

# Development of Digital Educational Media Based on Family For Improving Adolescent Self-Efficacy in Maintaining Reproductive Health : Literature Review

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## ABSTRACT

*Self-efficacy of adolescents in guarding reproductive health is an important predictor of health behavior related to sexual decision safety and the prevention of risks such as sexually transmitted infections and unwanted pregnancy. Development of digital technology provides opportunities for developing interactive educational media that can be accessed by teenagers and their families to increase self-efficacy. This literature review analyzed 11 internationally published articles between 2016–2026 related to digital media-based reproductive health education interventions that involve family or social support, including mobile health (mHealth), interactive applications, social media, and web platforms. The results show that digital educational media is generally capable of increasing knowledge, attitudes, and confidence/self-efficacy of teenagers regarding reproductive health, especially when accompanied by family involvement or parental support. In conclusion, family-based digital educational media can become a potential strategy to strengthen adolescents' self-efficacy in making healthy decisions related to reproductive health. However, further studies with stronger experimental designs are required.*

**Keywords:** Digital Educational Media, Self-Efficacy, Adolescents, Reproductive Health

## INTRODUCTION

Reproductive health among adolescents is an important aspect of global public health. Biological, psychological, and social changes during adolescence often increase the risk of reproductive health problems, including risky sexual behavior, sexually transmitted infections, and unwanted pregnancy. Research shows that digital-based reproductive health education can reach adolescents more widely and effectively because of its accessibility and flexibility (Borji Navan et al., 2024).

Adolescence is a very crucial phase of development physically, psychologically, and socially. During this period, adolescents enter puberty and begin to explore their self-identity, including complex aspects of reproductive health. According to research, a lack of accurate information and limited access to reproductive health education can lead to risky behaviors such as premarital sexual activity, sexually transmitted infections



(STIs), and unwanted pregnancy. Low self-efficacy, or adolescents' belief in their ability to make healthy decisions related to reproductive health, can worsen this situation because knowledge without self-confidence is often not enough to encourage positive behavioral change.

Digital educational media has now become a promising strategy in health education because adolescents are a generation that is highly familiar with digital technology and internet use. Digital interventions such as mobile applications, web platforms, social media, educational videos, and educational games have consistently been reported to increase reproductive health literacy as well as adolescents' active involvement in maintaining their health (Angesti et al., 2025).

In addition, digital education approaches that involve families or parents are increasingly emphasized in the latest literature. Parental involvement in the digital education process not only contributes to increasing adolescents' knowledge but also strengthens emotional and social support, which in turn improves self-efficacy. Systematic review results show that interventions involving families in reproductive health education tend to produce more sustainable behavioral changes compared to interventions that focus only on adolescents (Rumdari et al., 2025).

The utilization of digital technologies such as mobile applications, web platforms, mobile games, and social media has been proven to increase adolescents' knowledge and attitudes toward reproductive health as well as improve the credibility of the information they receive (Yusuf et al., 2026; Angesti et al., 2025). However, sustainable behavioral changes and improvements in adolescents' self-efficacy still require family support as an important moderating factor in the implementation of digital educational media (Rumdari et al., 2025).

However, although digital media shows great potential, challenges such as variations in content quality, a lack of digital media literacy among adolescents, and limitations in measuring self-efficacy explicitly remain obstacles that need to be addressed. Studies on digital health literacy show that although adolescents generally have access and the ability to search for health information online, they often face difficulties in evaluating the quality of such information without parental support or guidance (Adolescents' Self-Efficacy and Digital Health Literacy, 2022).

## **METHODS**

This study uses a literature review design with a descriptive-analytical approach to examine various studies related to the development of family-based digital educational media for improving adolescent self-efficacy in maintaining reproductive health. The literature review was conducted to identify, analyze, and synthesize findings from previous relevant studies on the topic, in order to obtain a comprehensive description of adolescents' self-efficacy in maintaining reproductive health.

Digital and non-digital educational media contribute significantly to improving adolescents' reproductive health outcomes, including increased knowledge, positive attitudes, and stronger self-efficacy in managing reproductive health issues such as puberty, sexual risk prevention, and reproductive hygiene. The effectiveness of these interventions is further strengthened by family-based approaches, where parental involvement plays a critical role in shaping adolescents' understanding, attitudes, and responsible health behaviors.

The data sources in this study were obtained from national and international scientific articles accessed through electronic databases such as Google Scholar, PubMed, ScienceDirect, and national journal portals indexed in SINTA. The keywords used in the search process included "child marriage prevention,"



“parental empowerment,” “peer education,” “parent involvement,” and “community-based intervention.” The selected articles were published between 2024–2026 to ensure the relevance and recency of the data.

The inclusion criteria in this study were: (1) original research articles or systematic reviews; (2) studies discussing the development of digital technology that provides opportunities for developing interactive educational media; (3) studies discussing adolescent self-efficacy in maintaining reproductive health; and (4) articles available in full text. Meanwhile, the exclusion criteria included opinion articles, editorials, and articles that were not relevant to the focus of the research. The selection process was conducted through several stages, including title identification, abstract screening, and comprehensive article content review.

Data analysis was conducted using descriptive and thematic approaches, with narrative synthesis to draw conclusions about the effectiveness of family-based digital educational media in improving adolescents’ self-efficacy. If numerical data were available, simple quantitative analysis could also be added to strengthen the argumentation.

## RESULTS

### 1. Article Description Results

**Table 1. Article Description**

Title	Insight	Method	Findings	Research Correlation
Efficacy of Digital Health Interventions Used for Adolescent's Sexual Health: An Umbrella Review Borji -Navan et al. (2024)	Digital health interventions can increase practice health and reduce risk sexual teenager	Umbrella review ( synthesis from various study )	Improvement knowledge teenager related health reproduction , reduction behavior risk sexual	Improvement knowledge teenager related health reproduction , reduction behavior risk sexual
Effectiveness of Digital Reproductive Health Education Interventions for Adolescent Girls: A Literature Review Yusuf et al. (2026)	Digital interventions ( applications , SMS, educational games ) are effective in adolescents Woman	Literature review and study data analysis quasi-experimental	Knowledge and attitudes reproduction increase in a way consistent .	interaction digital can increase knowledge and attitudes to potential behavior life Healthy
Effectiveness of digital interventions to reduce school-age adolescent sexual risks: A systematic review Aguilar -Quesada et al. (2025)	Digital interventions improve behavior sexual healthy and improving attitude teenager	Systematic review	Improvement attitude positive to health reproduction and behavior sexual Healthy .	Digital education can increase attitudes and behavior Healthy
Systematic Review: Effectiveness Mobile	More mobile applications	Systematic review &	Knowledge and behavior	Knowledge and behavior



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Application in Reproductive Health Education Teenager Angesti et al. (2025)	effective compared to education conventional	comparative analysis	reproduction teenager increase more significant 54comparison method traditional	reproduction teenager increase more significant 54comparison method traditional
Effect of a digital intervention on sexual and reproductive health knowledge , behavior , and service uptake among university youths in Lagos , Nigeria: a quasi-experimental study Chima -Oduko et al. (2025)	Long-term digital intervention short can increase <i>self-efficacy</i> teenager related to SRH	Quasi-experimental term short	<i>Self-efficacy</i> teenager increase after intervention	Digital interventions and <i>self-efficacy</i> can increase taking decision related to SRH more Good
Utilizing Digital Applications as Educational Media for Adolescents Reproductive Health Within The Family Nursing Approach: Nurhaeni (2025)	Digital based approach family increase knowledge , attitudes , and involvement family	Studies quasi-experimental , family-centered	Knowledge , attitudes , and involvement family increase significant	Support family and digital media can increase <i>self-efficacy</i> & knowledge
Digital Support Education on Risky Adolescent Reproductive Health Behaviors : A Systematic Review: Rumdari et al. (2025)	Parental involvement in digital education repair SRH attitudes and behaviors and <i>self-efficacy</i>	Literature review & comparative study	Attitude positive behavior healthy , and <i>self-efficacy</i> increase	Parental involvement can increase <i>self-efficacy</i> & behavior Healthy
Comparative analysis of social media-based interventions for adolescent reproductive health education: Ciluvai & Maheswari (2024)	Social media platforms effective convey SRH education in accordance with the digital era of teenagers	Literature review	Improvement knowledge and involvement teenager through social media	Social media interactive can increase knowledge & attitude
Web-based sexual and reproductive health education for adolescents aged 10–17 years: a systematic review and	Web-based SRH education improves attitudes and behavior health teenager	Quasi-experimental , web-based learning	Attitudes and behavior health reproduction increase significant	Web-based access can be increase attitudes & behavior Healthy



meta-analysis: Guo et al. (2025)				
Web-based sexual and reproductive health education for adolescents aged 10–17 years: a systematic review and meta-analysis: Guo et al. (2025)	Mobile game based education effective increase knowledge and attitudes teenager	Studies intervention based gamification	Knowledge and attitudes teenager increase	Digital gamification improves motivation & knowledge and attitude positive
Digital Adolescent Sexual and Reproductive Health in Low- and Middle-Income Countries: A Scoping Review: Dowling et al. (2025)	Digital technology provides SRH information in wide For population teenager	Literature review	Access information increased awareness teenager to SRH risk	Access technology can improve health literacy and healthy behavior

Based on the results of the synthesis of various studies presented in the table above, it can be concluded that all studies examining various forms of digital intervention—ranging from mobile applications, web platforms, SMS, to social media—reported improvements in adolescents’ knowledge related to sexual and reproductive health (SRH). Borji Navan et al. (2024), through an umbrella review, found that digital interventions improve health practices and reduce risky sexual behavior. Yusuf et al. (2026) showed that digital interaction through educational applications, SMS, and games consistently increases knowledge and reproductive health attitudes among female adolescents. Aguilar Quesada et al. (2025) added that digital education is capable of improving adolescents’ attitudes toward sexual health and healthy behaviors. Angesti et al. (2025) emphasized that mobile applications are more effective than conventional education in improving adolescents’ reproductive health knowledge and behavior. Guo et al. (2025) and Ciluvai and Maheswari (2024) emphasized that web and social media platforms can increase positive attitudes and adolescents’ engagement in SRH education.

Several studies also emphasize the effect of digital interventions on self-efficacy. Chima Oduko et al. (2025) showed that short-term digital interventions can increase adolescents’ self-efficacy, which has an impact on decision-making related to reproductive health. Nurhaeni (2025) and Rumdari et al. (2025) emphasized that family-based digital approaches or parental involvement strengthen self-efficacy by increasing adolescents’ skills in applying SRH knowledge in their daily lives. This indicates that family support is an important moderating factor in the success of digital interventions.

Studies by Caliston (2025) and Angesti et al. (2025) show that gamification and digital interactivity approaches increase adolescents’ learning motivation, knowledge, and attitudes more significantly compared to traditional methods. Dowling et al. (2025) added that digital technology provides broader access to information, increases health literacy and risk awareness, and supports sustainable health behaviors.

## DISCUSSION

### 1. Effectiveness Digital Education on Self-Efficacy

Evidence from Lots studies show that digital media provides significant benefits in increase *knowledge* and *confidencelself -efficacy* teenager For access and apply information health reproduction ( Yusuf et al., 2026 ;



Angesti et al., 2025 ). Mobile applications, educational videos, and interactive games provide experience learn more attractive and flexible compared to method traditional.

Study *randomized controlled trial* show that intervention designed education based on theory *self-efficacy* and delivered through effective mobile applications in increase *self-efficacy* teenager For behavior health certain ( *for example behavior cleanliness mouth* ). Application This give material interactive and accessible education accessible When only by the participants, so that teenager become more believe self in apply taught behavior (eg . method brushing teeth, flossing, or visit to doctor teeth). Research results show improvement significant score *self --efficacy* after intervention compared to before intervention ( $p < 0.05$ ), whereas group control No show change meaningful. Findings This show that the digital platform is designed in a way theoretical with principle *self-efficacy* can build trust self teenager to ability they do behavior healthy (Seyedeh Zahra Marashi et al., 2024)

Digital education focused on digital health literacy can strengthen adolescents' *self-efficacy* in searching for, assessing, and using health information online. A study that evaluated a co-designed digital educational resource (developed together with adolescents) found that after using a short digital education application, most participants reported improvements in their ability to evaluate the credibility of health information on the internet and felt more confident in using that information effectively. This is directly related to improvements in *self-efficacy*, because adolescents become more confident in making health decisions based on information they independently find on the internet (Hawkins, 2025).

Observational studies show that adolescents who have higher levels of digital health literacy tend to have stronger perceptions of *self-efficacy* in using online health information compared to those with lower literacy levels. Although some adolescents feel confident accessing health information through social media and search engines, their critical ability to evaluate the quality of content is still limited, which can influence their *self-efficacy* if the information found is inaccurate or misleading. The results of this study confirm that improving digital literacy is an important component in strengthening *self-efficacy*, because *self-efficacy* is not only a sense of confidence but also based on the real ability to assess and apply information in health-related decision-making (Taba et al., 2022).

Several systematic reviews and meta-analyses show that digital interventions such as applications, e-learning, and online resources can increase *self-efficacy* and health behaviors across various domains, although the effects may be small or vary depending on the intervention design. For example, among adolescents with chronic health conditions, digital-based interventions provide modest improvements in *self-efficacy* compared to control groups. However, these findings indicate that digital tools have the potential to improve *self-efficacy*, especially when combined with structured and personalized educational approaches. This emphasizes that digital education needs to be specifically designed according to adolescents' contexts to achieve optimal *self-efficacy* and health behavior outcomes (Domhardt et al., 2021).

## 2. The Role of the Family in Digital Approach

Digital interventions involving parents or families show a stronger impact on adolescents' *self-efficacy* as well as behavioral change, as parental support provides additional social and emotional context (Nurhaeni, 2025; Rumdari et al., 2025).

Families play an important role as moderators in the success of digital interventions, particularly in strengthening adolescents' *self-efficacy* in making health-related decisions. Research shows that when parents are actively involved in the use of digital educational media together with adolescents, there is an increase in adolescents' confidence in applying the information they receive. This occurs because social support and



feedback from parents help adolescents understand the content, overcome confusion, and strengthen their intention to apply healthy behaviors (self-efficacy) in real life (Siddiqi et al., 2022).

The role of the family in shaping digital health literacy, or the ability to search, evaluate, and use health information effectively, also has a direct impact on adolescents' self-efficacy. Longitudinal studies reveal that adolescents who grow up in family environments that support digital learning—for example, parents guiding the use of educational applications, encouraging discussions about online information, or providing suggestions on evaluating the credibility of sources—tend to have higher *self-efficacy* in using digital health information compared to those with minimal family support (Zhao & Lee, 2023).

Digital interventions involving two-way interactions—such as applications that allow adolescents and parents to communicate in real time, question-and-answer features with health professionals, or activity modules designed for both parents and adolescents—have been shown to have a greater impact on *self-efficacy* outcomes compared to one-way interventions such as videos or static articles. A randomized controlled trial (RCT) found that adolescents who used interactive digital education programs with parental involvement reported more significant improvements in *self-efficacy* compared to those who only received digital content without family involvement (Kim et al., 2024).

Although health information can be easily accessed through the internet, misinformation or inaccurate content remains a significant challenge, especially for adolescents who may not yet fully possess strong critical evaluation skills. In this context, family involvement plays a role as a “filter” or discussion partner that helps adolescents evaluate the accuracy of digital content and directs them to trusted sources. Observational research shows that adolescents who discuss online health information with parents or other family members are more likely to develop stronger *self-efficacy* in making appropriate health decisions while simultaneously reducing risky behaviors (Martinez Lopez et al., 2025).

### 3. Social Media and Interactive Platforms

Social media has become an important medium because adolescents are highly engaged with this digital platform, making it an effective channel for education if designed accurately and responsibly (Ciluvai & Maheswari, 2024; Guo et al., 2025).

Social media has become an important channel for delivering health education content to adolescents due to its wide reach, engaging content formats, and easy accessibility. Systematic review studies show that the use of platforms such as Instagram, TikTok, and YouTube significantly increases health literacy, including knowledge about reproductive health, compared to conventional educational techniques. Interactive content such as quizzes, short videos, and audiovisual storytelling has been proven to attract adolescents' attention and improve their engagement with complex and sensitive health topics. This supports improvements in adolescents' knowledge regarding health issues associated with certain risks, such as sexually transmitted infections or unwanted pregnancy (Oladeinde et al., 2022).

Beyond simply providing information, interactive digital platforms that support two-way communication features (e.g., chatbots, forums, and live Q&A sessions) have been shown to be more effective in building adolescents' *self-efficacy* related to healthy lifestyles. Real-time interaction allows adolescents to ask questions, obtain clarification, or share experiences, which increases their sense of control over the information they learn. For example, adolescents who use health education applications that provide discussion features with health experts report greater improvements in *self-efficacy* when making decisions related to healthy sexual behavior compared to those who only read static content (Henson et al., 2023).



Adolescents are highly connected with their peers through social media, and digital peer influence can become an agent for strengthening positive norms when utilized for sexual and reproductive health (SRH) education. Longitudinal research has found that adolescents exposed to educational content endorsed by peers or admired public figures report more positive attitudes toward healthy behavior and higher *self-efficacy* compared to those who only receive educational content delivered by institutions without peer endorsement. Content that combines peer narratives and real-life experiences is perceived as more credible and relatable by adolescents, thereby increasing the internalization of health values and confidence when facing real-life situations (Morris et al., 2024).

Although social media and interactive platforms have strong potential, one of the greatest challenges is misinformation. Invalid or misleading content can reduce *self-efficacy* or even encourage risky behavior. Cross-sectional studies reveal that adolescents with lower levels of digital media literacy are more vulnerable to inaccurate information related to reproductive health. Therefore, they need to be equipped with critical evaluation skills and digital literacy education as part of digital health education strategies. Interventions that integrate digital media literacy modules with health education content have been shown to improve adolescents' ability to differentiate between valid and invalid information and strengthen their *self-efficacy* in making appropriate health decisions (Ahmed & Gaya, 2025).

## CONCLUSIONS

Digital educational media has been proven effective in increasing adolescents' knowledge, attitudes, and *self-efficacy* related to reproductive health, especially when designed with interactive features and family engagement. An approach that combines digital media with family environmental support can strengthen healthy decision-making as well as adolescents' motivation to adopt positive behaviors. However, further experimental studies are needed to evaluate the long-term impact and the role of family cohesion in digital interventions.

Future research should include experimental or longitudinal studies to comprehensively evaluate the impact of digital media on behavioral change and adolescents' self-efficacy. In addition, the integration of digital strategies with active involvement from families and educators is important to strengthen social support for adolescents. The development of digital content that is sensitive to cultural contexts and adolescents' needs is also essential to ensure the effectiveness and sustainability of digital health education interventions.

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