

An Effective E-Module to Support Decision-Making in Selecting Contraceptive Methods

Wahyu¹, Sri Rejeki¹, Machmudah¹

¹Master of Nursing Study Program, Universitas Muhammadiyah Semarang (UNIMUS), Semarang, Indonesia

Correspondence: **Wahyu**; Jl. Kedungmundu Raya 18, Tembalang, Kota Semarang; wahyupraditya99@yahoo.co.id

ABSTRACT

Unintended pregnancy and inappropriate contraceptive use remain significant public health challenges among women of reproductive age. Limited access to accurate contraceptive information and inadequate counseling may hinder informed decision-making. With the rapid advancement of digital health technologies, e-module-based contraceptive education has emerged as a promising strategy to strengthen women's knowledge and support informed contraceptive choices. This systematic review aimed to examine the effectiveness of e-module-based contraceptive education in supporting informed contraceptive decision-making among women of reproductive age. A systematic review was conducted following PRISMA guidelines. Searches were performed in PubMed, ScienceDirect, ProQuest, and Google Scholar. Eligible studies included original quantitative or mixed-method research involving women of reproductive age, using e-module or digital contraceptive education interventions, and reporting outcomes related to decision-making, knowledge, attitudes, or contraceptive choice. Data were synthesized narratively. Across the included studies, e-module-based contraceptive education consistently demonstrated positive effects on multiple dimensions of informed decision-making. Most interventions significantly improved participants' contraceptive knowledge, including understanding of method effectiveness, side effects, and correct use. Several studies reported enhanced attitudes toward contraceptive planning, greater confidence in evaluating available options, and increased readiness to engage in shared decision-making with healthcare providers. Digital modules also contributed to reductions in decisional conflict, particularly by clarifying personal values and aligning contraceptive choices with individual preferences and reproductive goals. In some studies, women expressed higher satisfaction with digital learning formats due to their flexibility, privacy, and ease of access. Overall, digital contraceptive education showed comparable or superior effectiveness to conventional counseling, especially in improving comprehension and supporting autonomous decision-making. In conclusion, E-module-based contraceptive education effectively strengthens informed contraceptive decision-making among women of reproductive age. Integrating digital modules into nursing practice and family planning services may enhance patient-centered care. Further high-quality studies are needed to assess long-term outcomes.

Keywords: contraception; decision making; digital health; reproductive health; women

INTRODUCTION

Strategic issues in health development include efforts to strengthen family planning programs, particularly for women of reproductive age. Selecting an appropriate contraceptive method not only determines the success of family planning initiatives but also affects women's physical, psychological, and social well-being. However, contraceptive decision-making is frequently hindered by limited knowledge, persistent myths, and inadequate access to comprehensive and easily understood information [1,2].

Contraceptive education plays a crucial role in improving women's knowledge and attitudes toward available contraceptive options. Adequate information enables women to make rational decisions that align with their personal needs and health conditions. Evidence shows that low levels of contraceptive knowledge are associated with inappropriate method selection, inconsistent use, and high discontinuation rates [3,4]. Therefore, improving the quality of contraceptive education is essential for strengthening family planning outcomes.

Globally, contraceptive use is one of the most effective public health interventions for improving reproductive health and preventing unintended pregnancies. According to the World Health Organization (WHO), among approximately 1.9 billion women aged 15–49 years, 1.1 billion require family planning services, yet around 164 million still have an unmet need for contraception. Access to high-quality contraceptive information and services is a fundamental reproductive right that enables individuals to freely and responsibly determine the number and spacing of their children. Appropriate contraceptive use also reduces the risk of unintended pregnancy, pregnancy complications, and maternal mortality [5].

Despite the availability of diverse contraceptive methods, many women continue to face challenges in selecting options that best suit their health conditions, lifestyle, and reproductive preferences. WHO emphasizes that informed contraceptive choice is a core component of patient-centered family planning services. Insufficient support during the decision-making process may lead to inappropriate method selection, dissatisfaction, inconsistent use, or premature discontinuation. A systematic review has shown that women consider multiple factors when choosing contraception, including effectiveness, side effects, health risks, ease of use, and compatibility with personal circumstances. This underscores the need for comprehensive educational support to facilitate informed decision-making [6].

The urgency of this issue is heightened by persistently high rates of unintended pregnancy worldwide. WHO reports that millions of women experience unintended pregnancies each year, largely due to disparities in access to high-quality family planning information and services. Misunderstanding of contraceptive options, concerns about side effects, and suboptimal counseling often contribute to discontinuation or non-use of contraception [7].

Advances in information technology have transformed health education approaches, including the use of digital learning modules or e-modules. E-modules are systematically designed, interactive digital learning media that allow users to access educational content flexibly according to their needs and schedules. Their use in health education has been shown to increase participant engagement, improve comprehension, and support independent learning [8,9].

In reproductive health, digital contraceptive education—including e-modules—has the potential to enhance women's understanding of contraceptive types, benefits, risks, and side effects. Several studies report that technology-based educational interventions can improve contraceptive knowledge and decision-making more effectively than conventional methods [10,11]. However, findings across studies remain varied due to differences in study design, population characteristics, and intervention types.

Digital technology thus presents new opportunities to expand access to contraceptive education. Innovations such as e-modules enable users to obtain information independently, flexibly, interactively, and at any time. Evidence indicates that digital tools and technology-based decision aids can improve knowledge, self-efficacy, contraceptive use, and continuation rates. Some studies even suggest that digital media can provide decision-making support comparable to or better than traditional educational approaches [12].

Given these developments, a systematic review is needed to comprehensively examine the influence of e-module-based contraceptive education on decision-making among women of reproductive age. Such a review can synthesize existing scientific evidence, identify research gaps, and inform the development of effective and sustainable digital contraceptive education strategies within reproductive health services [13].

Nevertheless, current evidence on the effectiveness of e-modules in supporting contraceptive decision-making remains fragmented across studies with diverse designs, populations, and outcome measures. Some studies focus on knowledge improvement, while others evaluate changes in attitudes, decisional conflict, user satisfaction, or contraceptive method choice. This heterogeneity complicates efforts to draw comprehensive conclusions regarding the effectiveness of e-modules as an educational strategy. Therefore, a systematic literature review is required to identify, evaluate, and synthesize available evidence on the effectiveness of e-modules in supporting contraceptive decision-making among women of reproductive age. The findings are expected to guide the development of more effective digital educational interventions, support evidence-based nursing practice, and enhance the quality of patient-centered family planning services.

METHODS

This systematic review was conducted from January to February 2026 following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The review process consisted of literature searching, study selection, quality appraisal, data extraction, and narrative synthesis. A comprehensive literature search was conducted between January and February 2026 using three electronic databases: PubMed, ProQuest, and Google Scholar. The search strategy was developed using Medical Subject Headings (MeSH) and relevant keywords, including “contraceptive education,” “e-module,” “digital health education,” “decision making,” and “women of reproductive age.” Boolean operators (AND, OR) were applied to combine search terms according to the requirements of each database. nStudies published in English or Indonesian within the last ten years (2016–2025) were considered eligible to ensure the relevance and recency of evidence.

The inclusion criteria were: (1) original research articles with quantitative, qualitative, or mixed-method designs; (2) participants were women of reproductive age (15–49 years); (3) interventions involved e-module-based contraceptive education or similar digital educational media; (4) outcomes included contraceptive decision-making, knowledge, attitudes, satisfaction, decisional conflict, or contraceptive choice; (5) articles were published in English or Indonesian; and (6) full-text articles were available. The exclusion criteria were: (1) review articles, editorials, commentaries, conference proceedings, and case reports without empirical data; (2) studies that did not specifically evaluate contraceptive education or digital educational interventions; (3) studies involving populations other than women of reproductive age; (4) articles with incomplete data; and (5) duplicate publications. The study selection process is presented in the PRISMA flow diagram (Figure 1). A total of 98 records were identified through database searching, comprising PubMed (n = 9), ProQuest (n = 81), and Google Scholar (n = 8). After removing one duplicate record and two records identified as ineligible through automated screening, 97 records remained for title and abstract screening.

During the screening phase, 91 records were excluded because they did not meet the eligibility criteria. Six full-text articles were retrieved and assessed for eligibility. Following full-text review, two articles were excluded because their outcomes did not correspond to the review objectives. Consequently, four studies met all eligibility criteria and were included in the final review. The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist according to the respective study design. Quality appraisal was conducted to evaluate the risk of bias and methodological rigor of each study before inclusion in the final synthesis. Data were extracted using a standardized extraction form, including author, publication year, country, study design, sample characteristics, intervention characteristics, outcome measures, and key findings. Due to the heterogeneity of study designs and outcome measurements, a narrative synthesis approach was employed. Findings from the included studies were compared and synthesized to identify patterns regarding the effectiveness of e-module-based contraceptive education in improving knowledge, attitudes, and contraceptive decision-making among women of reproductive age.

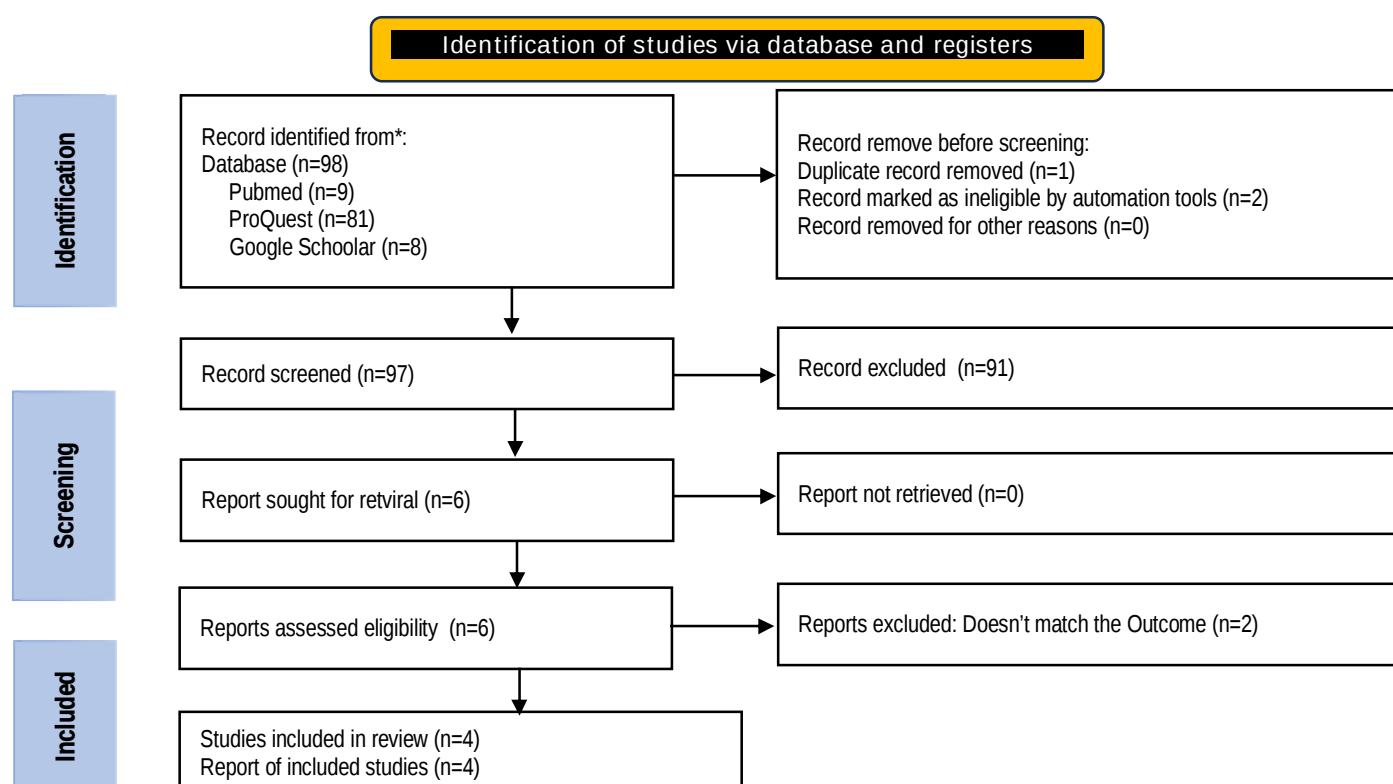


Figure 1. PRISMA diagram in the article selection process

RESULTS

Full-text eligibility assessment was conducted on the six retrieved reports. At this stage, two studies were excluded because their reported outcomes did not align with the predefined inclusion criteria, particularly in relation to contraceptive decision-making or digital-based contraceptive education. Finally, four studies met all inclusion criteria and were included in the systematic review. These studies were subsequently analyzed and synthesized to evaluate the effect of e-module-based contraceptive education on contraceptive decision-making among women of reproductive age.

Table 1. Summary of the results of the synthesis of selected literature

Authors	Methods	Population	Intervention	Results
Kus LH, Paul R, Nigaglioni Rivera A, Zeal C, Madden T, 2023 [14]	Pra-experimental (pre-post study)	789 Women of reproductive age	Online/web-based contraceptive education	There was a significant increase in contraceptive knowledge scores after using online educational resources.
Zeal C, Paul R, Dorsey M, Politi MC, Madden T, 2022 [15]	Mixed-methods	41 Young reproductive age women	Development and use of online contraceptive educational resources	Online-based education is considered easier to access and increases understanding and decision-making readiness.
Aryvia NS, Hestiyana N, Mahdiyah D, Lathifah N, 2025 [16]	Quasi-experimental	30 Women of childbearing age (15–49 years)	Contraception education mobile application (<i>Klik KB</i>)	Significant increase in contraceptive knowledge after using the <i>Klik KB</i> application
Dehlendorf C, Fitzpatrick J, Fox E, Holt K, Vittinghoff E, Reed R, et al, 2019 [11]	Randomized Controlled Trial	758 Women of reproductive age	Decision aid digital contraception	Digital interventions improve the quality of informed decision making and the appropriateness of contraceptive choices.

Four studies met the eligibility criteria and were included in this systematic review. The studies were published between 2019 and 2025 and originated from different settings, reflecting the growing interest in digital contraceptive education across various populations of women of reproductive age. Regarding study design, methodological approaches varied among the included studies. One study employed a randomized controlled trial design, one used a quasi-experimental approach, one applied a pre-experimental design, and one utilized a mixed-methods approach. This variation provided evidence from both experimental and exploratory perspectives regarding the effectiveness of digital contraceptive education interventions.

The study populations ranged from 30 to 789 participants. Three studies involved women of reproductive age in general, while one study specifically focused on young women. Despite differences in sample size and participant characteristics, all studies examined populations that were potential users of contraceptive services and therefore relevant to the review objective. The interventions also demonstrated some variation. Two studies evaluated web-based contraceptive education platforms, one study assessed a mobile application-based contraceptive education program (*Klik KB*), and one study examined a digital contraceptive decision aid. Although the delivery methods differed, all interventions shared the common objective of improving access to contraceptive information and supporting informed decision-making through digital technology.

Across all included studies, the findings consistently indicated positive effects of digital contraceptive education. Improvements were reported in contraceptive knowledge, understanding of available contraceptive methods, readiness for decision-making, and the quality of informed contraceptive choices. Studies evaluating web-based educational resources found significant increases in contraceptive knowledge and participants' ability to understand contraceptive options. Similarly, the mobile application intervention demonstrated improved knowledge scores following exposure to digital educational content. The randomized controlled trial further showed that digital decision-support tools enhanced informed decision-making and increased the appropriateness of contraceptive choices.

Overall, despite differences in study design, sample size, and intervention format, the evidence consistently suggests that e-module-based and other digital contraceptive education interventions contribute positively to knowledge acquisition and informed contraceptive decision-making among women of reproductive age.

DISCUSSION

A synthesis of the results from the studies summarized in the summary table shows that digital-based contraceptive education, including e-modules, online educational resources, and mobile applications, consistently has a positive impact on contraceptive knowledge and decision-making among women of childbearing age. Despite varying study designs, ranging from pre-experimental to randomized controlled trials, all studies show similar results: improved understanding and decision-making quality following digital-based educational interventions.

Pre-experimental studies conducted by Kus et al. (2023) [14] and Aryvia et al. (2025) show that the use of digital educational media significantly improves contraceptive knowledge. This increase in knowledge reflects the effectiveness of digital media in conveying complex information in a more structured and easily understood manner. Adequate knowledge is a key factor in supporting informed decision-making, particularly in selecting contraceptive methods that suit a woman's needs and health conditions [17].

Findings from a mixed-methods study (2022) reinforce these results by showing that women of childbearing age have a strong preference for online-based contraceptive education. Digital media is considered more flexible, more accessible, and offers a greater sense of privacy than conventional educational methods. This high acceptance of digital media has the potential to increase user engagement in the educational process, ultimately positively impacting understanding and readiness to make contraceptive decisions.

Methodologically sound evidence is provided by a randomized controlled trial by Dehlendorf et al. (2019) [11], which reported that the use of a digital contraceptive decision aid not only improved knowledge but also enhanced the quality of decision-making and the appropriateness of contraceptive method choice according to individual preferences. These findings confirm that patient-centered digital interventions can empower women as primary decision-makers in their reproductive health.

The results of a systematic review by Bailey et al. (2010) [10] provide additional support, concluding that computer-based and digital reproductive health education interventions are more effective than conventional education in improving knowledge and attitudes. The consistency of findings across studies suggests that the use of digital technology in contraceptive education has a strong evidence base and is relevant to the development of modern healthcare. However, there are limitations that should be considered. Variations in study designs, sample sizes that are

not always reported in detail, and differences in measurement instruments indicate methodological heterogeneity. These conditions limit the ability to conduct quantitative comparisons or meta-analyses. Therefore, the results of this review are best interpreted as a narrative synthesis.

Several systematic reviews demonstrate that electronic interventions, including interactive applications and web-based tools, improve contraceptive knowledge and related attitudes, and may support informed decision-making among reproductive-age women. Educational interventions, whether delivered via print, audio-visual, or digital formats, have been consistently shown to increase contraceptive knowledge and participation in decision processes, highlighting the importance of tailored communication strategies in family planning services [18].

Advancing equitable family planning requires education, improved access, peer influence, and the active participation of husbands and male partners. Comprehensive programs should bridge the gap between knowledge and action, reduce disparities, and ensure equal access to contraception. Context-specific research and rigorous evaluation of interventions are crucial steps toward achieving global reproductive health objectives [19].

Technology-based contraceptive decision aids further enhance self-efficacy and alignment of contraceptive choice with individual preferences, reinforcing the potential of digital education tools to complement traditional counseling [20]. However, there are limitations that should be considered. Variations in study designs, sample sizes that are not always reported in detail, and differences in measurement instruments indicate methodological heterogeneity. These conditions limit the ability to conduct quantitative comparisons or meta-analyses. Therefore, the results of this review are best interpreted as a narrative synthesis [13].

This systematic review contributes to global nursing practice by providing evidence that digital-based contraceptive education, particularly e-modules, is an effective nursing intervention to support informed contraceptive decision-making among women of reproductive age. The findings highlight the expanding role of nurses as educators and facilitators of digital health interventions in reproductive health services. By integrating e-module-based education into nursing practice, nurses can enhance patient-centered counseling, improve health literacy, and promote autonomous decision-making across diverse healthcare settings. Furthermore, this review supports the adoption of digital education strategies to improve access, equity, and continuity of family planning education, especially in resource-limited or geographically remote areas. The evidence presented can inform nursing education, clinical guidelines, and policy development aimed at strengthening reproductive health outcomes globally.

The findings of this systematic review indicate that e-module-based contraceptive education has a positive impact on contraceptive knowledge and informed decision-making among women of reproductive age. Across all included studies, digital educational interventions consistently improved participants' understanding of contraceptive methods and enhanced their ability to select contraceptive options that aligned with their individual needs and reproductive goals. These findings support the concept of informed contraceptive choice as a fundamental component of high-quality family planning services, where individuals are empowered to make decisions based on accurate and comprehensive information [21].

One possible explanation for these findings is the ability of e-modules to provide flexible, standardized, and easily accessible educational content. Unlike conventional counseling, which may be constrained by limited consultation time and variations in healthcare providers' communication skills, digital educational media allow users to access information repeatedly and at their own pace. This repeated exposure to information can improve comprehension and retention of knowledge, ultimately strengthening individuals' confidence in making contraceptive decisions. Similar findings have been reported in previous studies demonstrating that digital health interventions improve health literacy, patient engagement, and decision-making capacity in reproductive health services [22].

The present review also found that positive outcomes were observed across different forms of digital interventions, including web-based educational platforms, mobile applications, and digital decision aids. Although the technological formats differed, all interventions demonstrated beneficial effects on contraceptive knowledge and decision quality. This finding suggests that the effectiveness of digital contraceptive education may depend more on the quality, clarity, and relevance of educational content than on the specific technological platform used. Previous studies reported that women value educational resources that provide balanced, evidence-based, and personalized information regarding contraceptive options, supporting the importance of user-centered educational design. Contraceptive care is an essential health service that allows people to achieve their reproductive goals, including the prevention of undesired pregnancy [23].

Another important finding is the potential role of digital contraceptive education in reducing decisional conflict and improving satisfaction with contraceptive choices. Access to comprehensive information enables women to better evaluate the advantages and disadvantages of available methods and select options that correspond to their preferences and health conditions. Previous research has shown that decision-support tools can improve the quality of healthcare decisions by increasing knowledge and reducing uncertainty during the decision-making process. Therefore, integrating e-module-based education into family planning services may contribute to more patient-centered contraceptive counseling.

From a nursing perspective, the implementation of e-module-based contraceptive education may serve as a complementary strategy to traditional counseling. Nurses play a central role in providing reproductive health education and facilitating informed decision-making. Digital educational resources can reinforce information delivered during counseling sessions, promote continuity of learning, and extend educational support beyond healthcare facilities. This approach is particularly relevant in settings with limited healthcare personnel or high patient volumes, where opportunities for prolonged face-to-face counseling may be restricted [24].

Despite the promising findings, several limitations should be considered when interpreting the results of this review. The included studies varied considerably in study design, sample size, intervention characteristics, and outcome measures. Such heterogeneity limits direct comparison among studies and precludes conclusions regarding the magnitude of intervention effects. Nevertheless, the consistency of positive findings across diverse settings and populations suggests that e-module-based contraceptive education has substantial potential to support informed contraceptive decision-making. Future research should employ larger randomized controlled trials and longer follow-up periods to evaluate the sustainability of intervention effects and their influence on long-term contraceptive use and continuation rates [25].

This systematic review has several limitations, including heterogeneity in study designs, forms of digital education interventions, and variations in outcome measurement tools used across studies, which limit direct comparisons and meta-analyses. Furthermore, several studies had methodological and reporting limitations that potentially pose a risk of bias. Language restrictions to Indonesian and English articles and the exclusion of gray literature may also contribute to publication bias. Most studies evaluated short-term outcomes, so the long-term impact of e-module-based contraceptive education on the sustainability of contraceptive use cannot yet be comprehensively concluded.

CONCLUSION

E-module-based contraceptive education is effective in improving knowledge and supporting informed contraceptive decision-making among women of reproductive age. The reviewed evidence suggests that digital education can serve as a valuable strategy to enhance contraceptive decision-making.

Ethical consideration, competing interest and source of funding

-Although this review did not require formal ethical certification, all procedures followed essential ethical principles through transparent reporting, accurate synthesis, and reliance on previously approved studies.

-There is no conflict of interest related to this research.

-Source of funding is authors.

REFERENCES

1. D'Souza P, Bailey JV, Stephenson J, Oliver S. Factors influencing contraception choice and use globally: a synthesis of systematic reviews. *The European Journal of Contraception & Reproductive Health Care*. 2022 Sep 3;27(5):364-72.
2. Tohit NF, Haque M. Forbidden conversations: A comprehensive exploration of taboos in sexual and reproductive health. *Cureus*. 2024 Aug 12;16(8):e66723.
3. Hall KS, McDermott Sales J, Komro KA, Santelli J. The state of sex education in the United States. *J Adolesc Health*. 2016;59:595–7. doi:10.1016/j.jadohealth.2016.03.032.
4. D'Souza P, Bailey JV, Stephenson J, Oliver S. Factors influencing contraception choice and use globally: a synthesis of systematic reviews. *The European Journal of Contraception & Reproductive Health Care*. 2022 Sep 3;27(5):364-72.
5. Askew I, Weinberger M, Dasgupta A, Darroch J, Smith E, Stover J, Yahner M. Harmonizing methods for estimating the impact of contraceptive use on unintended pregnancy, abortion, and maternal health. *Global Health: Science and Practice*. 2017 Dec 28;5(4):658-67.
6. Teal S, Edelman A. Contraception selection, effectiveness, and adverse effects: A review. *Jama*. 2021 Dec 28;326(24):2507-18.
7. Ontiri S, Mutea L, Naanyu V, Kabue M, Biesma R, Stekelenburg J. A qualitative exploration of contraceptive use and discontinuation among women with an unmet need for modern contraception in Kenya. *Reproductive Health*. 2021 Feb 9;18(1):33.
8. Adhayanti I, Pakadang SR. Development of a medicinal chemistry e-module using a team-based learning strategy. *JInoP (Jurnal Inovasi Pembelajaran)*. 2025 May 9;11(1):1-4.
9. Widodo A, Nursalam. Pemanfaatan media digital dalam pendidikan kesehatan. *J Keperawatan*. 2020;12(2):85–92.
10. Bailey JV, Murray E, Rait G, Mercer CH, Morris RW, Peacock R, et al. Interactive computer-based interventions for sexual health promotion. *Cochrane Database Syst Rev*. 2010;CD006483. doi:10.1002/14651858.CD006483.pub2.
11. Dehlendorf C, Fitzpatrick J, Fox E, Holt K, Vittinghoff E, Reed R, et al. Cluster randomized trial of a patient-centered contraceptive decision support tool, My Birth Control. *Am J Obstet Gynecol*. 2019;220(6):565.e1–565.e12. doi:10.1016/j.ajog.2019.02.015.
12. Goueth RC, Maki KG, Babatunde A, Eden KB, Darney BG. Effects of technology-based contraceptive decision aids: a systematic review and meta-analysis. *Am J Obstet Gynecol*. 2022;227:705–713.e9. doi:10.1016/j.ajog.2022.06.050.
13. Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ*. 2015;349:g7647. doi:10.1136/bmj.g7647.
14. Kus LH, Paul R, Nigaglioni Rivera A, Zeal C, Madden T. Improvement in contraceptive knowledge after using an online educational resource. *Contraception*. 2023;126:110095. doi:10.1016/j.contraception.2023.110095.
15. Zeal C, Paul R, Dorsey M, Politi MC, Madden T. Young women's preferences for contraceptive education and development of an online educational resource. *PEC Innov*. 2022;1:100046. doi:10.1016/j.pecinn.2022.100046.
16. Aryvia NS, Hestiyana N, Mahdiyah D, Lathifah N. Improving the knowledge of women of reproductive age about contraception through use of Klik KB. *Health Sci Int J*. 2025;3(2):144–54. doi:10.71357/hsij.v3i2.62.
17. Feriani P, Yunitasari E, Efendi F, Krisnana I, Ernawati R, Tianingrum NA, et al. A systematic review of determinants influencing family planning and contraceptive use. *Iran J Nurs Midwifery Res*. 2024;29(5):596–607. doi:10.4103/ijnmr.ijnmr_321_23.
18. Pazol K, Zapata LB, Tregear SJ, Mautone-Smith N, Gavin LE. Impact of contraceptive education on contraceptive knowledge and decision making: a systematic review. *Am J Prev Med*. 2015;49:S46–56. doi:10.1016/j.amepre.2015.03.031.
19. Goueth RC, Maki KG, Babatunde A, Eden KB, Darney BG. Effects of technology-based contraceptive decision aids: a systematic review and meta-analysis. *Am J Obstet Gynecol*. 2022;227:705–713.e9. doi:10.1016/j.ajog.2022.06.050.
20. Cartwright AF, Alspaugh A, Britton LE, Noar SM. mHealth interventions for contraceptive behavior change in the United States: a systematic review. *J Health Commun*. 2022;27(2):69–83. doi:10.1080/10810730.2022.2044413.
21. Senderowicz L. Contraceptive autonomy: conceptions and measurement of a novel family planning indicator. *Studies in Family Planning*. 2020 Jun;51(2):161-76.
22. Murray MC, Persps et al. Digital health interventions and reproductive health decision-making: a review of evidence. 2020.
23. Palazzolo B, Aikens JE, Sen A, Guetterman TC, Buis LR, Dalton VK, et al. A web-based contraception decision tool for individuals with health conditions in US outpatient clinics: protocol for a mixed methods cluster randomized controlled trial. *JMIR Res Protoc*. 2025;14:e71101. doi:10.2196/71101.
24. Stewart D. International Council of Nurses: Nurses—a voice to lead a vision for future healthcare. International Nurses Day 2021 resources and evidence. 2021.
25. World Health Organization. Family planning: A global handbook for providers. Geneva: WHO; 2022.