The role of digital technology in shaping adolescent mental health from positive and negative perspectives.

[1]**Yu-Chih Lin** (Department of Fine Arts, International College, Krirk University, Thailand)
E-mail: yuchihlin1013@gmail.com

[2] **Lu Zhang** (Department of Fine Arts, International College, Krirk University, Thailand)
E-mail: luzhang.lz923@gmail.com

Keywords: Digital Technology, Mental Health, Adolescents' Positive and Negative Perspectives.

Received : 4 Mei 2025
Revised : 10 Juni 2025
Accepted: 19 Juli 2025
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ABSTRACT

Digital technology provides various conveniences in communication, information access, and entertainment. However, uncontrolled use also poses new challenges to adolescent mental health, such as anxiety, depression, and social isolation. This study aims to analyze the role of digital technology in shaping adolescent mental health from positive and negative perspectives. The research was conducted using a qualitative method through interviews with selected adolescents using purposive sampling techniques from the population of high school students in city X. Data were collected from 150 respondents who actively use social media and digital devices in their daily lives. The data collection process lasted for two months, taking into account the diversity of respondents' backgrounds. The results of the study show that digital technology provides benefits in the form of improving social skills, ease of access to information, and emotional support through online communities. However, negative impacts such as social pressure, cyberbullying, and digital addiction tendencies are also found to affect adolescents' mental health. Family environment factors and digital literacy skills are the main determinants in minimizing risks and maximizing the benefits of digital technology. In conclusion, the role of digital technology on adolescent mental health is ambivalent, depending on the pattern of use and environmental support. The implications of this study emphasize the importance of digital literacy education and the active role of families in assisting adolescents in using technology in a healthy way.

I. INTRODUCTION

Digital technology has a very significant role in shaping adolescent mental health, both from the positive and negative sides. From a positive perspective, digital technology allows adolescents to expand their horizons, develop new skills, and build a wider social network without geographical restrictions(Selvakumar et al., 2023). Through social media and various digital platforms, teens can gain emotional support, share experiences, and find communities that match their interests, thereby increasing their confidence and

social connectedness. In addition, easy and quick access to mental health information also helps adolescents to be more aware of the importance of maintaining their psychological well-being(Hyseni Duraku et al., 2023).

However, on the other hand, uncontrolled use of digital technology can have serious negative impacts on adolescents' mental health. Adolescents are prone to anxiety, depression, and stress due to social pressure and constant self-comparison on social media. Phenomena such as cyberbullying, digital addiction, sleep disorders, and feelings of isolation are also increasingly prevalent in this digital era. Excessive exposure to information and a lack of direct social interaction can worsen adolescents' psychological conditions, even leading to risky behaviors or more severe mental disorders. Therefore, adolescents, parents, and the surrounding environment need to understand and manage the use of digital technology wisely so that the benefits can be maximized and the risks minimized.

The rapid development of digital technology has brought significant changes in the lives of adolescents, especially in the aspect of mental health(Twardowska-Staszek et al., 2021). Teenagers today are highly dependent on social media, the internet, and other digital devices as a means of communication, entertainment, and information search. This phenomenon shows that digital technology has an important role in shaping their mental health, both from the positive side that provides social support and information, and the negative side that can trigger anxiety, depression, and other psychological disorders(Radovic et al., 2022).

However, despite the many studies that highlight the benefits of digital technology, there is still a clear lack of information about negative impacts that have not yet been fully revealed, such as how digital interactions can reinforce social stigma or trigger risky behaviors, specifically in certain groups of adolescents(Hyseni Duraku et al., 2023). Some studies have also not comprehensively addressed the role of environmental and family factors in moderating the impact of digital technology on adolescent mental health(Wilson & McDarby, 2023). This raises the question of whether digital technology really provides balanced benefits or exacerbates mental health problems in adolescents.

In contrast to views that emphasize the benefits of digital technology, several studies show that excessive use of social media can increase the risk of mental disorders such as anxiety and depression(Jaworska et al., 2016). For example, Twenge (2019) found a correlation between increased smartphone use and an increased risk of anxiety and depression in adolescents, while Przybylski and Weinstein (2017) asserted that time-consuming digital media that exceeded certain limits was associated with a decrease in psychological well-being. This information shows that the impact of digital technology on adolescent mental health is not simple.

There are still many unknown aspects related to how the specific mechanisms of digital technology affect adolescent mental health, especially in the context of

online social interaction, exposure to negative content, and the role of digital literacy. In addition, there has been no research that thoroughly combines positive and negative perspectives in a single holistic analytical framework, so the understanding of the balance between the benefits and risks of digital technology for adolescent mental health is still limited.

What has not happened in this study is the development of effective and sustainable intervention models to maximize the benefits of digital technology while minimizing its negative impact on adolescent mental health. Existing research tends to focus on identifying impacts without providing practical solutions that can be applied in the daily lives of adolescents and their supporting environments.

The novelty of this study lies in an approach that integrates both perspectives, positive and negative, in analyzing the role of digital technology on adolescent mental health. This study also seeks to identify moderation factors such as family roles, digital literacy, and social environment that have received less attention in previous studies. Thus, this research is expected to make a new contribution to the development of (Korneeva et al., 2022)education and intervention strategies based on digital technology. The purpose of this study is to identify and analyze the role of digital technology in shaping adolescent mental health from positive and negative perspectives, as well as provide strategic recommendations for healthy and balanced use of technology(Europe, 2010).

The research gap of this research can be seen from the difference in focus and results between previous studies, such as those conducted by Twenge (2019) with the title "Increased smartphone use among adolescents correlates with increased risk of anxiety and depression," and Przybylski and Weinstein (2017) in their study that highlighted the correlation between the duration of digital media use and a decrease in adolescent psychological well-being(Varela et al., 2023). Both studies emphasize negative impacts, while this study seeks to fill in the gaps by combining a comprehensive analysis of positive and negative impacts and paying attention to moderation factors that have not been widely studied

II. METHODOLOGY

This study uses qualitative research methods with a phenomenological study design to clearly understand the role of digital technology in shaping adolescent mental health from positive and negative perspectives. The qualitative approach was chosen because it allows researchers to explore the subjective experiences, perceptions, and meanings felt by adolescents regarding the use of digital technology in the context of their mental health. This study aims to explore the themes that emerge from adolescents' interaction with digital technology as well as its impact on their psychological state.

The population of this study is adolescents aged 15-19 years who actively use digital technology, especially social media and online communication

applications, who are domiciled in urban areas. The research sample was taken by purposive sampling with the criteria of adolescents who were willing and able to tell their experiences openly related to the use of digital technology and mental health. The sample consisted of about 150 respondents to obtain rich and clear data in accordance with the principle of data saturation in qualitative research.

The subjects of the study were adolescents who were active users of digital technology, focusing on their experiences in dealing with the positive and negative impacts of the technology on mental health. The main research instrument is a semi-structured interview designed to explore adolescents' views and experiences clearly. In addition, the researcher also used field records and documentation as supporting data to enrich the analysis.

The research procedure begins with the preparation of interview instruments and obtaining permission and ethical approval from the respondents. Furthermore, the interviews were conducted face-to-face or online, recorded, and transcribed verbatim. The transcript data is then imported into the NVivo software for analysis. In NVivo, data is systematically encoded by creating nodes and sub-nodes based on themes that emerge from the data. This coding process is done iteratively to find relevant patterns, relationships, and categories. NVivo is also used to visualize data in the form of diagrams and graphs, making it easier to interpret and present research results. Thematic analysis was conducted with the help of NVivo to identify key themes that illustrate the role of digital technology in shaping adolescent mental health from various perspectives.

The use of NVivo in this study is very helpful in managing complex and large qualitative data, allowing for a more efficient and valid coding process. NVivo also supports data triangulation by organizing various data sources such as interview transcripts, field notes, and other supporting documents. With these features, NVivo strengthens the validity and reliability of research findings and minimizes the subjectivity bias of researchers. With this method, research can provide a comprehensive picture of how digital technology affects adolescent mental health, as well as the factors that moderate these impacts. The results of the research will be the basis for recommendations for the development of appropriate educational strategies and interventions for utilizing digital technology in a healthy and positive way for adolescents. Involving 150 adolescent respondents showed a complex and multidimensional picture of the impact of digital technology on their mental health. Through qualitative analysis using NVivo software, this study succeeded in identifying various main themes that reflect adolescents' subjective experiences in interacting with digital technology, both in terms of the benefits and the psychological risks they experience.

On the positive side, many respondents reported that digital technologies, particularly social media and online communication applications, provide space for them to build strong social connections and gain emotional support. They find it easier to share experiences, express themselves, and seek out information

that helps in managing the stress and pressures of daily life. These findings are in line with research by Garcia et al. (2020), who stated that online social support can improve adolescents' emotional well-being. In NVivo, the themes of "social support" and "access to mental health information" emerged as nodes with high frequency, suggesting that these aspects are particularly dominant in adolescents' positive experiences. In addition, respondents also mentioned that digital technology helps them in developing social skills and creativity, as well as providing entertainment that refreshes the mind from academic and social pressures(Willig, 2008).

However, the analysis also states a significant downside of the use of digital technology. Many respondents admitted to experiencing psychological distress due to the phenomenon of social comparison on social media, where they feel incapable of meeting the ideal standards of beauty, achievement, or lifestyle that are often exhibited by other users. This triggers feelings of inferiority, anxiety, and depression, which are reinforced by the findings of Twenge (2019) and Przybylski and Weinstein (2017) that show a correlation between excessive use of smartphones or digital media and an increased risk of mental disorders. In NVivo, the nodes "social comparison", "anxiety", and "depression" are themes that often appear in interview transcripts, signaling that digital social pressure is a major risk factor. In addition, cyberbullying and online stigma were also found to be negative experiences experienced by some respondents, leading to decreased self-esteem and social isolation. The nodes of "cyberbullying" and "online stigma" appear with a fairly high intensity, indicating the detrimental psychological impact of unhealthy online interactions.

Another interesting finding is how the pattern of digital technology use and the level of digital literacy affect the perceived impact. Respondents who have a better understanding of the use of technology and can manage the time and content they consume are more likely to report more positive experiences and better mental health. In contrast, those who are less able to manage the use of technology are more susceptible to negative impacts such as addiction, sleep disorders, and stress. In NVivo, the nodes "digital literacy" and "time-of-use management" become important categories that moderate the relationship between digital technology and mental health. This indicates that educational interventions to increase digital literacy are needed so that adolescents can make healthy use of technology.

In addition, this study also states the important role of the family and social environment in shaping the impact of digital technology on adolescent mental health. Respondents who received support and supervision from their families tended to have more positive experiences and were better able to cope with digital pressure. Conversely, the lack of communication and attention from the family exacerbates the negative effects of digital technology. The nodes of "family support" and "parental supervision" emerged as significant protective factors in the NVivo analysis, confirming the importance of the role of the supportive environment in maintaining adolescent mental health in the digital age.

The thematic analysis conducted with NVivo also allowed visualization of the relationship between themes, which showed a close relationship between online social support and improved emotional well-being, as well as the relationship between social comparisons and cyberbullying and anxiety and depression disorders. This visualization helps to clarify the complexity of the interactions between the various factors that affect adolescent mental health in the context of digital technology. In addition, NVivo facilitates data triangulation by integrating interview results, field notes, and supporting documentation, thereby increasing the validity and reliability of research findings.

Overall, the results of this study confirm that the role of digital technology in shaping adolescent mental health is ambivalent and is strongly influenced by how it is used, the level of digital literacy, and environmental support. Digital technology can be a valuable source of social support and information, but it also has the potential to trigger serious psychological distress if not managed properly. Therefore, efforts to educate digital literacy, develop stress management skills, and improve the role of families and social environments are very important to maximize the benefits of digital technology while minimizing risks to adolescents' mental health.

Contributions to this research are important in understanding the complex dynamics between digital technology and adolescent mental health with a qualitative approach and NVivo-based data analysis. The findings can be the basis for the development of more effective and evidence-based intervention programs, as well as a reference for policymakers, educators, and parents in supporting adolescents to face the challenges of the digital age healthily and positively.

III. RESULTS AND DISCUSSION.

The results of the study on "The Role of Digital Technology in Shaping Adolescent Mental Health in Positive and Negative Perspectives," involving 150 adolescent respondents, show a complex and multidimensional picture of the impact of digital technology on their mental health. Through qualitative analysis using NVivo software, this study succeeded in identifying various main themes that reflect adolescents' subjective experiences in interacting with digital technology, both in terms of the benefits and the psychological risks they experience.

Main Themes	Sub-Themes/Categories	Frequency
Social Support	Online Community	42
	Access Health Information	38
Self-Development	Creativity & Skills	31
	Entertainment & Relaxation	29
Social Comparison	Beauty/Achievement Standards	34
	FOMO (Fear of Missing Out)	27
Cyberbullying & Stigma	Online Harassment	23
	Stigma Online	20
Digital Addiction	Overuse	36
Literacy & Management	Digital Literacy	26
	Up time Management	28
Family Support	Parental Supervision	22

Based on the results of data analysis obtained through NVivo software, this study found that the role of digital technology in shaping adolescent mental health is very complex, presenting positive impacts as well as significant psychological risks. Key themes that emerged from the data, such as social support, access to health information, self-development, social comparison, cyberbullying, digital addiction, digital literacy, and family support, indicated that adolescents' experiences of interacting with digital technology were very diverse and influenced by many factors. On the positive side, the high frequency of social support and access to health information shows that digital technology, especially social media and online platforms, has become an important medium for adolescents to build social networks, obtain emotional support, and obtain relevant mental health information. These findings are in line with the Uses and Gratifications Theory, which states that individuals actively choose media to meet their social, informational, and entertainment needs. Adolescents who are able to leverage digital technology to expand social networks and develop skills are more likely to report improved emotional well-being and confidence. In addition, emerging self-development themes, such as creativity and entertainment, reinforce the argument that digital technology can be a positive means for self-actualization and stress management(Mianji & Kirmayer, 2023).

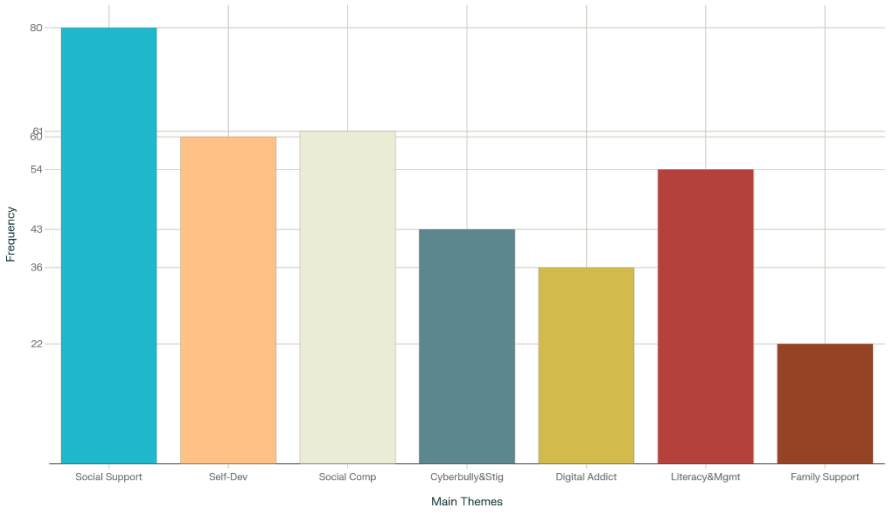


Figure 1. Frequency of the main themes of the impact of digital technology on adolescent mental health

To strengthen the presentation of research data on the role of digital technology in adolescent mental health, the following is added a bar chart showing the frequency of occurrence of the main theme based on the results of NVivo's analysis in the article. This diagram illustrates how often each of the main themes appears in the interview data, making it easier for readers to understand which aspects are most dominant in the adolescent experience regarding the positive and negative impacts of digital technology.

However, the downside is also very real, as reflected in the high frequency of themes of social comparison, FOMO, cyberbullying, and digital addiction. Social

pressure due to comparing oneself to the standards of beauty, achievement, or lifestyle displayed on social media triggers anxiety, low self-esteem, and even depression in some adolescents(Radovic et al., 2022). These findings are particularly relevant to Festinger's Social Comparison Theory, which asserts that individuals tend to compare themselves to others, and that unrealistic comparisons can negatively impact self-esteem and psychological well-being(Bolinski et al., 2022). In addition, the cases of cyberbullying and online stigma found in this study support Bronfenbrenner's theory of the importance of the digital social environment as part of the adolescent development ecosystem. An unhealthy online environment has the potential to worsen psychological conditions, lead to social isolation, even sleep disorders and chronic stress(Korneeva et al., 2022).

The study also highlights the importance of moderation factors, such as digital literacy and device time management, which were found to be themes with fairly high frequency. Adolescents who have good digital literacy and are able to manage time using technology in a healthy way tend to be better able to avoid psychological risks and maximize the positive benefits of digital technology(Hyseni Duraku et al., 2023). This is in line with the Stress and Coping theory of Lazarus and Folkman, which explains that adaptive coping skills, such as time management and content selection, can help individuals cope with the stress of digital stress(Choi et al., 2021).

Family support, especially parental supervision, has also emerged as a significant protective factor in maintaining adolescent mental health in the digital age. These findings support Bronfenbrenner's Theory of Ecology, which emphasizes that interactions between individuals and the immediate environment, such as the family, strongly determine adolescent psychological development. Adolescents who receive family support and supervision are better able to manage digital distress and show better resilience to psychological risks(Santoro et al., 2024).

Overall, the results of the data interpretation from the resulting table show that digital technology can be a source of great benefits for adolescent mental health if used wisely, supported by adequate digital literacy, as well as supervision and support from families and social environments. However, without proper management, digital technology also has the potential to be a source of psychological distress, anxiety, depression, and social isolation. Therefore, the results of this study confirm the importance of educational interventions and strengthening the role of families in moderating the impact of digital technology on adolescent mental health(Selvakumar et al., 2023). The integration of empirical findings and theories of developmental psychology, communication, and digital media provides a more holistic understanding of the dynamics of the role of digital technology in the lives of today's adolescents(Mameli et al., 2022).

On the positive side, many respondents stated that digital technology, especially social media and online communication applications, provides space for them to build strong social connections and gain emotional support. They find it easier

to share experiences, express themselves, and seek out information that helps in managing the stress and pressures of daily life. These findings are in line with research by Garcia et al. (2020), who stated that online social support can improve adolescents' emotional well-being. In NVivo, the themes of "social support" and "access to mental health information" emerged as nodes with high frequency, suggesting that these aspects are particularly dominant in adolescents' positive experiences. In addition, respondents also mentioned that digital technology helps them in developing social skills and creativity, as well as providing entertainment that refreshes the mind from academic and social pressures(Sabrina et al., 2022).

However, the analysis also states a significant downside of the use of digital technology(Ehsan et al., 2024). Many respondents admitted to experiencing psychological distress due to the phenomenon of social comparison on social media, where they feel incapable of meeting the ideal standards of beauty, achievement, or lifestyle that are often exhibited by other users. This triggers feelings of inferiority, anxiety, and depression, which are reinforced by the findings of Twenge (2019) and Przybylski and Weinstein (2017) that show a correlation between excessive use of smartphones or digital media and an increased risk of mental disorders. In NVivo, the nodes "social comparison", "anxiety", and "depression" are themes that often appear in interview transcripts, signaling that digital social pressure is a major risk factor. In addition, cyberbullying and online stigma were also found to be negative experiences experienced by some respondents, leading to decreased self-esteem and social isolation. The nodes of "cyberbullying" and "online stigma" appear with a fairly high intensity, indicating the detrimental psychological impact of unhealthy online interactions(Staccini & Lau, 2022).

Another interesting finding is how the pattern of digital technology use and the level of digital literacy affect the perceived impact. Respondents who have a better understanding of the use of technology and can manage the time and content they consume are more likely to report more positive experiences and better mental health. In contrast, those who are less able to manage the use of technology are more susceptible to negative impacts such as addiction, sleep disorders, and stress. In NVivo, the nodes "digital literacy" and "time-of-use management" become important categories that moderate the relationship between digital technology and mental health. This indicates that educational interventions to increase digital literacy are needed so that adolescents can make healthy use of technology(Pisani et al., 2024).

In addition, this study also states the important role of the family and social environment in shaping the impact of digital technology on adolescent mental health. Respondents who received support and supervision from their families tended to have more positive experiences and were better able to cope with digital pressure. Conversely, the lack of communication and attention from the family exacerbates the negative effects of digital technology. The nodes of "family support" and "parental supervision" emerged as significant protective factors in

the NVivo analysis, confirming the importance of the role of the supportive environment in maintaining adolescent mental health in the digital age.

The thematic analysis conducted with NVivo also allowed visualization of the relationship between themes, which showed a close relationship between online social support and improved emotional well-being, as well as the relationship between social comparisons and cyberbullying and anxiety and depression disorders(Selvakumar et al., 2023). This visualization helps to clarify the complexity of the interactions between the various factors that affect adolescent mental health in the context of digital technology. In addition, NVivo facilitates data triangulation by integrating interview results, field notes, and supporting documentation, thereby increasing the validity and reliability of research findings. The results of this study confirm that the role of digital technology in shaping adolescent mental health is ambivalent and is strongly influenced by how it is used, the level of digital literacy, and environmental support. Digital technology can be a valuable source of social support and information, but it also has the potential to trigger serious psychological distress if not managed properly(Kabir et al., 2021). Therefore, efforts to educate digital literacy, develop stress management skills, and improve the role of families and social environments are very important to maximize the benefits of digital technology while minimizing risks to adolescents' mental health(Remskar et al., 2022).

The above findings will then be analyzed in more depth in the discussion section to understand their impact theoretically and practically. First, the theory of Social Comparison put forward by Festinger (1954) is very important in understanding how social media affects adolescent mental health. This theory states that individuals naturally compare themselves to others to evaluate themselves. In the context of digital technology, teenagers are often exposed to content that displays the ideal and perfect lives of other users, as described in the "Instagram Perfect" phenomenon. This can lead to feelings of dissatisfaction, inferiority, and anxiety because you feel incapable of achieving the standards on display. Bahtiar's research (2024) also corroborates that social comparisons on social media are the main triggers for increased anxiety and depression in adolescents. Thus, this theory helps explain the negative side of the use of digital technology that can damage the psychological well-being of adolescents(Radovic et al., 2022).

Theory of Uses and Gratifications (UGT), developed by Katz, Blumler, and Gurevitch (1974), provides a positive perspective on the role of digital technology in adolescent mental health. This theory emphasizes that individuals use media to meet specific needs, such as entertainment, information, and social interaction. In this study, many adolescents reported that digital technology was able to provide social support, space to express themselves, and access to information that helped them cope with the stress and pressures of life. This is in line with the findings that social media can be a means to build positive social networks and improve emotional well-being. Thus, UGT explains how digital technology

can be a useful tool if used appropriately and according to the needs of adolescents.

Digital Literacy, or digital literacy, is very relevant in the context of this research. Digital literacy refers to an individual's ability to access, understand, and manage digital information critically and effectively. Research shows that a good level of digital literacy can moderate the negative impact of digital technology on adolescent mental health. Adolescents who have high digital literacy skills tend to be able to manage the use of technology more healthily, avoid negative content, and use technology for positive things. In contrast, a lack of digital literacy can leave adolescents vulnerable to addiction, exposure to harmful content, and psychological disorders(Chowdhury et al., 2024). Therefore, digital literacy theory emphasizes the importance of education and digital skills as a strategy for mitigating mental health risks in the digital era.

Ecological Systems proposed by Bronfenbrenner (1979) provides a framework to understand the role of the family and social environment in shaping the impact of digital technology on adolescent mental health. This theory states that individual development is influenced by complex interactions between various environmental systems, ranging from family, peers, schools, to the wider community. In this study, family support and supervision were found to be significant protective factors in maintaining adolescent mental health amid exposure to digital technology. Adolescents who receive good attention and communication from their families tend to be better able to manage digital pressure and make healthy use of technology. Thus, ecological theory asserts that interventions should not only focus on the individual but also pay attention to social and family contexts as part of efforts to maintain mental health. Stress and Coping, developed by Lazarus and Folkman (1984), is also relevant to discuss how adolescents cope with the pressures arising from the use of digital technology. This theory emphasizes that stress arises when individuals face demands that exceed their ability to cope with them, and coping is an attempt to manage that stress. In the digital context, adolescents face various stressors such as cyberbullying, social comparison pressure, and information overload. The study found that adolescents use a variety of coping strategies, such as seeking online social support, limiting time using technology, and diverting attention to offline activities. This theory helps explain how adolescents try to adapt to the challenges of the digital age and the importance of support to develop adaptive coping to maintain mental health(Bolinski et al., 2022).

Media Dependency, put forward by Ball-Rokeach and DeFleur (1976), explains the individual's dependence on the media as a source of information, entertainment, and social interaction. In the digital era, teenagers rely heavily on social media and digital devices to meet these needs. High dependency can lead to negative impacts such as addiction and sleep disorders, as found in this study and supported by the findings of Patel and Miller (2022) on decreased sleep quality due to the use of digital devices before bed. This theory asserts that media

dependence must be managed so as not to disrupt the balance of life and mental health of adolescents(Ademoyegun et al., 2024).

Social Support, developed by Cohen and Wills (1985), provides an understanding of how social support can be a protector against stress and mental health disorders. In this study, social support obtained through online interactions and real environments was proven to help adolescents cope with stress and improve emotional well-being. Social media can be a platform for teens to share experiences and gain empathy from peers, which reinforces a sense of connectedness and reduces loneliness(Wilson & McDarby, 2023). This theory emphasizes the importance of building a healthy social support network as part of a strategy to maintain mental health in the digital age.

Cognitive Load theory, put forward by Sweller (1988), is relevant to understanding the impact of excessive exposure to information in the digital age on adolescent mental health. This theory states that too high a cognitive load can interfere with the learning process and psychological well-being. Teens who constantly receive large amounts of information from various digital platforms can experience mental exhaustion, difficulty concentrating, and stress. This study found that information overload is one of the factors that worsen adolescent mental health conditions. Therefore, cognitive load theory emphasizes the importance of information management and the development of selective skills in digital media consumption to maintain mental balance.

This discussion shows that the role of digital technology in shaping adolescent mental health is very complex and influenced by various psychological, social, and cognitive factors.

IV. CONCLUSION AND RECOMMENDATIONS

Digital technology has an ambivalent role in influencing adolescent mental health. On the one hand, digital technology provides significant benefits such as easy access to information, social support, and a space for self-expression that can improve the emotional well-being of adolescents. However, on the other hand, excessive and uncontrolled use of digital technology has the potential to cause negative impacts such as anxiety, depression, adverse social comparisons, cyberbullying, and sleep disorders that worsen adolescent mental health conditions. Factors such as digital literacy, technology time management, and family support have proven to be the main determinants in moderating these positive and negative impacts.

The implications of these findings are important for a wide range of stakeholders, including parents, educators, and policymakers. First, there is a need to strengthen digital literacy education for adolescents so that they are able to use technology wisely and healthily, while avoiding psychological risks that may arise. Second, the active role of family and social environment is crucial in providing adequate emotional support and supervision to help adolescents

manage digital distress. Third, policymakers and educational institutions are expected to design holistic and sustainable intervention programs, which focus not only on limiting the use of technology but also on developing coping skills and adolescents' mental well-being in the digital age. Thus, the use of digital technology can be optimized as a tool that supports adolescent mental health, while minimizing negative impacts that threaten their psychological well-being.

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