






METHODS AND PROTOCOLS OPEN ACCESS

Digital Sexual Health Education for Young Adults (18–35 Years): A Scoping Review Protocol

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ABSTRACT

Background and Aims: Young adults is a key stage for sexual development. Digital interventions provide innovative ways to deliver sexual health education to young adults. This scoping review protocol outlines a plan to map the existing literature on digital sexual health education (DSHE) for young adults, focusing on the dimensions and characteristics of these interventions.

Methods: This scoping review will adhere to a comprehensive 14-step methodological framework, integrating the established Arksey and O'Malley methodology with enhancements by Tricco and Peters. This review will follow the PRISMA-ScR guidelines. The study selection process adhered to the PICOS framework. A combination of thesauri and free-text methods will be employed. Keywords within each concept were connected using the Boolean operator “OR,” whereas different concepts were linked using the operator “AND.” Databases such as Web of Science (ISI), PubMed, Scopus, EMBASE, and the Cochrane Library (CDSR, Central) and search engines such as Google Scholar and Elmet were utilized. The extracted data will be synthesized and presented using diagrams and tables accompanied by a narrative summary.

Discussion: This scoping review will provide a valuable synthesis of the current state of DSHE for young adults. The findings are intended to inform the development and implementation of effective DSHE programs by researchers, educators, policymakers, and healthcare providers. Ultimately, this study contributes to a broader effort to improve the sexual health of young adults.

Ethical Code: IR.SHMU.REC.1403.085.

1 | Introduction

Young adulthood, typically spanning from 18 to 35 years, represents a pivotal stage of development during which individuals establish behaviors and attitudes, including those related to sexual health, with potentially lifelong implications [1–3]. Ensuring access to accurate, developmentally appropriate, and culturally relevant sexual health information is a fundamental right for all young people [4, 5]. It can lead to increased

knowledge, improved attitudes, behavior change, and reduced risk behaviors [6].

Traditional modalities of sexual health education, such as in-person workshops or classroom-based instruction, often present limitations. These include logistical barriers such as cost, time commitment, and geographical constraints, as well as challenges related to privacy and confidentiality [7–9]. The sensitive nature of sexual health, compounded by societal stigma, can

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Summary

- Digital sexual health education (DSHE) has the potential to reach large numbers of young adults, but its effectiveness and optimal design are not well understood.
- This scoping review will systematically identify and map existing studies on DSHE for young adults with a robust 14-step framework, combining Arksey and O'Malley's methodology with enhancements by Tricco and Peters. This ensures a rigorous and transparent review process.
- The findings of this review will inform the development of evidence-based DSHE interventions and provide guidance for future research.

inhibit individuals from seeking information or engaging in open dialogue [10].

Digital sexual health education (DSHE) offers a promising alternative by leveraging technology to overcome these limitations. DSHE encompasses a diverse range of interventions delivered via digital platforms, including websites, mobile applications, social media, and interactive games [11]. This approach affords several distinct advantages such as increased reach and accessibility, enhanced privacy and anonymity, and scalability and cost-effectiveness [12, 13].

To inform the development of an effective e-course of sexual health education for young adults, this scoping review aims to address the following research questions, given the lack of a comprehensive review in this area.

1. What are the types of DSHE interventions for young adults?
2. What are the key characteristics and design features of these DSHE interventions?
3. What are the dimensions of these DSHE interventions?
4. What are the identified gaps in the current landscape of DSHE, and what are the opportunities for future research?

By answering these questions, this review will provide valuable insights into the current state of DSHE, identify best practices, and inform the design of an effective and engaging digital intervention to promote sexual health and well-being among young adults.

2 | Objectives

2.1 | Primary Outcomes

To investigate the dimensions (such as content and format) and characteristics (such as the use of learning theories, personalized feedback, and accessibility) of DSHE for young adults.

2.2 | Secondary Outcomes

1. To identify the types of DSHE for young adults such as websites and mobile applications.

2. To identify gaps in the current DSHE landscape and opportunities for future research.

3 | Methods and Analysis

This review's protocol adheres to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) [14]. This review will adhere to the PRISMA-ScR reporting guidelines [15]. This scoping review will be conducted using a rigorous 14-step framework. This framework synthesizes the well-regarded Arksey and O'Malley methodology [16] with important enhancements proposed by Tricco and Peters [17, 18] to ensure a thorough and transparent investigation. This comprehensive approach will guide the review process through various stages, including the following:

1. Develop the research protocol
2. Define the research question and objectives
3. Establish inclusion/exclusion criteria
4. Search relevant resources
5. Evaluate reference lists
6. Search gray literature
7. Screen studies/articles
8. Study selection
9. Design a data charting template
10. Execute data charting
11. Present results in tables and figures
12. Provide a flowchart
13. Identify research implications
14. Identify practical implications

3.1 | Registry

Ethical approval for this study (code number IR.SHMU.REC.1403.085) was obtained from the Ethics Committee of Shahrood University of Medical Sciences.

3.2 | Inclusion and Exclusion Criteria

To ensure the rigor and relevance of the included studies, a systematic selection process was conducted utilizing the established PICOS framework [19, 20]. This framework, a cornerstone of evidence-based research, facilitates a focused and transparent approach to study identification by clearly defining the Population, Intervention, Comparison, Outcomes, and Study design. A detailed explication of the PICOS criteria employed in this review is provided in Table 1.

This study employed machine translation to analyze all relevant scholarly articles, regardless of language, ensuring a comprehensive and unbiased review. The literature search covered July

TABLE 1 | PICOS framework.

	Property	Inclusion criteria	Exclusion criteria
P	Population	Young adults (18–35)	Studies that include groups of women, men, and girls and boys who are not categorized as young adults.
I	Intervention	E-learning interventions.	Studies with other interventions.
C	Comparison	No intervention or other types of interventions or usual care.	Not applicable.
O	Outcome	Health outcomes related to sexual health.	Studies with other outcomes.
S	Study design	Systematic review, meta-analysis, randomized controlled trials, non-RCT, quasi-experimental, qualitative studies, studies with a mixed-methods approach.	Letter to the editor, conference papers, case report and case series studies, protocols, unpublished articles, commentary, gray literature, meeting or conference abstract.

1, 1990, to November 1, 2024, capturing the most current evidence base and aligning with the updating policies of the consulted databases.

3.3 | Search Methods and Sources (Search Strategy)

This section's reporting will adhere to the PRISMA-S checklist [21]. To ensure the research's originality, we conducted thorough searches in PROSPERO and the Cochrane Library to identify any similar or existing systematic reviews. Furthermore, we meticulously examined the reference lists of the identified reviews to guarantee the inclusion of all relevant studies.

A comprehensive search strategy was designed to ensure the retrieval of all relevant literature. This involved systematically categorizing search terms into key concepts, such as (Population AND Intervention AND Outcome), and identifying corresponding keywords aligned with the study objectives and inclusion criteria. This meticulous approach aimed to maximize the inclusivity of the literature review and minimize the risk of missing relevant studies.

This study will utilize a combined approach to identify relevant keywords and phrases. Established thesauri (MeSH, Emtree, Educational Resource Information Center [ERIC], Thesaurus, IRANDOC thesauri) will be consulted alongside free-text methods, including examining related articles and specialized books. Expert opinion will also be sought to capture nuanced and emerging terminology. This multifaceted approach ensures a comprehensive and robust set of keywords for the study.

To ensure cultural relevance, this study utilized both English and Persian language resources to identify appropriate Persian equivalents for key sexual health concepts. This bilingual approach was essential to the first phase of a mixed-methods study focused on designing, implementing, and evaluating an e-course on sexual health education specifically for Iranian young adults. This groundwork will allow for the development of a culturally sensitive and effective online educational intervention.

Search strategies will be customized for each database and search engine to ensure that the most relevant results are found. Keywords related to the same idea will be combined using

“OR,” whereas distinct ideas will be linked using “AND.” A complete log of the search terms used for each database will be provided in the final review report.

To ensure a comprehensive overview of the relevant literature, a multi-faceted search strategy was employed. This strategy, conducted by the researcher S.B., encompassed a range of prominent research databases, including Web of Science (ISI), PubMed, Scopus, EMBASE, and the Cochrane Library (CDSR, Central). Expanding the scope beyond these traditional databases, search engines such as Google Scholar and Elmet were also incorporated to identify potentially relevant studies across a wider range of sources.

The included articles will be analyzed using forward and backward citation tracking. This means examining both the sources cited by the articles (backward tracking) and identifying later works that cite them (forward tracking). This approach helps understand the articles' influence, context, and how their contributions have been used and expanded upon.

3.4 | Study Records

3.4.1 | Data Management

All identified records will be uploaded to HubMeta [22], a platform for managing systematic reviews. This platform will be used to identify and remove duplicate entries, ensuring only one copy of each record is retained. After an initial screening of titles and abstracts, full-text articles will be uploaded to HubMeta for in-depth review. Unsuitable records will be managed using a separate reference manager. This approach ensures efficient organization and analysis of all identified literature.

3.4.2 | Selection Process

Study selection was conducted in two phases. The first phase involved screening titles and abstracts, categorizing studies as included, probable included, or excluded. Studies were excluded if full-text access could not be obtained despite three documented attempts to contact corresponding authors. In the second phase, the full text of the remaining articles was independently evaluated by two reviewers according to pre-defined inclusion and exclusion

criteria. Any discrepancies between reviewers were resolved through consensus or, if necessary, by a third-party arbitrator.

A PRISMA flowchart (Figure 1) will transparently document the selection of articles, detailing reasons for inclusion or exclusion. Study authors will be contacted as needed for missing data. At least three screening checklist criteria will be used, and the Kappa statistic will be calculated using HabMeta to assess inter-rater reliability.

3.4.3 | Data Collection and Analysis

Two independent extractors will meticulously review the full text of each selected study. A standardized data charting form, rigorously developed and piloted by the research team, will guide the systematic extraction of key study characteristics. This form aligns with the PICO framework and captures details such as Study Characteristics (authors, year of publication, study design, country of study, and language of publication), Participant Characteristics (target population [age/gender], sample size, and socioeconomic status), Intervention Characteristics (intervention and control groups, intervention type, content, theoretical framework, delivery method, duration, and frequency), Outcomes (outcome measures, measurement tools, and results), and Other Characteristics (strengths of the study and limitations of the study). The extraction process will be iterative, allowing for adjustments to the variables and their definitions as needed to ensure comprehensive and accurate data collection.

S.B. will be contacted as necessary to obtain any missing information deemed critical for robust data synthesis to ensure the

completeness of the extracted data. A rigorous quality assurance process will be employed to resolve potential discrepancies between the two independent extractors. This process will involve consultation with the third researcher to establish consensus and guarantee the accuracy of the extracted data. Subsequently, the finalized data will be systematically categorized and organized to facilitate efficient and effective analysis.

3.5 | Critical Appraisal

Given the focus of this review is to provide a comprehensive mapping of the existing literature, a formal quality appraisal will not be conducted for the included studies [15].

Adhering to the Australian National Health and Medical Research Council (NHMRC) classification for intervention studies [23], a dual-assessors approach will be employed to independently assess the level of evidence for each included study. Discrepancies in assessment will be resolved through collaborative discussion and consensus-building between the assessors. In instances where consensus cannot be achieved, an independent third assessor will arbitrate. Inter-rater reliability will be evaluated and reported using kappa statistics and percentage agreement to ensure the rigor and objectivity of the evidence assessment process.

3.6 | Data Synthesis and Analysis

The extracted data will be synthesized and presented using diagrams and tables that effectively communicate the key

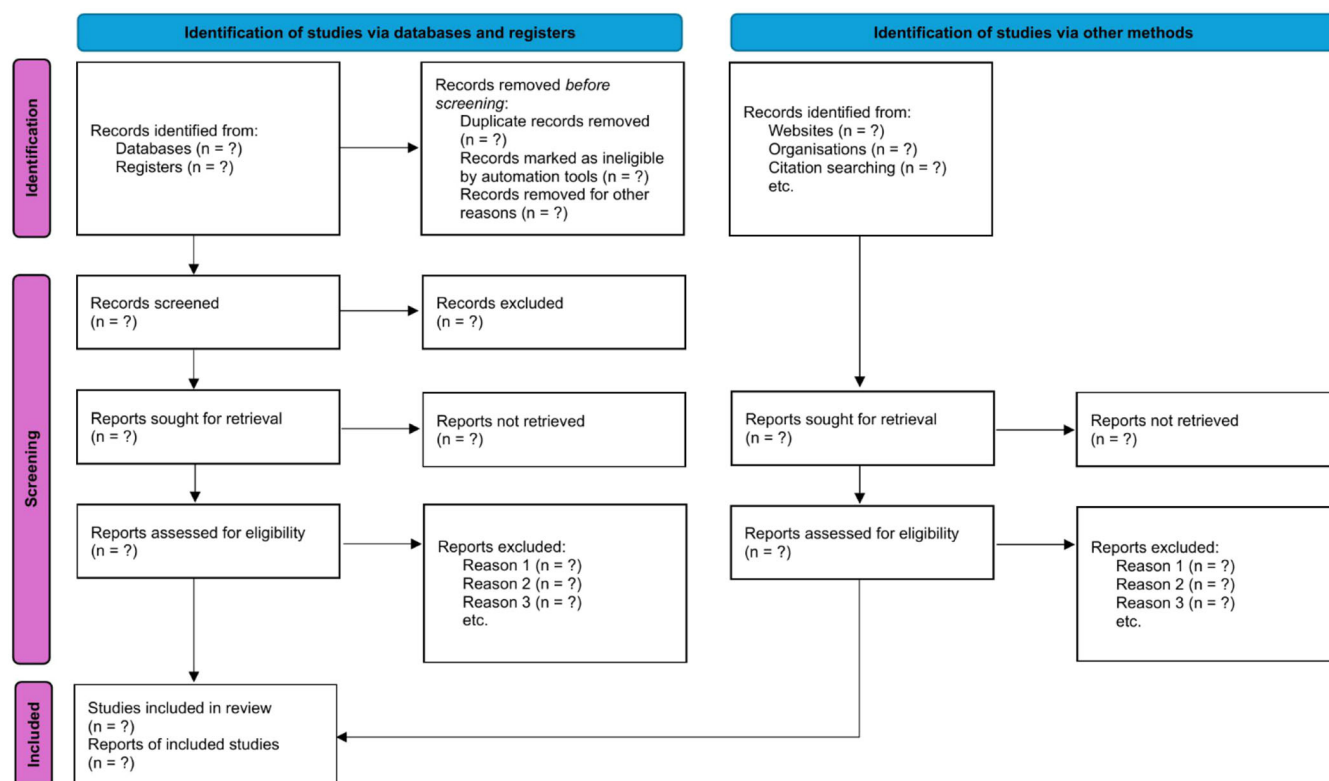


FIGURE 1 | PRISMA flowchart.

findings in alignment with the review's objectives. These visual representations will be accompanied by a narrative summary to provide context and further elaborate.

3.7 | Patient and Public Involvement

This scoping review was designed to analyze existing research data; thus, patient and public involvement were not included in its conception.

4 | Discussion

This scoping review aims to comprehensively analyze the current landscape of DSHE for young adults. The findings will serve as a valuable resource for researchers, educators, policy-makers, and healthcare providers working to develop and implement effective DSHE programs. By contributing to the knowledge base in this area, this review ultimately supports the broader goal of improving the sexual health and well-being of young adults.

Author Contributions

Sanam Borji-Navan: conceptualization, methodology, project administration, writing – original draft, writing – review and editing. **Shahrbano Salehin:** conceptualization, methodology, writing – review and editing, supervision, validation. **Tahereh Naseri-BooriAbadi:** conceptualization, writing – review and editing. **Shahrbano Goli:** conceptualization, writing – review and editing. **Mojgan Mirghafourvand:** conceptualization, methodology, writing – review and editing.

All authors have read and approved the final version of the manuscript. Corresponding author (S.S.) had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis. S.S. affirms that this manuscript is an honest, accurate, and transparent account of the planned scoping review; that no important aspects of the review methodology have been omitted; and that any anticipated deviations from the protocol will be documented and explained.

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Ethics Statement

This study, conducted as part of a PhD thesis in Reproductive Health (code 1699) at Shahroud University of Medical Sciences. This protocol, approved by the Ethics Committee of Shahroud University of Medical Sciences (code: IR.SHMU.REC.1403.085) (File S1), will be conducted in full compliance with relevant guidelines and regulations. Any amendments will be documented in the final publication.

Consent

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The authors have nothing to report.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.