



LITERATURE REVIEW

Empowering Adolescents in the Digital Era: A Comprehensive Approach to Digital Well-being

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Abstract: The rapid proliferation of digital technologies has profoundly impacted adolescents, presenting both opportunities and challenges to their well-being. This study explores the concept of digital well-being among adolescents, focusing on the multidimensional nature of digital satisfaction, safe and responsible behavior, and overall digital health. Through a comprehensive review of existing literature, this research identifies key factors influencing digital well-being, such as gender differences, socioeconomic status (SES), and cultural background. The findings suggest that effective interventions must be tailored to account for these contextual factors. Cognitive-behavioral therapy (CBT) and family-based interventions are highlighted as promising strategies, though their success may vary depending on cultural perceptions of digital technology and mental health. Additionally, the study underscores the importance of digital literacy as a protective factor, particularly for girls and low-SES adolescents who are more vulnerable to negative digital experiences. This research contributes to the growing body of knowledge on digital well-being by integrating these diverse factors into a cohesive framework. The practical implications for psychologists, educators, and policymakers are significant, offering actionable insights for developing targeted interventions to support adolescents in navigating the digital age. Further research is recommended to explore the nuanced effects of active versus passive technology use and to assess the effectiveness of various interventions across different cultural contexts.

Keywords: Digital Well-being, Adolescents, Digital Literacy, Cognitive-behavioral Therapy (CBT), Socioeconomic Status (SES)

INTRODUCTION

Digital well-being is an increasingly important concept in the modern era, where the pervasive use of digital technology significantly impacts individuals' mental, physical, social, and emotional health. As adolescents are spending more time interacting with digital screens, including smartphones, computers, and tablets, understanding the effects of this engagement is crucial (Vanden Abeele & Nguyen, 2022). The concept of digital well-being focuses on both the benefits and burdens of mobile connectivity on individuals' overall well-being. However, excessive screen time, mobile addiction, and the negative impacts of social media present substantial challenges, leading to distractions, sleep disruption, and potential adverse effects on mental health, such as increased social isolation, depression, and cyberbullying (Odgers & Jensen, 2020).

The emotional features embedded within social media platforms can significantly influence users' emotional states and overall digital well-being. Extensive use of social

media has been linked to various issues such as mobile addiction, feelings of social isolation, and even addiction to social media platforms themselves (Khan, 2020). Moreover, digital stress is prevalent among young people today, particularly during adolescence, when stress is at its height (Bora & Neelakandan, 2023). Adolescence is a critical period where individuals are particularly vulnerable to the effects of digital technology. The complexity of digital well-being in adolescence is influenced by various factors, including the type of technology use, the individual's vulnerability, and the presence of pre-existing psychological conditions (Dienlin & Johannes, 2020).

In an effort to better understand and manage the impacts of digital technology on adolescents, this research adopts the model of digital well-being proposed by Vanden Abeele (2021). This model emphasizes achieving an optimal balance between the benefits and drawbacks of digital connectivity in daily life. According to Dienlin and Johannes (2020), the use of digital technology has a more substantial impact on short-term hedonic well-being, characterized by negative affect, compared to long-term eudaimonic well-being, such as life satisfaction. This research extends the understanding of digital well-being by exploring how different modes of technology use, whether active or passive, affect adolescents' mental health (Clark et al., 2016).

Defining digital well-being is essential to address its multifaceted nature. Vanden Abeele (2021) describes digital well-being as a state of subjective well-being

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achieved through an optimal balance between the benefits and drawbacks of digital connectivity. Bora and Neelakandan (2023) highlight that digital well-being involves understanding and managing the positive and negative effects of digital activities to improve overall well-being. Additionally, Ambike et al. (2023) defines digital well-being as a state of optimal physical, mental, and emotional health in one's use of digital technologies and online platforms. This balance is crucial to promoting positive digital habits and minimizing the negative impact of excessive screen time and digital addiction (Thomas et al., 2022).

The hyperconnected digital world influences how individuals perceive themselves and form their identities, emphasizing the need for balance and competence in navigating complex digital environments (Khan, 2020). Achieving digital well-being involves using technology to limit screen time, promote healthy lifestyles, and enhance productivity through the use of apps and healthy practices. As Thomas et al. (2022) state, digital well-being is about ensuring one's mental and physical health in a world dominated by digital abundance.

Given the global concern over the adverse effects of social media on psychological well-being, it is crucial to approach generalizations cautiously, considering the diversity of populations and cultures involved. In the current digital era, adolescents are increasingly exposed to various social media platforms that can significantly influence their overall well-being. However, there is still a need for a deeper understanding of how digital well-being manifests among adolescents who use social media. This research aims to explore existing literature to gain insights into the components of digital well-being and recognize the diversity across different genders, socioeconomic statuses (SES), and cultures.

This study not only provides theoretical insights into digital well-being among adolescents but also offers practical recommendations for parents, educators, and policymakers in developing interventions to enhance digital well-being. By understanding the components and factors influencing digital well-being, this research is expected to serve as a foundation for future studies and contribute to the existing literature. The findings could be instrumental in shaping more effective strategies and policies to support adolescents' digital well-being across various social and cultural contexts.

METHODS

Research Design

This study employed a semi-structured literature review method, which is an approach that allows researchers to identify gaps in the existing literature and describe the factors influencing digital well-being among adolescents. This method was chosen for its flexibility in conducting an in-depth review of the literature while maintaining a clear structure in the data collection and analysis process (Ridley, 2012). This approach is particularly relevant for exploring emerging topics such as digital well-being, which requires a holistic and integrated understanding from various research perspectives.

Data Collection Procedure

Data were collected through searches in various credible academic databases, including Lens, Dimensions,

and Google Scholar. The search was conducted using specific keywords such as "digital well-being" and "digital well-being among adolescents." This step aimed to identify studies relevant to the topic of digital well-being among adolescents published within the last 10 years. The data collection process involved extensive searching to ensure that all significant literature was covered and that the findings generated were comprehensive and up-to-date.

Inclusion and Exclusion Criteria

After the initial search, the identified articles were screened based on strict inclusion and exclusion criteria. The inclusion criteria comprised studies published within the last 10 years, with a research focus on digital well-being, and that used adolescents as research subjects. Articles that did not meet these criteria, such as those lacking full-text access or not relevant to the main research focus, were excluded from further analysis. This step is crucial to ensure that only the most relevant and high-quality literature is included in the review.

Data Analysis

Following the article selection stage, the findings from the selected studies were analyzed using thematic synthesis techniques. Each article was thoroughly reviewed to identify key themes related to digital well-being, such as gender differences, socioeconomic status (SES), and culture. The analysis results were then categorized and synthesized to provide a comprehensive overview of digital well-being among adolescents. This technique allows for the systematic integration of various findings, resulting in deeper insights into the factors influencing digital well-being in the adolescent population.

RESULTS

Digital Well-being

In reviewing the literature, various perspectives on digital well-being were identified. Researchers have focused on different aspects, such as digital engagement with mental health (Gracia et al., 2024), screen time and well-being (Thomas et al., 2022), digital health (Munthe et al., 2021), and digital media use (Svensson et al., 2022). However, research specifically addressing psychological aspects of digital well-being remains limited (Arslankara et al., 2022; Ali, 2023; Ambike et al., 2023; Hanebutt, 2023; Büchi, 2024). Vanden Abeele (2021) proposed a theoretical model that conceptualizes digital well-being as a dynamic state of optimal balance between the benefits and drawbacks of mobile connectivity. This model emphasizes both affective and cognitive appraisals of digital integration into everyday life.

Digital Well-being in Gender Differences

The review revealed significant gender differences in digital well-being, particularly among adolescents. Data from UNICEF (2023) shows that girls tend to have lower digital skills compared to boys, but they often demonstrate higher levels of digital literacy (Munthe et al., 2021). Additionally, girls are more prone to experiencing psychological problems related to digital engagement, including risks such as cyberstalking and online harassment (OECD, 2018). Longitudinal studies have

indicated that girls experience higher psychological distress as their digital device usage increases compared to boys (Jayman et al., 2023).

Digital Well-being in SES Differences

Socioeconomic status (SES) also plays a crucial role in adolescents' digital well-being. Low-SES adolescents are more likely to experience psychological problems due to increased digital engagement than their high-SES counterparts (Jayman et al., 2023). The impact of digital engagement on well-being varies across different countries, with low-SES adolescents in some regions being more adversely affected (Gracia et al., 2024).

Digital Well-being in Cultural Differences

Culture significantly influences digital well-being, particularly in the context of parenting and social relationships. Warm parenting and active communication between parents and children are associated with healthier digital practices, reducing the likelihood of gadget addiction (Ding & Li, 2023). Conversely, neglectful parenting can lead to excessive gadget use and associated behavioral problems. Cultural factors also shape how adolescents engage with digital media and perceive their digital experiences.

Impact of Digital Usage

Digital technology impacts various aspects of adolescent well-being. While some studies highlight the positive effects of digital tools on social relationships (žanić et al, 2023), others point to the potential for social media to contribute to feelings of loneliness, envy, and depression, particularly when used passively (Clark et al., 2016; Ostic et al., 2021). Excessive social media use is linked to several negative outcomes, including mobile addiction and social isolation (Bora & Neelakandan, 2023).

DISCUSSION

The discussion section should be aligned closely with the theoretical framework established in the introduction, particularly the model of digital well-being proposed by Vanden Abeele (2021). This model conceptualizes digital well-being as a dynamic state of balance between the benefits and drawbacks of mobile connectivity. The findings of this study provide both support and new insights into this theoretical model, highlighting how digital well-being is experienced by adolescents across different contexts.

Linking Findings to Theoretical Framework

The findings of this study provide strong empirical support for Vanden Abeele's (2021) model of digital well-being, which posits that maintaining an optimal balance in digital connectivity is crucial for preserving subjective well-being. This model suggests that digital well-being is not solely about mitigating the negative consequences of digital use, such as technostress—a form of stress induced by the overuse or misuse of technology—or mobile addiction, which refers to an excessive reliance on mobile devices that can interfere with daily life. Rather, digital well-being also encompasses the enhancement of positive experiences that contribute to an individual's overall

satisfaction and sense of self-fulfillment in the digital age (Ali, 2023).

The concept of technostress is increasingly relevant in our hyper-connected world. As highlighted by Vanden Abeele (2021), technostress occurs when there is a lack of balance between the demands of digital connectivity and an individual's ability to cope with these demands. It can lead to feelings of anxiety, frustration, and fatigue, particularly when digital interactions are overwhelming or when there is an inability to disconnect from digital devices. The findings from the literature suggest that technostress is a significant concern among adolescents, who often struggle to manage their digital interactions in ways that do not detract from their well-being (Dienlin & Johannes, 2020). This aligns with the theoretical framework that emphasizes the need for a balanced approach to digital connectivity.

Mobile addiction is another critical aspect of digital well-being that has been extensively documented in the literature. According to Ali (2023), mobile addiction is characterized by an uncontrollable urge to use mobile devices, which can lead to negative outcomes such as social isolation, sleep disturbances, and decreased academic performance. The evidence from this review supports the model by showing that interventions aimed at reducing mobile addiction, such as digital detox programs, can significantly enhance digital well-being by restoring balance and promoting healthier digital habits.

Beyond mitigating negative impacts, the findings highlight the importance of enhancing positive digital experiences, which are central to Vanden Abeele's (2021) model. Digital satisfaction, as defined by Arslankara et al. (2022), refers to the pleasure and positive emotions that individuals derive from their digital interactions. This satisfaction is crucial for maintaining digital well-being, as it reflects the harmonious integration of digital technologies into everyday life. For instance, engaging in meaningful online activities, such as educational pursuits or connecting with like-minded communities, can foster a sense of accomplishment and fulfillment, thereby contributing to higher levels of digital well-being (Büchi, 2024).

Self-actualization, another key component of digital well-being, involves using digital tools and platforms in ways that promote personal growth and the realization of one's potential. Vanden Abeele (2021) emphasizes that digital technologies should not only be viewed as tools for communication or entertainment but also as platforms for self-expression and personal development. The findings suggest that when adolescents use digital media to pursue their interests and develop new skills, they experience greater digital satisfaction and a stronger sense of purpose. This aligns with Maslow's hierarchy of needs, where self-actualization is the pinnacle of psychological development, indicating that digital well-being is deeply intertwined with broader psychological theories of human motivation and fulfillment (Vanden Abeele, 2021).

The findings related to gender differences in digital well-being further illustrate the applicability of Vanden Abeele's (2021) model. Despite facing higher risks of online harassment and psychological distress, which are significant barriers to achieving digital well-being, girls often demonstrate higher levels of digital literacy compared to boys (Munthe et al., 2021). Digital literacy refers to the skills and knowledge required to effectively navigate and use digital technologies, and it is a critical factor in managing digital engagement in a healthy and productive manner (UNICEF, 2023). Higher digital literacy among girls enables them to better cope with the

challenges of the digital environment, potentially mitigating some of the negative effects associated with increased digital engagement.

This finding underscores the importance of digital literacy as a protective factor that enhances digital well-being, particularly for vulnerable groups. It also suggests that interventions aimed at improving digital literacy could play a vital role in promoting digital well-being, especially for populations at higher risk of experiencing negative digital outcomes. The ability to critically assess online content, engage in safe and responsible behavior, and utilize digital tools for personal and educational growth are all aspects of digital literacy that contribute to a balanced and healthy digital life (Munthe et al., 2021; Vanden Abeele, 2021).

Digital Satisfaction, Safe and Responsible Behavior, and Digital Wellness

In the realm of digital well-being, it is crucial to clearly define and consistently use key concepts such as 'digital satisfaction,' 'safe and responsible behavior,' and 'digital wellness.' These concepts provide a comprehensive framework for understanding the multifaceted nature of digital well-being and the factors that contribute to it.

Digital satisfaction refers to the pleasure, contentment, and positive feelings that individuals derive from their interactions with digital technologies. It encompasses the subjective well-being that comes from engaging with digital content and platforms in ways that are personally fulfilling and enjoyable. Arslankara et al. (2022) describe digital satisfaction as the harmony and positive emotions that users experience when their digital interactions meet their expectations and needs. This concept is integral to digital well-being as it highlights the importance of positive digital experiences, which can enhance overall life satisfaction. For instance, engaging in online communities that align with personal interests or using digital tools to achieve goals can significantly contribute to a sense of digital satisfaction, thereby supporting a balanced and healthy digital life.

Safe and responsible behavior in the digital context refers to the appropriate and ethical use of digital technologies. It involves making informed choices that ensure safety and respect for oneself and others while navigating digital environments. According to Arslankara et al. (2022), this concept emphasizes the correct and meaningful use of digital tools, which includes practices such as protecting personal information, avoiding harmful content, and being mindful of the impact of one's online actions on others. Safe and responsible behavior is crucial for maintaining digital well-being, as it mitigates risks such as cyberbullying, identity theft, and exposure to inappropriate content. By promoting safe and responsible digital practices, individuals can enjoy the benefits of digital technologies without compromising their safety or the well-being of others.

Digital wellness is the overall state of being healthy and content in one's use of digital technologies. It goes beyond mere avoidance of negative digital experiences to encompass a proactive approach to integrating digital environments into daily life in ways that enhance well-being. Arslankara et al. (2022) define digital wellness as a state of feeling healthier and happier as a result of positive interactions with digital tools and environments. This concept includes not only the physical aspects of health, such as preventing eye strain and ensuring proper ergonomics, but also the mental and emotional dimensions, such as managing screen time to avoid digital

fatigue and ensuring that digital engagement contributes positively to one's emotional state. Digital wellness is achieved when individuals can use digital technologies in a way that supports their overall health, happiness, and life satisfaction.

Integrating Perspectives on Gender, SES, and Culture

Understanding how factors such as gender, socioeconomic status (SES), and culture influence digital well-being is essential for developing targeted interventions that address the diverse needs of adolescent populations.

Gender plays a significant role in digital well-being, with research indicating that girls face unique challenges in the digital space. For example, Jayman et al. (2023) found that girls are more likely to experience psychological problems due to increased digital engagement, including risks such as online harassment and cyberbullying. Despite these challenges, girls often demonstrate higher digital literacy than boys, which can help them navigate the digital environment more effectively (Munthe et al., 2021). This duality underscores the need for gender-specific interventions that address the particular vulnerabilities and strengths of girls in the digital world. For instance, programs that enhance digital literacy while also providing support for managing the psychological impacts of digital engagement could be particularly beneficial for girls.

SES is another critical factor influencing digital well-being. Adolescents from low-SES backgrounds are more susceptible to the negative effects of digital engagement, such as increased exposure to harmful content and reduced access to positive digital experiences. Gracia et al. (2024) highlight that low-SES adolescents are at a higher risk of experiencing psychological problems due to their digital interactions. This finding supports the need for targeted interventions that provide these adolescents with the resources and support they need to engage with digital technologies in a way that promotes their well-being. For example, initiatives that improve access to digital literacy programs and safe online spaces could help mitigate the negative impacts of digital engagement for low-SES adolescents.

Culture significantly shapes how adolescents experience digital well-being, particularly through the lens of parenting styles and social relationships. Ding and Li (2023) emphasize that warm, communicative parenting is crucial for reducing the risks associated with excessive gadget use. In cultures where family cohesion and strong parental involvement are valued, these practices can play a protective role in adolescents' digital lives. Conversely, in cultures where digital engagement is less regulated by parental guidance, adolescents may be more vulnerable to the negative aspects of digital interaction. These cultural differences suggest that interventions to promote digital well-being must be culturally sensitive and tailored to the specific needs and values of different populations. For example, in societies that prioritize family cohesion, interventions that involve parents in their children's digital education may be particularly effective.

The Impact of Digital Usage

Digital technology impacts various aspects of society. Studies show that digital tools can positively influence social relationships (Žanić et al., 2023). The frequency of using digital technology does not negatively impact the sense of community; in fact, the use of mobile phones is positively correlated with support and emotional

connection with peers (žanić et al, 2023). According to Dienlin and Johannes (2020), 31% of US adolescents believe that the effects of social media are mostly positive and another 24% of adolescents believe that the effects of social media are mostly negative. Teens who considered the positive effects stated that social media helps them to connect with friends, obtain information, and find like-minded people. Those who considered the negative effects explained that social media can increase the risks of bullying, neglecting face-to-face contact, and obtaining unrealistic impressions of other people's lives.

Furthermore, based on literature by Clark et al., (2016) it was found that the use of social media has an impact of loneliness on users who passively view social media content, as social media platforms allow for many activities that simulate social interaction but are not truly interactive. Social comparison also becomes problematic for adolescent users when they compare their own experiences with those of others and feel that their lives are inadequate, leading to feelings of envy and depression.

Social media impacts psychological well-being negatively. Research indicates that social media usage can adversely affect mental health, contributing to issues like excessive reliance on mobile devices, feelings of loneliness, and addiction to social media platforms. Excessive engagement with social media technologies may result in detrimental effects on digital wellness, particularly when considering the emotional aspects associated with these platforms. Social media is found to have negative impacts on psychological well-being including mobile addiction, social isolation, and social media addiction (Ostic et al., 2021). Studies have highlighted potential psychological and physical consequences, such as eye strain, diminished concentration, and disturbances in sleep patterns, arising from prolonged use of social media and mobile devices, so it is important to control digital device usage to maintain well-being (Bora & Neelakandan, 2023).

In Indonesia, the effects of digital usage are related to addiction to using gadgets for social media or gaming. Data from RSJ Cisarua, West Java, in 2018 handled up to 12 children addicted to mobile phones in a month. Meanwhile, RSJ Surakarta Region, Central Java until mid-2019 had treated 35 children and adolescents addicted to mobile phones (Ade, 2021).

Component of Digital Well-Being

Discussing the components of digital well-being, several foundational studies have been found. These components of digital well-being are related to the sense of well-being experienced by teens during their interactions with digital technologies. A study conducted by (Bora & Neelakandan (2023) stated that digital well-being encompasses various dimensions such as mental, physical, social, and emotional health impacted by technology use. Arslankara et al., (2022) noted that Digital Well-Being consists of three dimensions which are Digital Satisfaction, Safe and Responsible Behavior, and Digital Wellness. The concept of satisfaction was used as they are items that reflect the harmony, pleasure, and positive feelings provided by digital technology, and it was considered to be enjoying and feeling pleasure while being intertwined with digital skills. The second factor was named safe and responsible behavior because using digital technologies in a meaningful and correct way is also a requirement of a sense of responsibility. The concept of wellness is defined as "making people feel healthier and happier than feeling relaxation and happiness with digital environments and technologies could be better explained with this concept.

Factors That Affect Digital Well-Being

Understanding the multifaceted influences on digital well-being is crucial in navigating the complexity of the modern digital landscape. Exploring the diverse factors that affect digital well-being reveals the various elements shaping the digital well-being landscape in contemporary society. Digital well-being is influenced by factors such as social media use, mobile app usage, and electronic device usage, which can impact mental wellness and minimize the risk of stress (Bora & Neelakandan, 2023). According to the theoretical model compiled by Vanden Abeele (2021), digital well-being is influenced by person, device, and context-specific factors. These factors create pathways toward an optimal balance between connectivity and disconnectivity, influencing overall well-being outcomes. (1) Person-specific factors related to individual characteristics such as impulsivity and fear of missing out can increase susceptibility to digital media issues. (2) Affective and cognitive states related to mood and boredom when interacting with digital usage experiences affect well-being directly or indirectly. (3) Device-specific factors are related to design choices and technology embedded in devices that influence digital well-being outcomes. (4) Context-specific factors are related to social and situational contexts that play a role in shaping digital experiences and digital well-being. (5) Intrapersonal and interpersonal variability related to well-being which is influenced by a dynamic system of specific personal, device, and contextual factors, highlighting the complexity of digital well-being.

Intervention

To maximize the effectiveness of interventions aimed at improving digital well-being, it is essential to consider the context in which these interventions are applied. Different populations, including adolescents, may respond differently to various strategies depending on cultural, social, and economic factors. For instance, cognitive-behavioral therapy (CBT) has been shown to be effective in addressing digital addiction by helping individuals develop healthier digital habits and coping mechanisms (Ding & Li, 2023). However, the success of CBT and similar interventions may vary across different cultural contexts where perceptions of digital technology and mental health differ.

Family-based interventions are another approach that has shown promise, particularly in contexts where family cohesion is strong. In cultures that value family involvement, such interventions can enhance communication between parents and adolescents, thereby reducing the risks associated with excessive digital use (Ding & Li, 2023). However, in cultures where individualism is more prevalent, these interventions may need to be adapted to focus more on the individual rather than the family unit.

Scientific Contributions and Practical Implications

The findings of this study contribute significantly to the scientific understanding of digital well-being by highlighting the multifaceted nature of this concept and the diverse factors that influence it. This research underscores the importance of considering individual characteristics such as gender, socioeconomic status (SES), and cultural background when developing models of digital well-being. For example, the study reveals that girls are more vulnerable to online harassment and

psychological distress, which suggests that gender-specific interventions are necessary to support their digital well-being (Jayman et al., 2023).

From a practical standpoint, the study offers valuable insights for practitioners, such as psychologists, educators, and policymakers. For psychologists, the findings highlight the need for tailored therapeutic approaches that address the unique challenges faced by different adolescent groups in the digital age. Educators can use these insights to develop digital literacy programs that empower adolescents to engage with digital media safely and responsibly. Policymakers, on the other hand, can use the study's findings to inform the creation of regulations and guidelines that promote digital well-being on a broader scale.

For instance, interventions that promote safe and responsible behavior online could be integrated into school curricula, while policies that encourage the development of digital literacy skills among low-SES adolescents could help mitigate the negative effects of digital engagement in this vulnerable population. By addressing the specific needs of different adolescent groups, these interventions can enhance digital well-being and contribute to healthier and more balanced digital lives.

CONCLUSION

This study highlights the importance of digital well-being among adolescents, focusing on the various challenges that arise from excessive technology use, such as mobile addiction, the negative impacts of social media, and digital stress. The key findings indicate that digital well-being is a multidimensional concept influenced by various factors such as digital satisfaction, safe and responsible behavior, and overall digital health.

The findings suggest that effective interventions must consider different cultural, social, and economic contexts. For example, cognitive-behavioral therapy (CBT) has been shown to be effective in addressing digital addiction by helping individuals develop healthier digital habits and coping mechanisms. However, the success of CBT and similar interventions may vary across different cultural contexts where perceptions of digital technology and mental health differ. Additionally, family-based interventions have also shown promising results, particularly in contexts where family cohesion is strong and parental involvement is high.

This research makes a significant contribution to the understanding of digital well-being by emphasizing the importance of considering individual characteristics such as gender, socioeconomic status (SES), and cultural background when developing models of digital well-being. For instance, the study reveals that girls are more vulnerable to online harassment and psychological distress, indicating that gender-specific interventions are necessary to support their digital well-being.

Practically, the findings provide valuable insights for practitioners such as psychologists, educators, and policymakers. For example, digital literacy programs can be developed to empower adolescents to engage with digital media safely and responsibly. Policies that promote the development of digital literacy skills among low-SES adolescents could help mitigate the negative impacts of digital engagement in this vulnerable population.

Further research is recommended to explore in greater depth the impact of gender and socioeconomic differences on digital well-being, as well as to examine the

effectiveness of various digital interventions across different cultural and social contexts. This study could also expand understanding of how active and passive use of technology affects adolescents' mental health, as well as how technology-based interventions can be effectively implemented to enhance digital well-being across different population groups. Thus, this research not only provides significant theoretical contributions but also offers practical guidance for developing more effective strategies to support adolescent digital well-being in the digital age.

Declaration

Ethics approval and consent to participate

This study was conducted following ethical guidelines, and in this study, there are no applicable participants.

Consent for publication

We confirm that this manuscript is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere.

Availability of Data and Material (ADM)

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests

All authors declare that the manuscript has no conflict of interest.

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Authors' contributions

All authors contributed to the conception and design of the study, data collection, analysis, and interpretation, and drafting of the manuscript.

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