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Digital resilience in adolescence: A systematic review of models, methods and theoretical perspectives

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Abstract The use of digital technology that supports daily activities has a positive impact on individual psychological well-being. However, the intensity of online digital technology makes individuals face some online risks, namely, content, contact, and conduct risks, especially in adolescents. Teenagers are considered a population at online risk, so adolescents need to develop the ability to deal with and through online challenges called Digital Resilience (DR). Digital resilience studies continue to grow over time. This causes many researchers to continue to study of digital resilience by compiling, comparing, and testing the preexisting conceptual models. This research focuses on conducting a Systematic Literature Review (SLR) with the PRISMA method in the Scopus, Google Scholar, and Crossref articles from 2020-2024. The data search found 255 articles but only 38 relevant articles were analyzed to answer questions related to the definition of digital resilience in psychology studies, the general methods used and population descriptions in digital resilience research, the theoretical perspectives used in digital resilience studies, and the conceptual model description of digital resilience. The study results indicate that digital resilience is an individual's ability to protect themselves and recover from detrimental actions when using digital media online. Over the past five years, mixed methods, qualitative, and literature reviews have been commonly used in digital resilience research, while quantitative methods are still limited. Likewise, the adolescent population is still limited to be studied in digital resilience research. Thus far, researchers have used an ecological theory perspective to explain digital resilience. In addition, three conceptual models of digital resilience were found, and 2 of them still require empirical testing in further research. The findings of the study provide an opportunity for future researchers to empirically test digital resilience models in the adolescent population.

Keywords: technology, online, risk, psychology

1. Introduction

In recent years, digital resilience has become an exciting topic for psychology research. Digital resilience is a relatively new characteristic that requires further study (Sun et al., 2022). Digital resilience studies have not focused only on psychology; in recent years, digital resilience has been examined in technology. Digital resilience in technology focuses on resilience to the threat of damage to digital devices, for example, due to affected natural disasters and irresponsible parties such as hackers. In contrast, digital resilience in the realm of psychology focuses on the ability of individuals to overcome the pressure felt due to exposure to online risks so that individuals think about psychological well-being when actively using digital media connected to the internet (Cabello-Hutt et al., 2018; Dhahir, 2018; Dhir & Khalil, 2017; Sun et al., 2022)

Advances in technology that have penetrated throughout the world have the noble goal of helping realize the welfare of society (Fadhli et al., 2023; Hammond, et al., 2024; Pan et al., 2024; Sun et al., 2022). However, using technology in daily life is similar to a two-edged knife that presents excellent opportunities for its users but can simultaneously deliver some risks to users (Camara et al., 2017; Putri et al., 2024). The many opportunities and risks continue to overshadow individuals who actively use digital media connected to the internet.

Livingstone and Haddon (2012) explained three risks that allow individuals, especially children and adolescents, to interact with the online world in learning and daily adolescent situations: content, contact, and conduct risks (Livingstone & Haddon, 2012). Content risks are related to adolescents being exposed to various shows, images, and texts that are detrimental or harmful to their development—for example, aggressive content, pornography, racist content, and negatively charged advertisements. Contact risks are related to the risk of adolescent contact and are related to others or parties who are detrimental and endanger them physically and psychologically. These include contact with perpetrators of violence, people who lurk for destructive purposes, contact perpetrators of sexual harassment and exploitation, contact actors who are or will

abuse personal data, and so forth. Conduct Risks illustrate risks that allow adolescents to become victims of adverse and harmful behavior from others. Examples of conduct risk include being a victim of bullying, a victim of violence such as sexual violence, a victim of instilling certain ideologies, a victim of harmful marketing promotions, and copyright infringement (Hendriani, 2018; Przybylski et al., 2014; Vissenberg & D'haenens, 2020).

Although online risk exposure does not always cause losses, individuals are still less demanding when facing dangerous situations online (Vandoninck et al., 2013). This condition should receive special attention, primarily focused on the youth group, given that teenagers constitute the largest group in the world that is active in digital media connected to the internet (Anasuyari & Latifah, 2023; Nesi et al., 2020). Survey results show that adolescents use the internet to access social media, news, and entertainment; look for information on goods/services; make purchases of goods/services; send or receive emails; learn online; and meet other daily needs (Muhamad, 2024). This condition requires attention so that teenagers can maximize online opportunities, minimize risks, and overcome risks when using the internet for any purpose. Therefore, individuals actively using digital media connected to the internet must develop their digital resilience. Developmental psychology theory explains that resilience describes healthy development in individuals from at-risk populations (Smith-Osborne, 2007). On the basis of the initial explanation, it is clearly illustrated that adolescents are considered populations at online risk. Therefore, one of the abilities that needs to be developed by adolescents who actively use digital media connected to the internet is digital resilience. Teenagers who cannot overcome online risk will have difficulty achieving their psychological well-being (well-being) (Vissenberg et al., 2022; Vissenberg & D'haenens, 2020). Another study revealed that students' digital resilience, in this case, that of teenagers in schools, is very low; thus, all elements of society are expected to be aware of the importance of building digital resilience (Ardimen et al., 2019).

Adolescence is when individuals begin to train themselves to face their situations and even try to go through them with their abilities (Bergin, 2023; Octavia, 2020). Likewise, when adolescents actively use the internet, it is hoped that they can overcome the risks or psychological pressures that threaten them when they surf in the online world (Hendriani, 2018; Martzoukou et al., 2023; Przybylski et al., 2014). Research on digital resilience in adolescents is still limited. Hence, the opportunity to review digital resilience is still wide open. Therefore, to strengthen further research, it is necessary to perform a systematic literature review related to digital resilience.

This paper reviews comprehensive research findings between 2020 and 2024 using existing datasets. The researcher referred to previous research themes, including the basic concepts of digital resilience, methods and populations commonly used to study digital resilience, theoretical perspectives in reviewing digital resilience, and diverse digital resilience conceptual models. From this explanation, several research questions (RQs) became benchmarks for achieving the purpose of this SLR.

RQ1: What is the definition of digital resilience in psychology studies?
RQ2: What methods are commonly used by digital resilience researchers?
RQ3: How is the description of the research population in the study of digital resilience?
RQ4: What is the theoretical perspective used by previous researchers to describe digital resilience?
RQ5: How do we describe the conceptual model of digital resilience?

The results of this study are presented in detail in the writing structure, such as 1) the background of digital resilience studies, 2) the SLR methodology used, 3) the approach and method of literature review, 4) the results of literature reviews aimed at answering research questions, and 5) conclusions and implications that researchers propose for further study.

2. Methods

This section explains the systematic literature review (SLR) methodology referred to by the researcher. Researchers have passed several stages to identify the concept of digital resilience. This SLR aims to identify the previous research gap and comprehensively reviews the research results from 2020-2024. Many studies related to the definitions, methods, populations, theory perspectives, and conceptual models of digital resilience are interesting. This work makes the study of digital resilience more straightforward and can be used to understand the development of this study in the future.

2.1. Selection criteria papers

The researcher's initial stage is to determine the article criteria from previous studies. The articles collected are sourced from scientific article publishers and several scientific conferences from 2020-2024. The following are the initial selection criteria for the article:

1. Articles that explain the concept of digital resilience in psychology.
2. Articles published by reputable journals or publishers.

2.2. Search method used

The search method used was automatic and manual. Both methods are carried out to find articles related to the main study, namely, the concept of digital resilience. Some keywords are used to search, such as the idea of digital resilience,

conceptual models of digital resilience, digital resilience and psychological well-being, online resilience, and the resilience of digital media users. Furthermore, researchers search for articles automatically via Publish & Perish applications that provide access to reputable journals such as Scopus-indexed journals, Google Scholar, and Crossref. In each index, the researcher gained more than 200 published articles regarding digital resilience from 2020-2024 (Sucipto et al., 2024).

Furthermore, the researcher continued the search process manually by screening the articles for the literature review. The results of the two methods involve a collection of articles recorded in Microsoft Excel. This method also helps researchers identify and reduce duplicate data findings.

2.3. Selection process papers

At this stage, the researcher chooses the articles needed for the SLR concerning the flow shown in Figure 1.

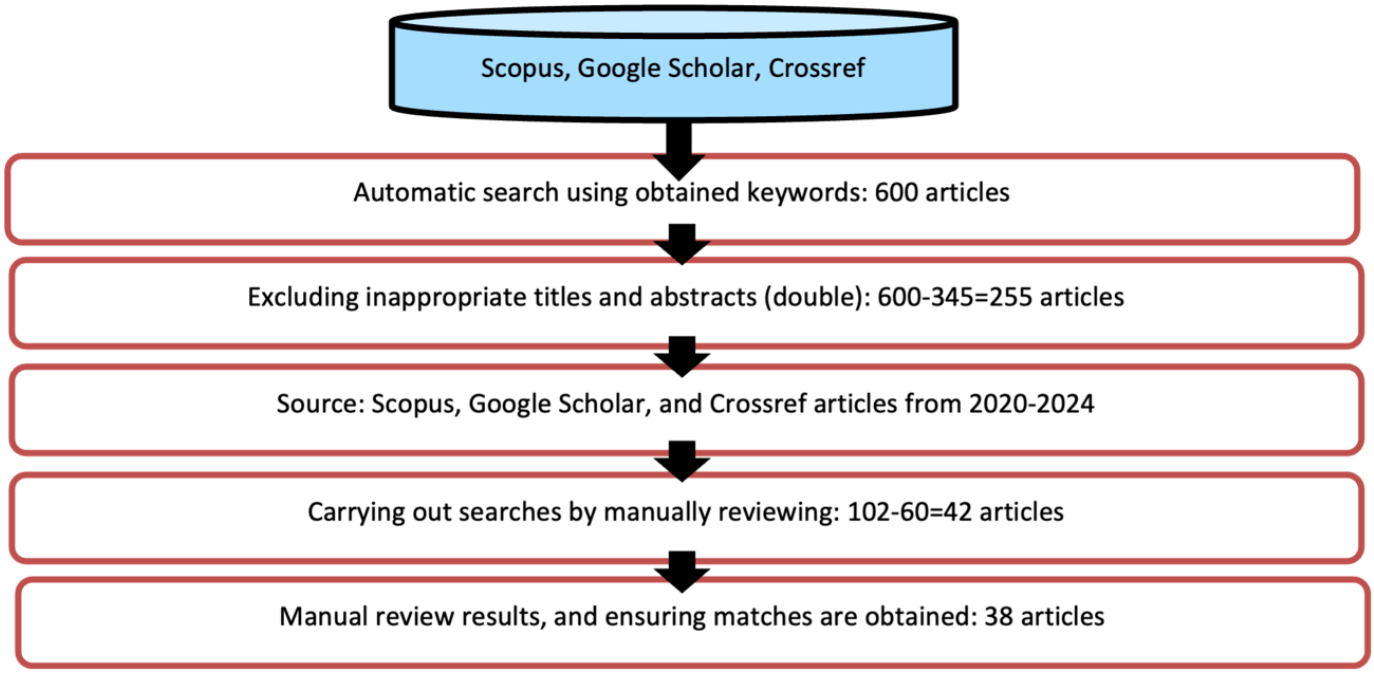

Figure 1 Search method.

Figure 1 shows a collection of articles obtained with the help of the Publish or Perish application. The comprehensive search results from Scopus, Google Scholar, and Crossref yielded 600 articles that reviewed digital resilience. Furthermore, irrelevant and duplicated articles were excluded from the titles and abstracts, so 255 articles remained. The following selection excluded articles whose content was irrelevant to the research topic. The results revealed that 102 articles remained. A manual review was subsequently conducted to determine the article's relevance to the research topic, and 42 articles remained. The final filtering process was a manual review to ensure the suitability of the article content with the research questions until 38 articles were obtained, which became the data source for this literature study. The following describes the number of articles identified after the selection process (Table 1).

Table 1 Article selection process.

No	Source	Automated Search	Related abstract
1	Scopus	200	9
2	Google Scholar	200	20
3	Crossref	200	9
Total		600	38

Figure 2 provides an overview of the distribution of references based on the last five years. The results obtained from the search and selection were 38 articles. The widest distribution is in 2022 and 2024, with ten articles each. Nine research articles are in second place in 2023. Six articles were published in 2021, and 3 were published in 2020. Thus, most SLR processes use the latest research as a reference and include various methods.

In general, this study employs the systematic literature review method, which aims to identify, review, interpret, and evaluate all previous research relevant to the topic being studied. This is done by formulating research questions and then reviewing scientific articles based on systematic scientific steps, as illustrated in Figure 3 (PRISMA statement, 2020).

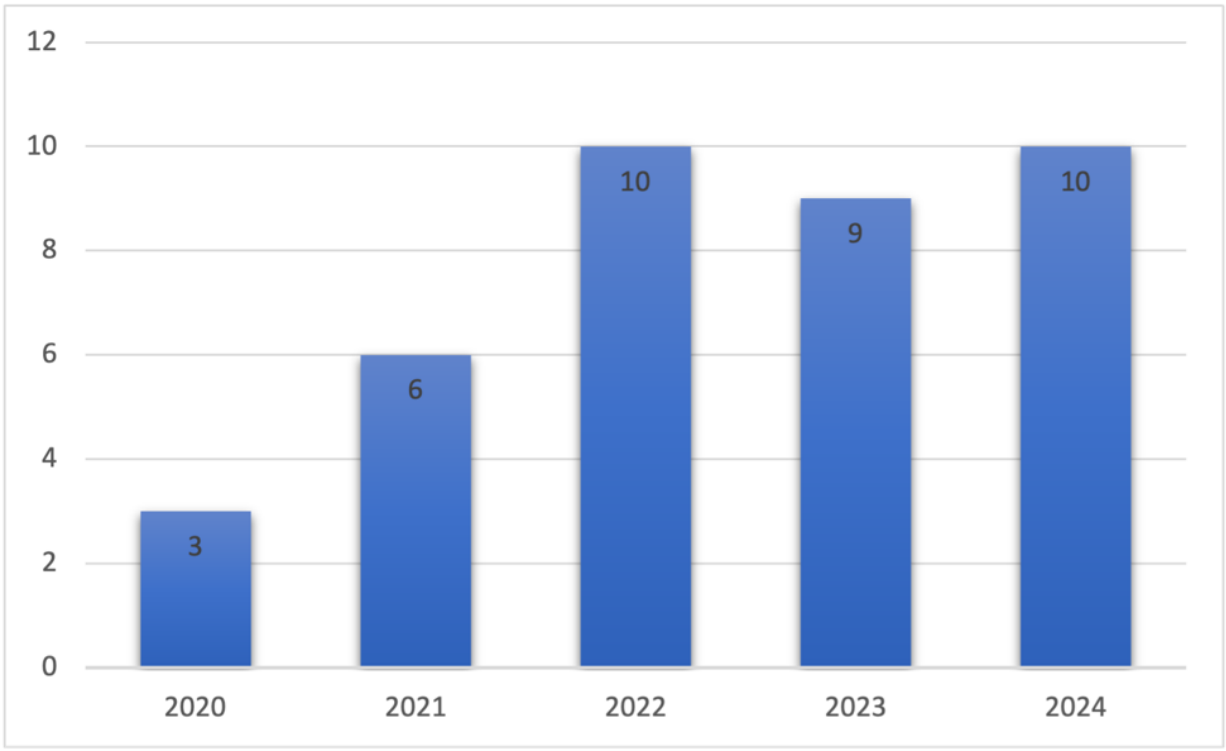

Figure 2 Number of articles by year of publication. *Source:* Scopus, Google Scholar, Crossref Database.

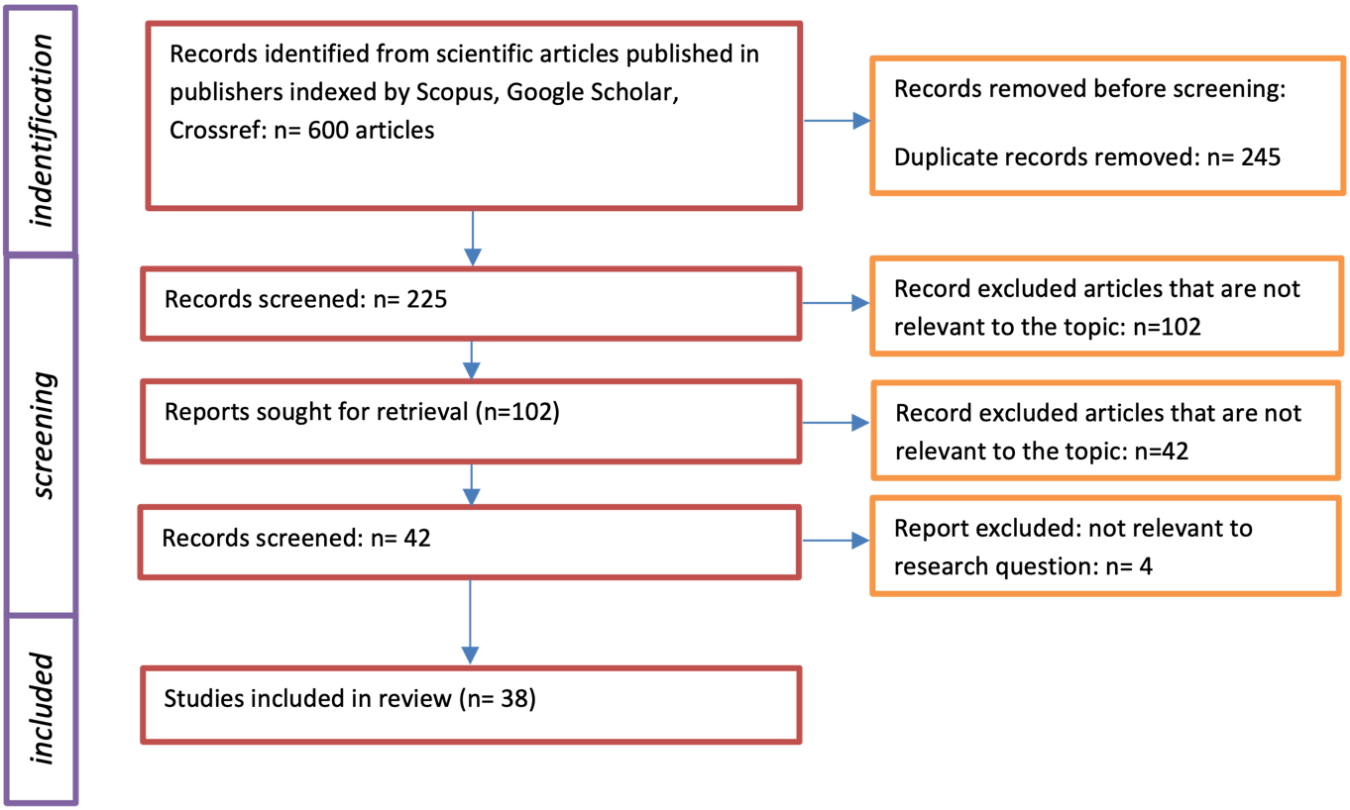

Figure 3 Flowchart of the search process

3. Results and Discussion

3.1. Definition of digital resilience

"Digital resilience" and "online resilience" are often used interchangeably or in similar contexts. The researcher uses digital resilience in this study, which refers to several online resilience studies. Digital resilience highlights a person's ability to

manage and overcome psychosocial risks associated with the use of digital technology connected to the internet, such as cyberbullying, addiction to digital tools, or pressure to appear perfect on social media. Thus, digital resilience focuses on individual well-being in the context of the use of digital technology connected to the internet (d'Haenens et al., 2013; Przybylski et al., 2014; Sun et al., 2022; Vandoninck et al., 2013; Vissenberg et al., 2022; Vissenberg & D'haenens, 2020; Wisniewski et al., 2015).

Research in Australia explains that digital resilience is the ability of individuals to adapt emotionally to the use of digital media (Eri et al., 2021). In addition, digital resilience is individual resilience to harmful situations when accessing digital content (Meng et al., 2023). Digital resilience is also understood as the ability to help children utilize technology and protect them from online risk (Lee & Hancock, 2023; Vandoninck et al., 2013; Wisniewski et al., 2016).

Other studies also formulate the notion of digital resilience as the capacity and process of the individual dynamic cycle to change the performance of their psychological behavior and function through understanding risk, knowing approaches, learning knowledge and skills, recovering from stress, and moving forward when facing various threats related to digital technology in the environment, especially in schools (Sun et al., 2022). Individuals with high digital resilience tend to maintain emotional and mental balance in an online environment full of uncertainty or conflict. Conversely, individuals lacking digital resilience are vulnerable to emotional and social conflicts (Vandoninck et al., 2011, 2013).

Individuals with adequate digital resilience demonstrate several abilities, such as protecting themselves from unpleasant actions in cyberspace, combating pornographic content, maintaining personal and others' secrets, and managing digital media usage (screen time). Other abilities include filtering, analyzing, and critically evaluating information presented in online media, as well as displaying polite behavior in cyberspace (Setyawati et al., 2022). Digital resilience studies in individuals are essential, as confirmed by the definition of digital resilience put forward by Hariadi et al., namely, the ability of individuals to develop a critical mindset when accessing digital information. Critical thinking can reduce individuals' vulnerability to potentially dangerous information (Hariadi et al., 2023). Information on the internet and social media platforms is often presented persuasively but misleadingly. Digital resilience skills help individuals determine direction or provide information guidelines, positively address the risks faced in cyberspace, protect themselves from various kinds of detrimental information, and reduce their vulnerability. That is, digital skills are predicted to strengthen individuals' digital resilience.

Therefore, it can be concluded that digital resilience is the ability to protect oneself and rise from negative experiences when digital media is used online. Risks and digital resilience go hand in hand because digital resilience can only develop through exposure to risks or events in direct contact with online activities that cause stress, as explained in the concept of resilience. When individuals learn to overcome difficulties (online), they develop digital resilience.

3.2. Methods commonly used in digital resilience studies

With respect to the results of previous research, the methods used in the past five years were dominated by systematic literature reviews and qualitative methods (Bluteau & Bluteau, 2020; Hammond, et al., 2023; Hammond, et al., 2023; Harris & Johns, 2021; Mols et al., 2023; Rodrigo et al., 2024; Setyawati et al., 2022; Sun et al., 2022; Vissenberg et al., 2022). Another widely used method is mixed methods (Al-Abdulghani, 2021; Eri et al., 2021; Hammond, et al., 2024; Kurniadi et al., 2023; Qi & Yang, 2024). Only a small portion of digital resilience research uses quantitative methods (Pan et al., 2024; Ragni et al., 2022). These results illustrate that digital resilience studies using quantitative methods are excellent opportunities for further research. A previous study also revealed a gap in research and requires further study, namely, the absence of a consistent conceptualization of digital resilience. Therefore, there are opportunities for further researchers to test (quantitative methods) contextual models' digital resilience, especially in age groups that are considered to have high online risk. When digital resilience can develop in the personalities of everyone, it can help individuals utilize technology optimally while protecting themselves from online risk (Lee & Hancock, 2023; Vandoninck et al., 2013; Wisniewski et al., 2016).

3.3. Populations in the study of digital resilience

Data on the results of the literature review illustrate that existing digital resilience research has focused on children/elementary school students (Hammond, et al., 2024; Hammond, et al., 2023, 2024; Kaewseenual & Sittichai, 2021; Lee & Hancock, 2023; Meng et al., 2023). In addition, the other age populations that dominate digital resilience research are the adult/college population (Eri et al., 2021; Kurniadi et al., 2023; Ragni et al., 2022; Rodrigo et al., 2024; Shiraev & Levy, 2020; Zayed, 2024) and minority circles (Craig et al., 2023). This result implies that digital resilience research in adolescent populations is still limited. Even though they are included in the age group with high online risk, this result also opens opportunities for further researchers to examine digital resilience in adolescent populations.

3.4. The theoretical perspective used to explain the development of digital resilience

The results of the literature review revealed two theoretical perspectives used in digital resilience research in the last 5 years, namely, ecological theory (Hammond, et al., 2023, 2024; Lee & Hancock, 2023; Pan et al., 2024; Rodrigo et al., 2024; Sun et al., 2022) and Society Perspective 5.0 (Kurniadi et al., 2023). Therefore, existing research generally uses ecological theory.

3.4.1. Perspective of ecological theory

In digital resilience studies, ecological theory has been the theoretical perspective most commonly used by researchers in the last five years. For example, research conducted by a researcher from China explained that before digital resilience was formed in a person, there were conditions that triggered this happening (Webinar fatigue, the use of deviant technology, excessive use of online technology, risk of harassment and harassment, and the challenges of technological innovation in a virtual context) (Sun et al., 2022). The threat of digital technology is influenced by external factors (environment, content, services, policies, and support) and the internal factors of individuals (digital literacy and psychological resources to develop resilience to threats online and offline, including self-control, self-reflection, self-confidence, self-efficacy, self-esteem, and other psychological natures). When faced with online challenges, these factors illustrate the interaction between individuals and their environment at various levels, including individual, home, and community. Interaction at each level affects the development of digital resilience to support the realization of psychological well-being and optimal performance in individuals.

Other digital resilience research also uses ecological theory that explains the dimensions of digital resilience, including how to overcome online risk in the form of coping strategies, recovery from suppressing conditions, and learning from online risk experiences so that they can overcome the same thing if it occurs in the future. The three dimensions of digital resilience are directly related to several factors that play a protective role, namely, factors at the individual level (gender, age, and digital literacy), the family level (socioeconomic status, parental relations, and parental supervision), and the school level (anticitberbullying curriculum) (Pan et al., 2024).

The following study also uses a socioecological perspective so that the digital resilience-forming factor is focused on the individual, home, community, and community levels (Hammond, et al., 2024). The individual level includes age and self-regulation, the home level includes parental trust in children, and the community level includes hope for children. Therefore, for further research, we can consider using ecological theory as a perspective in the study of digital resilience.

3.4.2. Perspective of society 5.0

A digital resilience study was conducted in Indonesia from the Society 5.0 perspective, which refers to individual resilience to various risks that threaten Society 5.0 in the digital space (Setyawati et al., 2022), given the concept of Society 5.0 to describe the transformation of today's society into the digital era. Today, society utilizes digital technology to progress significantly in various aspects of life, including education. Technologies such as e-learning, AI-based learning, and virtual reality have enabled more comprehensive access to education and greater personalization. The activeness of Society 5.0 in the use of digital technology certainly requires society to have the ability to overcome the risks of using digital technology, which is called digital resilience. Digital resilience, referred to from this perspective, is the condition of individuals who can anticipate, recognize, and defend themselves from threats in the digital world. Digital resilience is greatly needed by Society 5.0, considering the increasing dangers and digital risks. Resilience is not a static trait but rather a dynamic process that involves positive adaptation in facing dangers and challenges in life, including risks when digital media is used. Therefore, this perspective emphasizes the characteristics of society that require the development of digital resilience. In contrast, the ecological perspective focuses on explaining the presence of predictors that shape individual digital resilience.

3.5. Model conceptual digital resilience

Among the 38 articles analyzed, only three presented a conceptual model, and 1 of them was empirically tested. The conceptual models of digital resilience formulated by previous studies have different models even though they use the same theoretical perspective, namely, ecological theory (Hammond, et al., 2024; Pan et al., 2024; Sun et al., 2022). The following is a description of the three conceptual models:

3.5.1. Conceptual model I

A study in 2022 explained that before digital resilience is formed in an individual, there are antecedents that precede it, including digital technology threats (webinar fatigue, deviant use of technology, excessive use of online technology, risks of harassment and bullying, and challenges of technological innovation in a virtual context). Internal and external factors influence technological threats. The external factors include the environment, content, services, policies, and social support, whereas the internal individual factors, including digital literacy and psychological resources to develop resilience to face online and offline world threats, include self-control, self-reflection, self-confidence, self-efficacy, self-esteem, and other psychological traits. The antecedents encourage the formation of digital resilience. After digital resilience is developed in a person, two favorable conditions appear that are experienced by the individual, namely, increased behavioral performance and psychological function (mental health and adjustment to a healthy lifestyle).

Furthermore, researchers can test this conceptual model of digital resilience and provide input for improving digital resilience steps and interventions. This study offers several recommendations for the application of the concept of digital resilience in the future, namely, 1) further research is expected to increase awareness that digital resilience grows through the use of online digital media and learning experiences so that it cannot be developed through avoiding the use of online digital

media; 2) empirical tests on the conceptual model of digital resilience that has been built in this study should be conducted; and 3) the cultural context must be recognized as an essential factor influencing individual digital resilience. (Sun et al., 2022). In addition to the findings of the digital resilience conceptual model, this study has limitations, namely, that the conceptual model that has been prepared has not been empirically tested, thus providing an opportunity for further researchers to test it.

3.5.2. Conceptual model II

Further research was conducted by Pan et al. (2024), who explained that the digital resilience model is closely related to digital resilience factors, such as recovery and learning from online risk experiences (Pan et al., 2024). Both factors play a protective role. In addition, the results of this study underline the importance of the relationship between digital literacy and parent–child relationships in encouraging individual recovery and learning from adverse online experiences, which ultimately contributes to personal well-being. On the other hand, a positive relationship between parental supervision and the use of unproductive coping strategies has an impact on the decline in individuals' psychological well-being. In addition, this study revealed a positive correlation between digital resilience and the use of cyberbullying education programs with digital literacy. The results of this study can serve as the basis for further researchers to re-examine the influence of protective factors, including individual and family factors, on individual digital resilience, especially among adolescents. This study is cross-sectional, so the generalizability of the results of this study is limited. Future research should consider longitudinal research to understand adolescent digital resilience comprehensively. This study also did not test the relationships between digital resilience and other psychological variables, such as self-regulation and emotional regulation, so further research is recommended to examine this relationship.

3.5.3 Conceptual model III

The latest research that formulated the digital resilience concept model was conducted by Hammond et al. in 2024. The results of this study revealed four major themes that are interrelated in explaining the concept of digital resilience (Hammond, et al., 2024). First, connected technology describes two conditions that can be experienced by individuals, namely, the use of connected technology as a learning medium for children. On the other hand, it can potentially cause children to use technology excessively. The existence of risky online experiences is the beginning of individuals being conditioned to develop their digital resilience, meaning that online experiences are at risk of obtaining the opportunity to create digital resilience. Digital resilience can be developed via both proactive and reactive mediation strategies. Nevertheless, proactive mediation strategies are not considered to support the development of individual digital resilience because this strategy tends to avoid the use of digital media connected to the internet. After all, adaptive functions are not stimulated without risk exposure. In addition, the development of digital resilience is influenced by risk factors and protective factors, two factors whose positions often change simultaneously. These factors include individual factors (age and self-regulation), home factors (parents' trust in children), and community and societal factors (expectations for children). However, this study also did not conduct empirical model testing.

The three conceptual models of digital resilience use theoretical perspectives, namely, ecological theory. Only the models formulated are different. Two of the three studies have not been empirically tested. The existence of a conceptual model that has not been tested provides an opportunity for future researchers to test digital resilience models, especially in a population that is still limited in its use in digital resilience research, namely, the adolescent group.

3.6. Study of digital resilience model construction in adolescents

Resilience is an individual's ability to overcome challenges, pressures, and difficulties in life, the study of which has been developed in various fields of science, such as psychology, sociology, education, and other social fields (Sun et al., 2022). The increasing study of resilience has contextualized the study of resilience at the individual, family, community, national, and cultural levels. The development of resilience studies at the individual level has penetrated the digital field. This finding is interesting because it is relevant to today's society, where individuals grow increasingly in a digital world (Przybylski et al., 2014). In almost all areas of life, technology supports individual activities such as socializing, seeking new knowledge and understanding, being creative, and even working in the digital world. The use of digital media connected to the internet has affected all aspects of life, meaning that humans and the digital world are increasingly connected (Anwar et al., 2024; UK Council for internet Safety, 2019). Previous researchers have studied the impact of internet-connected digital media use on individuals, and the results show that digital media can improve individual health in many ways. Nevertheless, online risk also overshadows individual digital activities (d'Haenens et al., 2013; Vandoninck et al., 2013). As a result, there are complaints in the form of webinar/online class fatigue, anxiety, difficulty controlling oneself, and not becoming addicted to accessing social media and entertainment platforms. Interestingly, many individuals adopt positive attitudes and behaviors to overcome existing risks, hoping that their psychological health will be maintained while using digital media. In this context, individuals have shown a new form of resilience in the digital context called digital resilience.

The discussion of digital resilience in this study focuses on digital resilience in psychology. Digital resilience involves dealing with negative experiences when digital media is used online. When digital media is used online, negative experiences

can be in the form of individuals experiencing cyberbullying, addiction to digital tools, or pressure to look perfect in social media, which threatens the psychological well-being of individuals (d'Haenens et al., 2013; Jannah & Setiyowati, 2024; Przybylski et al., 2014; Sun et al., 2022; Vandoninck et al., 2013; Vissenberg et al., 2022; Vissenberg & D'haenens, 2020; Wisniewski et al., 2015). These adverse experiences are also understood as online risks (Livingstone & Haddon, 2012). Events that cause feelings of pressure (stress) can contribute to the development of adequate digital resilience in individuals. When individuals learn to cope with (online) adversity, they develop digital resilience. Sun et al. (2022) also explained that digital resilience is shaped by experience, not just learning. Therefore, individuals with digital resilience have extensive experience using digital media in various aspects of life (Lee & Hancock, 2023; Wisniewski et al., 2016).

The discussion of digital resilience is directly related to the complex interactions among individual online experiences, psychological well-being, and the role of protective factors. However, despite the description of this interaction, several studies have been identified and require further investigation. One of the descriptions found is the absence of a consistent conceptualization of digital resilience, even a conceptualization model that still has minimal empirical evidence, thus encouraging the need for a study to understand the digital resilience concept model. The lack of testing of the existing digital resilience concept model is in line with the findings of this literature review, which concludes that only a small portion of digital resilience research uses quantitative research methods (Pan et al., 2024; Ragni et al., 2022). Therefore, there is an opportunity for further researchers to empirically test the contextual digital resilience model applied, especially to age groups that actively use internet-connected digital media in their daily activities. Most age groups that actively use internet-connected digital media are teenagers, so testing the conceptual model of digital resilience in teenagers is a separate need for this age group. Moreover, the results of this literature review indicate that few studies involving adolescent age groups have been conducted in previous digital resilience research. Existing digital resilience research has focused on children/elementary school students (Hammond, et al., 2023; Hammond, et al., 2023; Kaewseenual & Sittichai, 2021; Lee & Hancock, 2023; Meng et al., 2023) and adult/college student populations (Eri et al., 2021; Kurniadi et al., 2023; Ragni et al., 2022; Rodrigo et al., 2024; Shiraev & Levy, 2020; Zayed, 2024).

Although the digital resilience literature review concluded that studies on the adolescent population are still limited, it is essential to note that the adolescent population is the largest population in the world that actively uses digital media connected to the internet, so developing digital resilience in adolescents is undoubtedly an urgent matter for all parties to do (Hinduja & Patchin, 2017). Several studies emphasize the importance of developing digital resilience in adolescents (Anasuyari & Latifah, 2023; El-Asam et al., 2022; Hasanah & Latifah, 2021). Facilitating digital resilience in adolescents needs to be done as a collective effort that needs to be realized as a process. On the basis of the analysis of three studies that examine the digital resilience concept model, this study provides recommendations for further research to focus on conducting empirical tests of the digital resilience concept model formulated by Sun et al. (2022) from a socioecological theory perspective. From the perspective of socioecological theory, individual digital resilience can be formed by activating 3 levels of the environment, namely, the personal level, the home level, and the community level. In the concept model built by Sun et al., digital resilience is developed after individuals are in an active condition using online digital media that is vulnerable to online risk and is influenced by internal factors (digital literacy and emotional regulation, including the individual level) and external factors (parental care, including the home level, and the quality of friendship, including the community level).

5. Conclusion

Digital resilience is the ability to protect oneself and recover from negative experiences via digital media online. Risk and digital resilience go hand in hand because digital resilience can only develop through exposure to risks or events that directly intersect with stressful online activities, as explained in the concept of resilience. When individuals learn to cope with difficulties (online), they develop digital resilience. The existing research generally examines digital resilience in child, adult, and minority groups. The adolescent population is vulnerable to online risk and urgently needs further study. The perspective commonly used in digital resilience research is the ecological perspective. The development of digital resilience in adolescents requires close interaction among the individual, family, community, and social levels. These four levels can be sources of protective factors for the development of adolescent digital resilience. With respect to the digital resilience of adolescents, further researchers need to consider protective factors that support digital resilience, such as parental care, the quality of friendships, and the ability to control emotions. In addition, adolescents' understanding of and ability to utilize digital media online can also further strengthen the influence of protective factors in the development of adequate digital resilience in adolescents. The implications of this study refer to the importance of developing digital resilience in adolescents by referring to the perspective of ecological theory in adolescent populations.

Ethical Considerations

Not applicable.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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