



Reframing Menstrual Hygiene Education: Mapping Pedagogical Interventions for Adolescent Girls Through a Scoping Review

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Abstract: This scoping review aims to identify and categorize pedagogical interventions designed to enhance menstrual hygiene knowledge, attitudes, and practices among adolescent girls. The study was conducted in accordance with PRISMA-ScR guidelines. Literature published between 2020 and 2026 was retrieved from PubMed, EBSCOhost, SAGE Journals, Scopus, and ScienceDirect using a Population–Exposure–Outcome (PEO) search strategy. Studies were included if they involved adolescent girls, examined menstrual hygiene education interventions, and reported outcomes related to knowledge, attitudes, or practices. Data were extracted and analyzed descriptively, and methodological quality was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools. The 15 included studies were predominantly conducted in South and Southeast Asia, as well as Sub-Saharan Africa. Notably, six studies employed digital approaches, while nine utilized conventional methods, reflecting a growing trend toward technology-based interventions. The interventions varied widely, including digital and mHealth-based approaches, school-based education, peer-led programs, and multicomponent strategies. Improvements were consistently reported in knowledge and attitudes, whereas changes in hygiene practices were less consistent across studies. Theoretical frameworks such as Bandura’s Social Cognitive Theory and Mayer’s Cognitive Theory of Multimedia Learning were commonly used to support intervention effectiveness. Overall, educational interventions are evolving toward more participatory and technology-enhanced models that create safe spaces for adolescents. These findings provide guidance for educational practitioners and curriculum developers in designing more effective, inclusive, and adolescent-centered menstrual hygiene education programs.

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Introduction

Globally, more than 300 million women menstruate daily (Bank, 2024). Despite the widespread nature of menstruation, access to menstrual health education is limited, with only 39% of schools worldwide providing such education (WHO/UNICEF, 2024). Additionally, approximately 500 million women lack access to adequate menstrual products and appropriate facilities for menstrual hygiene management (Bank, 2024). This situation, known as *period poverty*, presents significant challenges for adolescent girls and is associated with adverse reproductive health outcomes, increased risk of infection, reduced school attendance, and psychosocial consequences such as shame and low self-esteem (Babbar et al., 2022; Deniz & Acikgoz, 2024; News, 2023). Inadequate hygiene practices during menstruation,

including insufficient handwashing, use of unsuitable underwear, and poor genital hygiene, further exacerbate these health risks (Anbesu & Asgedom, 2023; UNICEF, 2019).

Proper menstrual hygiene is essential for maintaining women's health and quality of life (Babbar et al., 2022; Bank, 2024; Majeed et al., 2022; Namuwonge et al., 2025; Parkinson et al., 2024). Inadequate menstrual hygiene practices can result in health problems such as urinary tract infections, bacterial vaginosis, genital irritation, and itching associated with sanitary pad use (Ademas et al., 2020; Al Karmi et al., 2024; Borg et al., 2023; Somroo et al., 2023). Consequently, menstrual hygiene education plays a vital role in improving adolescents understanding of reproductive health maintenance and in promoting safe hygiene practices during menstruation (Betsu et al., 2024; Joshi & Mendhe, 2025; Manimaran et al., 2024; Parasuraman et al., 2022; Sebert Kuhlmann et al., 2025).

Despite the importance of safe menstrual hygiene, practices among adolescent girls, especially in school environments, remain suboptimal (Ahmed et al., 2025; Betsu et al., 2024; Davis et al., 2018; M et al., 2023). Several factors shape these practices, including family support, prevailing social and cultural norms, limited access to sanitation facilities, and inadequate health education. A lack of environmental support and structured education can adversely affect adolescent girls' health, comfort, confidence, and participation in school activities during menstruation. Strengthening menstrual hygiene management through the involvement of schools, health professionals, and government institutions is therefore essential (Betsu et al., 2024; Onubogu et al., 2024; Rathoria et al., 2024; Tshivule et al., 2025).

A range of menstrual hygiene management (MHM) interventions have been implemented, particularly in school-based settings (Betsu et al., 2024). Evidence indicates that these interventions can enhance menstrual knowledge, attitudes, awareness of genital hygiene, self-confidence, and school attendance among adolescent girls (Betsu et al., 2024; Ismail et al., 2024; Joshi & Mendhe, 2025; Pratama et al., 2026). Additionally, school-based MHM and water, sanitation, and hygiene (WASH) interventions foster communication skills, enabling girls to discuss menstruation more openly with peers, teachers, and parents (Andargie & Tinuola, 2025; Ismail et al., 2024; Pratama et al., 2026; Tshivule et al., 2025). However, while improvements in knowledge and attitudes are frequently observed, sustained changes in menstrual hygiene practices remain limited, particularly in rural and resource-constrained settings (Aggarwal et al., 2021; Dutta & Mishra, 2025; Ganguly et al., 2025; Onubogu et al., 2024; A. Singh et al., 2022).

Recently, digital-based menstrual health education has emerged as a promising strategy; however, its effective implementation remains limited and warrants further investigation. Most interventions to date have focused on menstrual product provision and basic education, while improvements to the physical environment at home and school, as well as shifts in social norms surrounding menstruation, have received less attention (Fuadah et al., 2026; Gbogbo et al., 2025; Joshi & Mendhe, 2025; Shah et al., 2025; Wihdaturrahmah & Chuemchit, 2023). Although many studies have demonstrated the positive effects of menstrual hygiene education on adolescent girls' knowledge, attitudes, and practices, the evidence is fragmented across various approaches, settings, and intervention designs (Betsu et al., 2024; Evans et al., 2022; Tshivule et al., 2025). Therefore, a comprehensive synthesis is required to systematically map the pedagogical interventions used to promote menstrual hygiene among adolescent girls. Such mapping is necessary to understand existing strategies, identify gaps in the evidence, and inform future interventions and public health policies to improve menstrual hygiene management. The findings of this review are also expected to

provide guidance for educational practitioners and curriculum designers in developing more effective, inclusive, and adolescent-centred menstrual hygiene education program.

Research Method

This scoping review was conducted and reported in accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guidelines (Tricco et al., 2018). Studies published in English between 2020-2026 with full-text availability were included if they involved adolescent girls, examined educational interventions on menstrual hygiene, and reported outcomes related to knowledge, attitudes, and/or practices; reviews, meta-analyses, and studies without relevant outcomes were excluded. The search strategy was formulated using the PEO (population, exposure, and outcome) framework and applied across PubMed, EBSCOhost, SAGE Journals, Scopus, and ScienceDirect using the following search keywords: (*adolescent girls*) AND (*educational intervention OR health education OR educational program*) AND (*knowledge OR attitude OR practice*) AND (*menstrual hygiene OR menstrual hygiene management*).

The study selection process consisted of two stages: initial screening of titles and abstracts, followed by a full-text assessment for eligibility. Discrepancies were resolved through discussion. Data extraction focused on study characteristics, types and delivery modes of educational interventions, including formal school-based, peer-led, community-based, and digital educational approaches, as well as primary menstrual hygiene outcomes, including knowledge, attitudes, and practices. Methodological quality was evaluated descriptively using the Joanna Briggs Institute (JBI) Critical Appraisal Tools, according to the respective study designs (Hilton, 2024; Ho et al., 2026).

Results and Discussion

Study identification and selection followed the PRISMA guidelines and are presented in a flow diagram (Figure 1). Of the 2,904 records identified, 15 studies met the inclusion criteria and were included in this scoping review. Articles were searched through PubMed, EBSCOhost, SAGE Journals, Scopus, and ScienceDirect. Study identification and selection followed the PRISMA guidelines and are presented in a flow diagram (Figure 1).

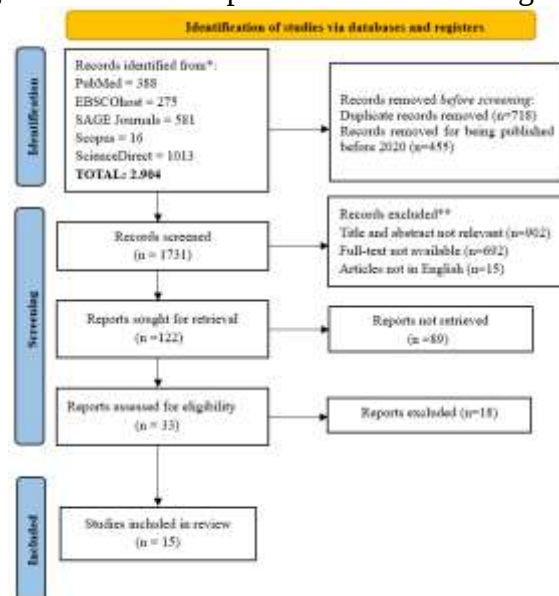


Figure 1. PRISMA Flowchart



Tabel 1. Literature Review

No	Author / Year	School / Setting	Intervention	Conclusion
1	Fuadah et al., 2026	Junior High Schools in Bandung Regency	Media digital (animated video and an interactive booklet)	Digital menstrual hygiene education using animated videos and interactive booklets effectively improved adolescent girls' knowledge and attitudes compared with the control group that did not receive the digital intervention.
2	Bagirisano et al., 2025	Four specialized schools	Audio-recorded menstrual hygiene education program	The audio-based intervention significantly improved menstrual hygiene knowledge and practices.
3	Ayieko et al., 2025	Four government schools in Nyamagana and Misungwi districts in the Mwanza region of northwest Tanzania	Multi-component intervention: MSRH education, menstrual kits, WASH improvements, pain management training	The multifaceted school-based intervention improved menstrual practices, psychosocial outcomes, and school participation among girls.
4	Yadav et al., 2025	Residential schools for visually impaired students	Menstrual hygiene module with health education, tactile diagrams, 3D models, and product demonstrations	The menstrual hygiene module improved knowledge and perceptions, while changes in practices were limited.
5	Chidya et al., 2024	Rural primary schools	Menstrual hygiene education, provision of menstrual products, and WASH facility improvements	Menstrual hygiene interventions improved school attendance and menstrual hygiene practices.
6	Rahman et al., 2024	Rural secondary high school	Mobile health (mHealth)-based menstrual hygiene education	mHealth education shows potential to improve menstrual hygiene knowledge and practices
7	Ghimire et al., 2024	2 government basic schools, Pokhara Metropolitan	School-based health education sessions (videos, mini-lectures, simulations, discussions, handouts)	Structured health education significantly improved menstrual hygiene knowledge and practices compared with the control group.
8	Marpaung et al., 2024	Islamic junior high school, Medan	Mobile health (application MESH-TEEN)	The mHealth application significantly improved knowledge, attitudes, and practices related to menstrual hygiene.
9	Vagha et al., 2023	Three different rural schools, Central India	Didactic health education lecture	Short-term educational counselling improved menstrual hygiene knowledge and practices.
10	Nastiti et al., 2023	Public junior high school, Kalimantan	Video-based education sessions plus a leaflet	Video-based health education improved knowledge and attitudes more effectively than leaflet-only education.
11	Parasuraman et al., 2022	Urban public schools, Tamil Nadu	Structured, multipronged health education program (PowerPoint)	Planned health education significantly improved menstrual knowledge, attitudes, and hygiene

			presentations, placards, posters, videos, and detailed handouts on menstruation and its hygiene practices)	practices.
12	Shah et al., 2022	Multiple rural primary and secondary schools (two regions)	Multi-component intervention including peer education, community engagement, and school WASH improvements	The multi-component intervention improved menstrual health and reduced menstruation-related school absenteeism.
13	Shankar et al., 2020	Five government-aided schools in low-income urban communities in Mumbai	Peer-led school-based health education (including menstrual health module)	Peer-led education significantly increased menstrual health knowledge and positive attitudes.
14	Kokiwar & Nikitha, 2020	Rural community schools	Focused group discussion vs didactic lecture	Both methods improved knowledge and practices, with focused group discussion more effective for knowledge gains.
15	Dwivedi et al., 2020	Government higher secondary school of village Keru, Jodhpur, Rajasthan	Peer-led education (PRAGATI), PowerPoint sessions, comic book <i>Menstrupedia</i>	Peer-led menstrual hygiene education significantly improved knowledge, attitudes, and practices among adolescent girls.

Overview of Included Studies

The studies included in this scoping review were published between 2020 and 2026, reflecting an increasing emphasis on educational interventions for menstrual hygiene among adolescent girls. Among the 15 studies reviewed, most utilized quasi-experimental designs. The remainder employed mixed-methods approaches, pilot intervention studies, cluster-randomized controlled trials, or community-based intervention designs (Table 1). Geographically, the studies were conducted across Asia and Africa, with the largest numbers originating from India ($n = 6$) and Indonesia ($n = 3$). Additional studies were conducted in Bangladesh, Nepal, Rwanda, Tanzania, Malawi, and The Gambia (Figure 2). All included studies were conducted in low- and middle-income countries, highlighting the continued public health importance of menstrual hygiene education in these settings.



Figure 2. Geographical distribution of studies included in the scoping review (2020–2026). The map illustrates the countries from which the included articles originated.

Types of Educational Interventions

a) Digital and mHealth-Based Interventions

Multiple studies have evaluated digital and mobile health (mHealth) educational interventions, such as animated videos, interactive booklets, and mobile applications. These interventions consistently resulted in improved menstrual hygiene knowledge, with many studies also documenting positive changes in attitudes and practices. The effectiveness of digital interventions is attributed to their interactive features and enhanced engagement of adolescent girls compared to conventional methods (Bagirisano et al., 2025; Fuadah et al., 2026; Marpaung et al., 2024; Rahman et al., 2024; Yadav et al., 2025).

b) School-Based Health Education

School-based health education programs, delivered through lectures, videos, presentations, discussions, and printed materials, have been widely implemented. These interventions generally produced significant improvements in knowledge and attitudes, and in several studies, also led to enhanced menstrual hygiene practices among adolescent girls (Chidya et al., 2024; Ghimire et al., 2024; Nastiti et al., 2023; Parasuraman et al., 2022; Vagha et al., 2023).

c) Peer-Led and Participatory Approaches

Peer-led education programs and participatory approaches, including focused group discussions (FGD), have been reported as effective in improving menstrual hygiene knowledge and attitudes. Comparative studies indicate that interventions involving active participation yield greater knowledge gains than didactic lectures (Dwivedi et al., 2020; Kokiwar & Nikitha, 2020; Michael et al., 2020; Shankar et al., 2020).

d) Multicomponent Interventions

Several studies implemented multicomponent interventions that combined educational activities with menstrual product provision, improvements in water, sanitation, and hygiene (WASH) facilities, and community engagement. These comprehensive interventions were associated with enhanced menstrual hygiene practices and positive effects on psychosocial outcomes and school attendance (Ayieko et al., 2025; Shah et al., 2022).

Discussion

A range of educational interventions has been examined to improve menstrual hygiene knowledge, attitudes, and practices (KAP) among adolescent girls. The findings indicate that educational interventions have become increasingly diverse, with a clear trend toward more interactive, participatory, and technology-based approaches, in line with current developments in adolescent health education. The prevalence of school-based and peer-led interventions highlights the critical role of schools as strategic platforms for menstrual hygiene education (Agbede & Ekeanyanwu, 2021; Andargie & Tinuola, 2025; Berliana et al., 2026; Betsu et al., 2024). According to Social Cognitive Theory from Albert Bandura, learning occurs through exposure to social models, where individuals acquire behaviours by observing others in their environment. This observational learning process involves attention, retention, behavioural reproduction, and motivation, which explains how behaviour can be learned without direct experience or trial-and-error learning (Bandura, 2023). Previous studies on peer-led education reported that peers may act as behavioural models that influence health behaviours through observational learning and peer interaction (Liu et al., 2024; Mukau, 2025; Wille et al., 2025). School settings enable structured information dissemination and foster social interactions that shape adolescents' attitudes and behaviours (Andargie & Tinuola, 2025; Dwivedi et al., 2020; Ssemata et al., 2023). Evidence

consistently indicates that educational initiatives within schools improve menstrual hygiene knowledge, attitudes, and practices (Alsalamy et al., 2025; Chidya et al., 2024; Joshi & Mendhe, 2025; Shrestha et al., 2025).

The effectiveness of menstrual health education is also closely linked to a supportive school environment, including teachers' active roles as both information providers and sources of emotional support for students (Shenkman et al., 2023). Structured teaching programs have been shown to improve adolescent awareness and health behaviours more effectively than non-intervention settings. This reinforces the role of schools as important channels for delivering accurate health information to students (Joshi & Mendhe, 2025).

Effective implementation of health education requires structured content that aligns with students' developmental stages. Basic knowledge of reproductive anatomy and puberty should be introduced at the primary school level, followed by menstrual hygiene management at later stages (Jones & Baldwin, 2025). To ensure sustainability, these contents need to be embedded within the curriculum, supported by clear policy direction, sufficient instructional time, and standardized teaching guidelines for teachers (Mahfuz et al., 2021).

In practice, teaching approaches should prioritize participatory methods that allow students to feel comfortable. Small-group discussions and gender-sensitive sessions have been found to create a more open learning environment. A study in Bangladesh showed that separating learning sessions where girls were taught by female teachers and boys by male teachers helped reduce discomfort and psychological barriers when discussing reproductive health topics. This approach supports effective communication while respecting cultural norms and student comfort (Mahfuz et al., 2021).

The use of digital media and mobile health (mHealth) interventions reflects ongoing efforts to adapt educational strategies to the characteristics and learning preferences of adolescent populations (Fuadah et al., 2026; Mancone et al., 2024; Onukwugha et al., 2022; Rahman et al., 2024; Yana et al., 2024). These interventions commonly include animated videos, interactive booklets, and mobile applications, which support more engaging and accessible health education delivery (Fuadah et al., 2026; Marpaung et al., 2024; Parasuraman et al., 2022; Ramadhani et al., 2024; Yadav et al., 2025). The Cognitive Theory of Multimedia Learning, explains that presenting educational material through a well-designed combination of words and graphics in these digital formats helps the human mind process information effectively (Mayer, 2021; Mayer & Fiorella, 2021). This approach stimulates the learner's active thinking to foster meaningful learning. The meaningful learning process unfolds through three stages: the learner focuses on and filters relevant details from the digital lesson (*selecting*), organizes this new information into a coherent cognitive structure within their working memory (*organizing*), and connects this fresh knowledge with what they already know (*integrating*) (Mayer, 2024). Furthermore, providing these structured interactive digital materials serves as a helpful guide that effectively enhances adolescents' self-directed learning (SDL) skills (Pearson & Dubé, 2025). By empowering learners to control their own learning pace and manage their understanding independently, digital and mobile-based interventions are considered highly effective in boosting participant engagement and improving access to accurate menstrual hygiene information, particularly in settings with limited health education resources (Ghimire et al., 2024; Taylor, 2021).

Integration of menstrual hygiene education into school health programs, adolescent health policies, and Water, Sanitation, and Hygiene (WASH) initiatives is essential to strengthen the sustainability and broader impact of digitally delivered educational interventions (Andargie & Tinuola, 2025; Ayieko et al., 2025; Chidya et al., 2024;

Dassanayake et al., 2026). The diversity of educational approaches identified suggests that no single intervention is suitable for all contexts, underscoring the need for flexible and context-specific strategies, especially in low- and middle-income countries (Betsu et al., 2024; Joshi & Mendhe, 2025; Pratama et al., 2026; P. K. Singh et al., 2022; Ssemata et al., 2023).

In school environments with limited sanitation infrastructure and privacy, the learning process cannot rely solely on one-way instruction at the front of the classroom. The role of teachers as facilitators is essential to fostering interactive education that encourages schoolgirls to discuss and share their concerns actively. The most effective method is interactive education that encourages schoolgirls to actively discuss and share their concerns. This discussion space has proven far more effective at improving menstrual hygiene knowledge attitude and practices than distributing brochures or pamphlets alone. Small-group discussions effectively build girls self-confidence in environments where menstruation is considered a taboo topic, (Evans et al., 2022). To overcome the limitations of physical school facilities, educational programs must maximize the utilization of girls' immediate social networks, such as peers (peer-led) and parents (parent-led) (Betsu et al., 2024). This combination of peer and parental roles has been shown to yield the highest scores in menstrual management practices among schoolgirls in rural areas (Agbede & Ekeanyanwu, 2021). Through this economical, simple, and community-based approach, resource-constrained schools remain capable of delivering sustainable, confidential, and impactful reproductive health education (Betsu et al., 2024).

Conclusion

Menstrual hygiene education demonstrates a shift in educational approaches, with digital media and peer-led learning complementing traditional methods in low- and middle-income countries (LMICs). Findings indicate that these interventions improve adolescent girls' knowledge, attitudes, and practices. Interactive and digital approaches are more effective in enhancing student engagement than traditional lecture-based methods. These results highlight that digital media and peer networks function not only as tools but also as safe spaces that help girls overcome cultural taboos and social barriers. The findings of this review provide crucial guidance for educational practitioners and curriculum designers in developing more effective, inclusive, and adolescent-centred menstrual hygiene education programs. Schools must strengthen their role as integration hubs by embedding these digital and peer-based approaches to foster sustainable behavioural change.

Recommendation

The recommendation to schools is to integrate digital-based interventions and peer-led strategies into school health programs or activities. Policymakers are expected to support implementation by standardizing health education materials and equitably distributing supporting infrastructure in schools. Future researchers are advised to conduct longitudinal studies to assess the effectiveness of these interventions in changing students behaviour.

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