectional data cannot determine whether social media use contributes to poor mental health or whether individuals with existing psychological distress are more likely to engage in excessive or problematic social media use. Longitudinal studies remain comparatively scarce, and although some have demonstrated bidirectional relationships, the temporal sequencing of exposure and outcome remains insufficiently understood. This limitation is particularly relevant for healthcare professionals, including pharmacists, who rely on evidence-based guidance to inform screening and counseling practices. Another significant challenge in synthesizing the literature is the heterogeneity in how social media use is defined and measured across studies. Researchers have employed a wide range of indicators, including total time spent on platforms, frequency of logins, number of platforms used, self-reported problematic or addictive use, and distinctions between active and passive engagement. These varying operational definitions complicate comparisons across studies and limit the reliability of meta-analytic conclusions. For example, time-based measures alone may fail to capture harmful patterns of use, while problematic-use scales may better reflect psychological dependence but are not uniformly applied. Inconsistent measurement tools also reduce the ability to establish standardized clinical thresholds that pharmacists and other healthcare providers could use in practice. Furthermore, the rapid evolution of social media platforms and their underlying algorithms presents an ongoing methodological challenge. Platform features, content formats, and recommendation algorithms change frequently, often faster than research cycles can accommodate. As a result, findings based on older platforms or earlier versions of current platforms may not accurately reflect present-day user experiences. Recent investigative reports and emerging studies from 2024–2025 highlight new patterns of engagement, including algorithmic amplification and the “stickiness” of mental health–related content, which may intensify exposure to distressing material or

reinforce maladaptive behaviors. These developments underscore the need for continuous research surveillance and adaptive study designs that can respond to technological changes. Without such updates, clinical and public health recommendations risk becoming outdated, limiting their effectiveness in protecting mental well-being. [35-37]

Future research directions

Future research on the relationship between social media use and mental health should prioritize longitudinal cohort studies to better establish temporal relationships and causal pathways. While existing cross-sectional evidence has identified consistent associations between social media use and adverse mental health outcomes, longitudinal designs are essential to determine whether social media exposure precedes mental health deterioration, exacerbates existing conditions, or serves as a coping mechanism for vulnerable individuals. Long-term follow-up studies across developmental stages from early adolescence into adulthood would provide critical insight into sensitive periods of risk and resilience. Such designs would also allow researchers to examine bidirectional effects and cumulative exposure over time, which are particularly relevant for informing prevention strategies and clinical guidance. Another important direction is the development and adoption of standardized and validated measurement tools for assessing social media exposure and problematic use. Current research relies on heterogeneous metrics, including self-reported screen time, frequency of use, platform count, and various problematic-use scales, which limits comparability across studies. Future work should aim to establish consensus definitions and psychometrically robust instruments that capture both quantitative and qualitative aspects of social media engagement, such as content type, emotional investment, and patterns of active versus passive use. Standardization would strengthen meta-analyses and facilitate translation of research findings into clinical screening tools usable by pharmacists and other healthcare professionals.

Research is also needed to evaluate pharmacy-delivered brief interventions targeting unhealthy or problematic social media use. Given pharmacists' accessibility and frequent patient contact, intervention trials assessing brief counseling, digital-

hygiene education, or referral-based approaches within pharmacy settings could provide valuable evidence for expanding pharmacists' role in mental health promotion. Randomized controlled trials examining feasibility, acceptability, and clinical outcomes such as improvements in sleep, mood, or medication adherence would help define best practices and inform professional guidelines. Finally, there is a pressing need for research on culturally tailored interventions and the differential impact of social media in low- and middle-income countries (LMICs). Most existing evidence originates from high-income Western nations, limiting global applicability. Cultural norms, access to technology, language, and mental health stigma can shape both social media use and its psychological effects. Future research should prioritize inclusive, cross-cultural studies and intervention designs that address local contexts and resource constraints. Such efforts are essential to ensure that mental health strategies related to social media are equitable, effective, and globally relevant. [38-40]

IV. CONCLUSION

This review highlights the multifaceted and evolving relationship between social media use and mental health, particularly among adolescents and young adults who represent the most active users of digital platforms. The evidence reviewed indicates that while social media can offer meaningful benefits such as social connection, peer support, psychoeducation, and innovative mental health interventions, excessive or problematic use is consistently associated with adverse mental health outcomes. These include increased symptoms of depression and anxiety, sleep disturbances, reduced self-esteem, loneliness, and concerning signals related to self-harm and suicidality. Importantly, the strength and direction of these associations are not uniform but are shaped by patterns of use, platform characteristics, individual vulnerability factors, and broader social and cultural contexts. The mechanisms through which social media influences mental well-being are complex and interrelated. Social comparison, exposure to idealized images, cyberbullying, fear of missing out, sleep displacement, and algorithmic amplification of emotionally charged content all contribute to psychological risk, particularly when engagement is passive, prolonged, or driven by validation-seeking

motives. Adolescents, individuals with pre-existing mental health conditions, and certain gender groups appear to be especially vulnerable, underscoring the importance of targeted prevention and early intervention strategies. At the same time, the growing use of social media as a delivery platform for mental health interventions demonstrates its potential as a scalable and accessible tool when supported by ethical design, professional oversight, and robust safety measures.

For pharmacy students and practicing pharmacists, understanding the mental health implications of social media use is increasingly essential within contemporary pharmaceutical care. Pharmacists' accessibility positions them to play a proactive role in screening for problematic digital behaviors, counseling patients on healthy social media habits and sleep hygiene, supporting medication adherence, and facilitating timely referral to mental health services. Beyond individual patient interactions, pharmacists can contribute to public health education, community outreach, and advocacy efforts aimed at promoting digital well-being and protecting vulnerable populations, particularly youth. Nevertheless, important limitations within the current literature such as reliance on cross-sectional designs, inconsistent measurement of social media exposure, and the rapid evolution of platforms and algorithms—highlight the need for ongoing, high-quality research. Future studies should emphasize longitudinal designs, standardized assessment tools, platform-specific analyses, and culturally inclusive approaches, as well as intervention trials that evaluate the feasibility of pharmacy-led strategies. Addressing these gaps will strengthen the evidence base and support the development of effective, context-sensitive guidelines.

Overall, social media should not be viewed solely as a risk factor or a remedy but rather as a powerful digital environment with the capacity to both harm and heal. A balanced, evidence-informed approach integrating research, clinical practice, education, and policy is essential to maximize benefits while minimizing risks. As the digital landscape continues to evolve, pharmacists and other healthcare professionals must remain informed, engaged, and adaptable to ensure that mental health promotion keeps pace with technological change.

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