



The Effect of Social Media on Mental, Physical, and Social Health in Adolescents

Beatrice Baum

Abstract

Social media use has become a leading public health concern because of advancements in technology and overuse of popular apps. To gain a better understanding of how social media use and its repercussions have evolved over time, this review paper will summarize research published in the last ten years, focusing on negative effects on physical, mental, and psychosocial health. The primary goal of this review is to provide a better understanding of the breadth of consequences concerning social media usage including sleep quality, cyberbullying, loneliness, body image, eating disorders, and anxiety. Additionally, it will seek to provide a variety of solutions that aim to lessen harmful effects of social media and give advice to help adolescents navigate the digital world without detrimental effects to their health.

Introduction

95% of teens report having access to a smartphone, and 45% of teens now say they are online on a near-constant basis (Anderson and Jiang, 2018). Adolescents have become early and enthusiastic users of social media, with the average screen time of older adolescents (aged 13-18) being around 6.67 hours per day (Odgers & Jensen, 2020). Social media is any online platform people use to generate content and share opinions, experiences, or insights with each other (Engel et al, 2023). Ever since the advent of social media, it has been a major source of interest among people of all ages and users have been amazed and impressed at its capabilities. However, the excitement over these new advancements may have overshadowed a growing concern for adolescent wellbeing. In the last 25 years, rates of depression have increased by nearly 70% (Keles et al, 2020) amongst adolescents and suicidal rates have tripled (Odgers & Jensen, 2020). Adolescents have started spending less time around family, friends, and nature, and have spent more time scrolling through social media. These sudden and steep increases and dramatic lifestyle changes, such as increased sedentary behaviour, reduced attention span, altered sleep patterns, and declined face-to-face interactions are concerning. Researchers have been investigating whether there is a connection between growing social media usage, mental and physical health decline, and social disconnection in adolescents.

Adolescence is defined by The World Health Organization (WHO) as the developmental period between ages 10-19 when adolescents go through major biological changes and social role transitions (Sawyer et al, 2018). During this period, adolescents grow, mature, and develop opinions influenced by the people around them, including parents, friends, teachers, and social media. Going through so many changes emotionally makes adolescents especially vulnerable to problems like anxiety or depression. Because of the widespread social media use [at least 92% of adolescents are active on social media (Keles et al, 2020)] and the high percentage of adolescents that end up affected by social media, adolescents have become the focus point of research on social media's harms.

While research on social media is abundant, few papers provide a review and ideas for interventions to lessen the harmful effects and promote social media literacy. Social media use is becoming more pervasive, so it is imperative to continue to share research that can educate parents and adolescents on appropriate and healthy social media use. This review paper will summarize what appears to be the most common areas impacted by social media use and,

importantly, will summarize the current suggested interventions for mitigating these rising concerns.

Methods

Google Scholar and PubMed were used to obtain a large variety of quality articles. Only papers published in 2010 or later were included to ensure a relevant review. Additionally, only papers that were written about the period of adolescence were eligible to be included. Only review or meta-analysis papers were used to provide a broader selection. However, out of many articles published, only 15 were used in this review to maintain a focused and relevant review.

This review paper categorizes the effects of social media into 3 categories: mental, physical, and social. It is important to note that these issues often influence and build upon one another, and this interconnection will be emphasized whenever possible. For example, developing anxiety could lead to an eating disorder, which could lead to physical health problems, which could lead to depression, which could lead to suicidal ideation (Kalaf et al, 2023). It is important to understand the individual impacts of social media on physical, cognitive, and mental health as well as the intersecting impacts because when they intersect, the effects are often more detrimental.

1. Mental Health

Mental health is a state of wellbeing that enables people to cope with stress, learn and work well and contribute to their community (Odgers and Jensen, 2020). When mental health is declining, adolescents can feel depression or have anxiety. Mental health tends to worsen during adolescence because of emotional, physical, and social changes, academic pressure, and new responsibilities. Mental health is the most widely researched when it comes to social media's effects. This section of the results aims to educate on how the use of social media can negatively impact adolescents' mental health, and what the results are.

1.1 Anxiety

Anxiety disorders are the most prevalent psychiatric condition in teenagers living in the US (Prasad et al, 2023), and the rates of anxiety are only growing, with the amount of younger people experiencing anxiety increasing by 70% in the last 25 years (Keles et al, 2020). The timing of this growth aligns with the adaption and usage increase of social media, leading researchers to suspect that these events could correlate. Anxiety is characterized by excessive and persistent fear about everyday situations. As adolescents mature it is common for increases in anxiety to occur due to academic pressure, social pressure, and now, excessive social media use. Anxiety can manifest in many different ways when social media is involved. First, is online multitasking. When adolescents are on social media, they often access multiple apps at the same time and jump between conversations (Prasad et al, 2023). This feeling of having many things going on at the same time is associated with higher anxiety rates (Prasad et al, 2023).

Anxiety can also occur when comparison with others online happens. Online comparison is common on social media due to the unrealistic promotions of beauty and success. Online comparison leads to anxiety as adolescents wonder why their bodies or lives don't compare to the heavily edited ones shown on social media (Prasad et al, 2023). Additionally, the common behavior, especially in adolescent girls, of posting selfies is correlated with increases in anxiety (Choukas-Bradley et al, 2022). After posting on social media, teenage girls worry about what people will think about their looks. When posts aren't "liked", or when comments are left on them, adolescents feel lower self-confidence (Choukas-Bradley et al, 2022). Overall, social

media greatly contributes to anxiety in adolescents in many different ways. Anxiety creates tension in adolescents' relationships as they often feel sad and don't want to socialize, makes completing daily tasks stressful, and could lead to less academic and extracurricular success.

1.2 Depression

The prevalence of a depressive disorder in the world is estimated at 38.7 million, and the numbers are only rising (Prasad et al, 2023). Adolescents are already very susceptible to depression, with 1 in 5 adolescents aged 13-15 developing a serious mental illness (Borzekowski, 2022). Depression is already common in adolescents, and social media only creates a greater risk. Depression is defined as persistent feelings of sadness and lack of interest. Depression can appear in many different severities, ranging from disinterest in enjoyable activities to life threatening and dangerous. Like with anxiety, depression is usually indirectly caused by social media, meaning that other results of social media use can lead to depression.

Additionally, when adolescents spend a lot of time on a phone viewing social media, they can start to pull away from everyday activities and become isolated and lonely (Odgers & Jensen, 2020). Loss of physical activity can lead to mental health decline as well. Overall, self-esteem, physical activity, eating behaviors, and depression are strongly correlated with one another, and social media can heighten the risk of depression. (Suhag & Rauniyar, 2024).

1.3 Suicidal Thoughts

Suicidal rates are increasing in all age groups, but especially in adolescent girls, where suicidal rates have tripled from 1999 through 2017 (Odgers & Jensen, 2020). Suicide is defined as the act of killing oneself intentionally. As with depression and anxiety, suicide rates have increased alongside social media use and appeared more among adolescents, who are heavy users of social media. Adolescents can be introduced to the idea of suicide through social media, and some may choose to film or document their own suicidal attempt (Prasad et al, 2023). A popular game on social media called the Blue Whale Challenge encouraged adolescents to attempt suicide and ended up manipulating hundreds of teenagers around the world (Prasad et al, 2023). Adolescents entered the challenge, and many live-streamed suicides, whether completed or failed (Prasad et al, 2023). Things like this are proof that social media has become a tool to normalize suicide, with few influencers attempting to stop its normalization by posting content discouraging adolescents from committing suicide (Suhag & Rauniyar, 2024). Suicide is commonly caused by extreme sadness, loss of self-worth or purpose, and sometimes depression or anxiety. Suicide correlated with social media could be caused by a variety of factors, including depression, anxiety, body image issues, eating disorders, and cyberbullying. After attempting, adolescents can fall back into the same pattern of sadness, and some continue to try, which makes it especially dangerous.

1.4 Eating Disorders

An eating disorder is defined as a behavioral condition categorized by severe and persistent disturbances in eating behaviors and associated distressing thoughts and emotions. Nearly half of adolescent girls engage in disordered eating (Choukas-Bradley et al, 2022), but only 10% of teenage girls have diagnosed eating disorders (Suhag & Rauniyar, 2024). They appear in many different ways, and some are more extreme than others, which makes it hard to discern healthy dieting from an eating disorder. The most common include bulimia nervosa, anorexia nervosa, or binge eating. Eating disorders are more common in adolescent girls than boys because girls feel more pressure to fit a certain appearance standard. (Engel et al, 2023) Social media influencers encourage disordered eating by supporting things such as

pro-anorexia and thinpiration, which inspire adolescents to restrict food intake and support extreme weight loss (Suhag & Rauniyar, 2024). Eating disorders are shown as healthy and common when in reality, they contribute to long-term physical issues and result in other mental health problems. Other impacts of eating disorders include cardiac arrhythmia, amenorrhea, bradycardia, weakening of the heart muscle, esophagitis, and esophageal or gastric rupture (Suhag & Rauniyar, 2024). Recovery from eating disorders is nearly impossible, and most adolescents can't return to a healthy weight in the years following recovery.

1.5 Body Image

A survey of adolescents in the US reports that 81% of adolescent girls and 50-67% percent of teenage boys feel bad about their bodies in some way (Choukas-Bradley et al, 2022). These findings are consistent with other papers regarding the fact that more teenage girls feel bad about themselves. Gender variations vary due to the norms of Western civilization. These include the excessive pursuit of thinness, investment in one's appearance, and how others perceive them (Choukas-Bradley et al, 2022). These body image issues can be influenced by the content posted on social media that promotes a certain body ideal, and encourages adolescents to lose weight or to diet/workout to fit these standards. Adolescents are especially susceptible to this because they are already going through many physical changes that make them vulnerable (Suhag & Rauniyar, 2024). Another cause of insecurity is heavily editing photos to emphasize an ideal body type. Online influencers use editing software that adds filters, shrinks or enlarges body parts, or changes hair or eye color (Engel et al, 2023). This leaves adolescents wishing they could look a certain way that could be nearly impossible or unrealistic. Finally, body positivity content is rare on social media, and scrolling through social media usually makes adolescents feel worse about themselves (Engel et al, 2023). Influences who don't use filters or encourage adolescents to love and accept themselves are rare and less popular (Engel et al, 2023) .

2. Physical Health

Physical Health is defined as the body's normal functioning, including organ health, sleep, exercise, hygiene, and nutrition. Physical health is especially important during adolescence because it helps support the many developmental changes that adolescents go through. Social media can influence many aspects of physical health.

2.1 Sleep

In 2014, sleep was recognized by AMA and the AASM as a serious health risk (Owens, 2014). Insufficient sleep can result in poor decision-making skills, mood disorders, increased alcohol and drug use, lower academic success, and a higher number of car wrecks (Owens, 2014). When sleep time is under a total of 4 hours, a greater risk for suicidality has been reported. As adolescents get older, their sleep times decrease. A decrease in sleep time is caused by more after-school employment, academic stress, and extracurriculars, but adolescents tend to use social media more as they get older. A poll of adolescents in the US found that 30-41% of 6th-8th graders reported getting 9 or more hours of sleep, but only 3% of 12th graders reported doing so (Owens, 2014). Social media displaces sleep time and can cause sleep-disrupting mental and emotional arousal. Adolescents use social media before they sleep and even wake up during the night to check social media. 36% of adolescents report waking up at least once throughout the night to interact with social media (Khalaf et al, 2023). Adolescents are also kept up at night by the content of what they see on SM. Time before sleep should be relaxing, but SM continues stimulating the brain, making it harder to fall asleep, and impacting sleep quality (Pagano et al, 2023).

who have trouble falling asleep because they are on social media usually turn to social media as a sleep aid (Pagano et al, 2023). Sleep quality and quantity is very important for adolescents as their bodies need time to relax and refresh to keep up with more challenging academics and stress. When social media displaces this time, the results are detrimental and even deadly.

2.2 Physical Activity

Another concern of social media is an increase in sedentary behavior. Physical activity is healthier for both the body and the mind, however, social media use displaces it and could result in weight gain, sleep disturbances, cardiovascular issues, or lower mental health (Keles et al, 2020). In a sample of Kuwaiti adolescents, less than 4% reported getting greater than or equal to the recommended amount of physical activity (60 minutes) (Borzekowski, 2022). This percentage is similar to that of the US and other countries. Social media has only encouraged sedentary behavior since most adolescents view it while sitting or lying down.

3. Social Disconnection

Social Disconnection is the feeling of isolation and the lack of meaningful connection within social relationships. Social media displaces time to connect with people in person and strengthen those relationships, leading to feelings of isolation and disconnection.

3.1 Socialization

Socialization on social media differs greatly from face-to-face interactions because they are often shorter and less fulfilling (Smith et al, 2021). Smith & colleagues (2021) introduced the “social displacement model,” which said that time on social media displaced time dedicated to in-person interactions, thereby lessening the strength of those connections. Adolescents need strong social support, especially as they navigate hard things in school and socially, yet social media weakens bonds and lessens social support.

3.2 Cyberbullying

18% of 13 year olds have experienced cyberbullying, and the numbers rise as adolescents get older (Ademiluyi et al, 2022). Cyberbullying is defined as willful and repeated harm through the use of computers, cell phones, or other electronic devices (Englander, 2017). Cyberbullying can appear in many different forms; the most common are flaming, when a person sends angry messages; harassment, constant stream of angry messages; denigration, angry messages about the target are forwarded to the target’s friends; masquerading, when the target’s identity is stolen to imitate harmful messages produced by the bully; trickery, when the victim is tricked into showing personal information; exclusion, when a target is ostracized from a social group; stalking, hacking or obtaining the targets personal information to determine their location; and blackmailing, anonymous messages are sent to a target to solicit actions from them (Ademiluyi et al, 2022). When social media is used as a tool to cyberbully, adolescents can develop depression, psychological distress, suicidal thoughts, and substance use (Ademiluyi et al, 2022). Girls are much more likely to be cyberbullied and in a study by Selkie and colleagues 2016, 44% of college-aged girls reported being cyberbullied at some point.

The causes of cyberbullying are diverse, but several studies have found connections between adolescents who tend to become cyberbullies. First, are environmental factors, including income, gender, and community. Students with either of these characteristics are more likely to become perpetrators, because early-childhood interactions and social development can be limited when some activities are prevented by a payment gap (Ademiluyi et al, 2022). Weak emotional bonds with parents are also common in perpetrators. Those more likely to be victimized share a lot of information online, have little understanding of the importance of

personal security, and spend more time online than others. Additionally, those with a prior history of victimization were more likely to be targeted again (Odgers and Jensen, 2020)

3.3 Loneliness

Recent surveys conducted amongst youth in the US, Australia, and the UK indicated that around $\frac{1}{3}$ of youth feel lonely, and more than 20% feel lonely often or always (Smith et al, 2021). An increased screen time was also proven to result in greater loneliness. Research shows that adolescents feel lonely when they perceive their relationships as less than desired, which can happen often on social media (Smith et al, 2021). Because of multitasking online, conversations aren't as deep and adolescents can feel like effort is not being put into the connection, which leads to loneliness. Loneliness is one of the major causes of suicidal thoughts because of the feeling of loss of connection.

Discussion

In summary, the effects of social media on adolescents' mental, physical, and social health are vast and can vary depending on adolescents' screen time and other habits. However, the overarching theme of the research reviewed in the paper shows that when adolescents spend a prolonged amount of time either viewing or interacting with social media, they are vulnerable to mental health issues (i.e., depression or anxiety), physical health issues (i.e., sleep), and social disconnection (e.g., loneliness). As social media is becoming increasingly prevalent in society, especially amongst adolescents, it is important to understand its negative aspects in order to use it more responsibly.

The most commonly recognized effects of social media are mental health disorders like anxiety, depression, or eating problems. Mental health is also the broadest category. Research shows that because of the amount of peer approval on social media, whether in messaging others or posting content, adolescents can feel "less-than" and develop issues with mental health (Choukas-Bradley et al, 2022). Mental health is also heavily affected by the amount of edited photos online that show adolescents unrealistic body standards and cause them to feel sad or even depressed about how they look (Prasad et al, 2023). Physical health is another aspect of adolescent health that is commonly researched and is affected by social media. Social media affects physical health in two main categories: sleep and physical activity. Both categories also have a recurring theme of displacement. Using social media at night displaces sleep time (Khalaf et al, 2023), leading to greater exhaustion during the day, and it also displaces time that adolescents exercise or aren't sedentary (Keles et al, 2020). Social disconnection and cyberbullying are the last impacts of social media reviewed in this paper. Social disconnection is one of the least commonly researched effects; however it is especially important for adolescents. As adolescents go through more challenging social and academic things, they need stronger social support and connection, which social media can take away from (Smith et al, 2021) by replacing time spent in-person with friends and family. Cyberbullying is one of the most heavily researched effects of social media, and it is also the most common amongst adolescents, with an average of 20% of adolescents experiencing cyberbullying from the ages of 13-16 (Ademiluyi et al, 2022).

While this paper focuses on the negative effects of social media it is also important to recognize that, when used responsibly, it can be helpful and positively influence. Prior research suggests that social media can have a positive influence on social connection, digital media literacy, self expression, and learning new things (Haddock et al, 2022). Regarding social connection benefits, the most prominent example in research of this involves how social media can help reduce feelings of loneliness. A paper by Smith & colleagues (2021) introduces the

Social Compensation Model, which says that adolescents may feel less lonely when on social media because they feel it is a safer space to form connections. Although this contrasts with other papers summarized in this review that say that social media can cause loneliness, evidence suggests that social media can have a positive impact when one or more factors are present. For example, certain personality traits like being introverted may cause individuals to be hesitant to approach people or build relationships in person; however, when online, they are more likely to reach out (Smith et al, 2021). The positive effects of social media do not just exist within social contexts. Prior research demonstrates that social media can enhance many parts of adolescents' lives, but it is always emphasized that the positive effects depend on key factors and whether someone follows healthy practices while engaging.

When thinking about how to mitigate the negative effects of social media, there are a couple of different solutions that seem helpful when considering all the other parts of adolescent health that are affected by social media. Given that social media is especially detrimental when used over a prolonged time period (two hours was found to lead to physiological distress), if adolescents can limit themselves to a certain amount of time on social media (i.e., less than two hours per day), they may be able to mitigate the negative effects caused by overuse and experience the benefits (Keles et al, 2020). Additionally, it is especially important to be educated on how to use social media safely and the possible effects of overusing it or using it irresponsibly. When thinking specifically about mental health, blocking or reporting dangerous content or people, and stopping social media use when adolescents start feeling sad, anxious, or have suicidal ideations can be especially helpful. Ideas to help reduce the effects of social media on physical health involve avoiding content that adolescents feel could be harmful or not positive. Since many struggles with body image and social media originate from the content viewed (i.e., addressing ways to help adolescents fit the beauty standard more), it is especially important and helpful to choose the content viewed based on whether it makes adolescents feel bad about themselves.

Although this paper has many strengths including having a variety of documents summarized, some of which highlight understudied areas, and outlining ideas on how to mitigate social media's effects, there are some limitations to note. Given the amount of literature involving the negative impacts of social media on adolescent health, the number of papers selected that aligned with the scope of the current review's research question had to be limited. To account for this, only review papers were chosen to capture as much research as possible. However, much of the research did not explore the long-term effects of social media on adolescent health, so it will be important for future studies to investigate this. Some long-term effects that are important to research include sleep, eating disorder recovery, and mental health given that some studies highlight these effects as being harder to recover from. In addition, most of the summarized papers included adolescents who identify as White, living in the US, and who likely align with US cultural norms regarding social media use. In addition to a lack of diversity regarding race and ethnicity, this review did not explore possible differences between social media and adolescent mental health due to several other demographic or social factors, including but not limited to age, gender, personality, school type, and strength of relationships between family and friends at home or school. As a result, the studies included in this review may not generalize to more diverse groups of adolescents. Therefore, future research considering these diverse factors may help reveal solutions that may be more helpful to different groups of people.

In summary, this review highlights that social media affects three main areas of

adolescent health, mental, physical, and social. As social media becomes increasingly prominent in people's lives, it is important to understand how it can be used responsibly. By following these responsible practices, it is possible that social media can serve as a positive and joyful platform for social engagement, reducing the negative impact it can have on adolescents.

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