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Reducing School Absenteeism through Menstrual Hygiene Interventions: A Scoping Review of Evidence from African Countries

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Abstract:

- ***Background:***

Deficiencies in menstrual hygiene management (MHM) remain a pervasive but insufficiently addressed constraint on girls' educational participation in low- and middle-income countries (LMICs). Entrenched sociocultural taboos surrounding menstruation, inadequately equipped school environments, and constrained access to appropriate menstrual materials, particularly disposable or reusable sanitary pads, collectively contribute to recurrent school absence among adolescent girls.

- ***Objective:***

This scoping review sought to systematically map school-based MHM interventions implemented in LMICs, with particular emphasis on sub-Saharan Africa, and to synthesise available evidence on their influence on school attendance, menstrual hygiene behaviours, psychosocial outcomes, and academic performance.

- ***Methods:***

Guided by the PRISMA-ScR reporting guidelines and the Population–Concept–Context framework, a comprehensive search of peer-reviewed and grey literature published between 2015 and 2025 was undertaken using PubMed, Google Scholar, Scopus, and Web of Science. Eligible studies focused on schoolgirls aged 10–19 years in LMIC settings and evaluated interventions explicitly addressing MHM. Twenty-five studies met the inclusion criteria and were examined using narrative synthesis, with results organised thematically and documented through summary charts and a PRISMA flow diagram.

- ***Results:***

The identified interventions clustered into four broad categories: menstrual health education, provision of menstrual products, improvements to water, sanitation, and hygiene (WASH) facilities, and integrated interventions combining multiple components. Multi-component programmes demonstrated the most consistent and substantial effects, with several studies reporting reductions in menstruation-related school absenteeism of up to 70%. Positive changes in hygiene practices and psychosocial well-being were also frequently reported. Nonetheless, important evidence gaps persist, notably the scarcity of long-term evaluations, limited contextual and cultural tailoring of interventions, and inadequate representation of marginalised populations, including girls with disabilities and those residing in rural or conflict-affected settings.

- ***Conclusions:***

The available evidence indicates that integrated MHM interventions hold considerable promise for enhancing girls' school attendance and overall well-being in LMIC contexts. To sustain and scale these gains, policymakers should advance comprehensive national MHM policies, invest in resilient and gender-responsive WASH infrastructure, and adopt inclusive approaches that explicitly address equity and vulnerability. Menstrual health should be recognised as a fundamental component of the right to education rather than an obstacle to it.

Keywords: *Menstrual Hygiene, School Absenteeism, Adolescent Girls, LMICs, Sub-Saharan Africa, WASH, Gender Equity, Education Policy.*

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I. INTRODUCTION

➢ *Background and Context*

Menstrual hygiene management (MHM) is increasingly recognised as a central determinant of educational participation and psychosocial well-being among adolescent girls worldwide. Within low- and middle-income countries (LMICs), persistent deficiencies in water, sanitation, and hygiene (WASH) infrastructure, combined with entrenched cultural taboos, limited access to appropriate menstrual products, and inadequate menstrual health education, continue to undermine girls' regular school attendance (The Guardian, 2025; UNICEF, 2024). These constraints are particularly pronounced in sub-Saharan Africa, where many schools lack essential facilities such as private, lockable toilets and safe disposal mechanisms for menstrual waste. Recent estimates suggest that fewer than 11% of schools in the region provide even basic conditions necessary for effective MHM, exposing girls to discomfort, embarrassment, and health risks during menstruation (UNICEF, 2024).

At the global level, approximately 500 million women and girls are reported to live without access to adequate facilities for managing menstruation, a shortfall that disrupts daily activities and disproportionately affects school participation during adolescence (UNICEF, 2024). In LMIC contexts, these infrastructural gaps intersect with restrictive social norms and institutional neglect. Many schools operate without reliable access to clean water, soap, or disposal bins, all of which are fundamental to dignified and hygienic menstrual care (WaterAid, 2024). As a result, menstruation becomes not only a biological process but also a structural barrier to educational continuity.

Empirical evidence from sub-Saharan Africa and South Asia indicates that between 50% and 70% of school-aged girls miss at least one or two days of school during each menstrual cycle, primarily due to inadequate facilities, fear of stigma, and the unavailability of menstrual products (Das et al., 2015; Kearney & Graczyk, 2023). National-level data further illustrate the magnitude of the problem. In Nigeria, for instance, approximately 40% of girls report school absenteeism that is directly attributable to menstruation-related challenges (Okeke, Bello, & Ahmed, 2022). Qualitative and mixed-methods studies from South Sudan and Ethiopia additionally reveal that anxiety associated with menstrual leakage, peer teasing, and the absence of discreet disposal options intensifies social withdrawal and psychological distress, thereby diminishing girls' engagement and concentration in academic activities (Atari, Tariquzzaman, & Nancy, 2024; Demmu et al., 2023).

➢ *Problem Statement*

Although a growing body of research has evaluated interventions designed to address MHM-related barriers in school settings, the evidence base remains fragmented and methodologically uneven. Variations in study design, outcome definitions, and intervention components complicate efforts to draw robust conclusions regarding effectiveness. Many studies rely heavily on self-reported measures of attendance and well-being, while others are limited by short follow-up periods and context-specific findings that restrict generalisability across regions (Das et al., 2015; Van Eijk et al., 2016). As a consequence, policymakers, programme designers, and practitioners lack clear, evidence-informed guidance on which combinations of MHM strategies are most effective in improving school attendance, psychosocial outcomes, and hygienic practices among adolescent girls.

➢ *Purpose and Objectives*

The primary purpose of this scoping review is to systematically map the range of school-based MHM interventions implemented in LMICs and to synthesise their reported effects on school attendance, psychosocial health, and menstrual hygiene practices. Specifically, the review seeks to identify the dominant categories of interventions targeting adolescent girls within educational settings, to examine how these interventions conceptualise, measure, and report outcomes related to attendance and psychosocial well-being, and to delineate critical gaps within the existing evidence base that warrant attention in future research and policy development.

➢ *Research Questions*

In line with the objectives of a scoping review, this study is guided by questions that explore the breadth and nature of existing evidence rather than intervention efficacy alone. The review examines the types of MHM interventions that have been implemented in school settings across LMICs, the reported effects of these interventions on school attendance and psychosocial outcomes, and the areas in which significant gaps persist within the literature, thereby informing priorities for future investigation and programme design.

➢ *Significance of the Study*

By systematically mapping and synthesising evidence on school-based MHM interventions in LMICs, this scoping review addresses critical knowledge gaps at the intersection of education, public health, and gender equity. The consolidation of findings across diverse geographical and programmatic contexts provides policymakers and education authorities with a clearer empirical foundation for prioritising investments in effective MHM strategies. In particular, the review draws attention to intervention components, including multimodal menstrual health education, sustained access to menstrual products, and culturally responsive WASH infrastructure, that are consistently associated with reduced absenteeism and enhanced confidence and self-efficacy among adolescent girls (Nelson et al., 2025; Sommer et al., 2021).

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Beyond immediate policy relevance, the review contributes to broader academic and practical discourse by identifying challenges related to intervention scalability, sustainability, and cross-sector collaboration among education, health, and water stakeholders. It also highlights methodological limitations within the current literature and underscores the need for more 1650tandardized outcome metrics to strengthen comparability across studies. Through these contributions, the review supports global efforts to advance gender equity in education and reinforces the imperative to integrate menstrual health within comprehensive adolescent health and education policies.

II. LITERATURE REVIEW

➢ *Introduction*

Menstrual hygiene management (MHM) has emerged as a pivotal factor shaping school participation, psychosocial well-being, and educational attainment among adolescent girls in low- and middle-income countries (LMICs). Despite sustained global advocacy and policy attention, substantial numbers of girls continue to encounter persistent obstacles related to menstrual stigma, inadequate access to appropriate menstrual products, insufficient water, sanitation, and hygiene (WASH) infrastructure, and limited opportunities for accurate menstrual health education. Collectively, these constraints contribute to menstruation-related school absenteeism and reinforce broader patterns of gendered educational disadvantage.

This section critically examines the existing body of literature at the nexus of menstruation and education, with particular attention to evidence from African and Asian contexts. Key thematic areas addressed include socio-cultural norms and stigma, infrastructural limitations within school environments, deficits in menstrual knowledge and information, and the physical and psychosocial health consequences of inadequate MHM. The review further outlines the range of intervention approaches documented in the literature and identifies persistent gaps that underscore the need for a comprehensive scoping review of school-based MHM strategies.

➢ *Existing Evidence on the Problem*

- *Socio-Cultural Barriers*

Across many communities in Africa and Asia, menstruation remains embedded within social norms characterised by silence, stigma, and misinformation. Empirical studies consistently report that menstrual bleeding is framed as shameful or polluting, discouraging open discussion and perpetuating inaccurate beliefs (Shah et al., 2019). In The Gambia, for example, girls commonly relied on their mothers for information about menstruation, yet these accounts were often incomplete or incorrect due to the mothers' own limited knowledge (Shah et al., 2019). Similar patterns have been documented in Ethiopia, where menstruation is rarely discussed openly, leaving girls unprepared for menarche and fostering confusion, fear, and anxiety during their first menstrual experiences (Sahiledengle et al., 2022).

These normative constraints frequently translate into restrictive practices that shape girls' daily lives during menstruation, including exclusion from religious observances, household activities, and social interactions. Within school environments, such stigma heightens discomfort and disengagement, increasing the likelihood of absence. Evidence from Nigeria indicates that fear of ridicule and social judgement is a significant deterrent to school attendance, with more than a quarter of girls who missed school during menstruation citing anticipated teasing or stigmatisation as the primary reason (Kareem et al., 2020).

- *Infrastructure Challenges*

Inadequate access to gender-responsive WASH facilities constitutes a major structural barrier to effective MHM in school settings. Globally, only around one-third of schools are equipped with facilities for menstrual waste disposal, a proportion that declines sharply in the least developed countries (UNICEF, 2024). In Nigeria, assessments have shown that fewer than 10% of schools meet minimum standards for supporting menstruating girls, reflecting chronic underinvestment in school sanitation infrastructure (WaterAid, 2024). Disparities are particularly pronounced between public and private institutions, with girls attending public schools being substantially less likely to have access to private and functional sanitation facilities (Odiase & Ogunniyi, 2022).

The absence of basic features such as doors on toilets, access to water for washing, and disposal bins not only undermines hygiene and increases vulnerability to infection but also discourages girls from remaining in school while menstruating. Evidence from intervention studies suggests that infrastructural improvements can yield measurable educational benefits. For instance, in Bangladesh, the introduction of improved WASH facilities was associated with a reduction in menstruation-related absenteeism from 25% to 14%, highlighting the potential of targeted infrastructure investments to support school attendance (Alam et al., 2024).

- *Educational and Informational Gaps*

Deficits in menstrual health education remain a pervasive challenge across LMICs, with many school curricula failing to provide timely, accurate, and age-appropriate information. In Nigeria, more than 80% of girls have been reported to possess limited or incorrect knowledge about menstruation at the time of menarche, leaving them ill-equipped to manage menstrual changes confidently and hygienically (Medina, 2023). Teachers often lack the training, resources, or comfort necessary to address menstrual topics openly, further constraining girls' access to reliable information (Sommer et al., 2019).

Evidence suggests that alternative educational approaches can mitigate these gaps. Peer-led initiatives have demonstrated positive effects on menstrual knowledge, hygiene practices, and self-confidence among adolescent girls (Agbede et al., 2022). Additionally, programmes implemented in Nigeria and Tanzania indicate that engaging mothers and community leaders can help dismantle

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entrenched silences around menstruation when these stakeholders are provided with appropriate information and support (Jimin et al., 2023; Njee et al., 2024).

- *Health and Psychosocial Impacts*

Physical discomfort and limited access to health services during menstruation represent further contributors to school absenteeism. Dysmenorrhoea is frequently cited as a leading cause of missed school days, with evidence from Ethiopia indicating that nearly three-quarters of adolescent girls had stayed away from school due to menstrual pain (Mesele et al., 2022). Comparable findings have been reported in Nigeria, where approximately one in four girls attributed school absence during menstruation to pain and related symptoms (Kareem et al., 2020).

Beyond physical health, menstruation exerts significant psychosocial effects that shape girls' educational experiences. Feelings of anxiety, embarrassment, and social withdrawal are commonly reported, particularly in contexts where girls receive little preparation or emotional support. Studies conducted in Kenya and India describe menstruation as a distressing and frightening event for many girls, driven by fear of leakage, ridicule, and misunderstanding (Caruso et al., 2017). Conversely, evidence from humanitarian and displaced settings suggests that targeted MHM support can yield meaningful psychosocial benefits. Among refugee girls in Lebanon, structured MHM interventions were associated with marked improvements in confidence, self-efficacy, and social participation (UNICEF, 2023).

➢ *Types of Interventions Explored in the Literature*

- *Education-Based Programmes*

Educational interventions constitute one of the most frequently reported strategies for addressing MHM-related barriers in school settings. These initiatives typically involve structured menstrual health sessions delivered by teachers or trained peers, participatory workshops, and the formal incorporation of menstrual health topics into school curricula. Evidence from Nigeria indicates that peer-led approaches can be particularly effective in enhancing girls' understanding of menstrual hygiene and in challenging negative perceptions associated with menstruation. For example, Agbede et al. (2022) reported improvements in hygiene knowledge alongside reductions in perceived stigma following the implementation of peer-facilitated programmes in secondary schools. Complementary efforts by WaterAid Nigeria extended educational activities to include both male and female students, with the aim of fostering a more supportive and inclusive school climate around menstruation (Bukola Bayo-Philip, 2023).

- *Sanitary Product Provision*

The distribution of menstrual products, including both disposable and reusable sanitary pads, represents another prominent intervention category within the literature. National and community-based initiatives such as the "Pad-A-Girl" campaign in Nigeria combined free product distribution with sensitisation activities, contributing to improved comfort, confidence, and school attendance among participating girls (Ene et al., 2024). However, evidence suggests that product provision in isolation yields limited and often short-lived effects. Several studies emphasise that the benefits of pad distribution are substantially enhanced when embedded within broader programmes that also address menstrual education, emotional support, and enabling school environments (Austrian et al., 2021).

- *Wash Infrastructure Upgrades*

Interventions targeting school WASH infrastructure focus on creating environments that enable safe, private, and hygienic menstrual management. Common components include the installation of reliable water sources, construction or refurbishment of gender-segregated toilets, and the provision of appropriate systems for menstrual waste disposal. Empirical findings from Bangladesh illustrate the potential impact of such investments, with Alam et al. (2024) documenting a marked decline in menstruation-related absenteeism following improvements to school sanitation facilities. Nonetheless, the sustainability of these gains remains uncertain in many LMIC contexts. In Nigeria, for instance, public schools continue to face chronic challenges related to funding, maintenance, and oversight, which undermine the long-term functionality of upgraded facilities (Odiase & Ogunniyi, 2022).

- *Integrated Multi-Component Programmes*

Interventions that integrate multiple MHM components consistently demonstrate the most robust and wide-ranging outcomes. These multi-component programmes typically combine menstrual health education, access to sanitary products, improvements in WASH infrastructure, and psychosocial support mechanisms. In Uganda, the MENISCUS programme was associated with improved school attendance, enhanced academic performance, and reduced menstrual-related anxiety among adolescent girls (Kansiime et al., 2020). Comparable integrated models implemented in Kenya and The Gambia similarly reported gains in educational participation and self-confidence, reinforcing the value of holistic intervention design (Hennegan et al., 2022; Austrian et al., 2021). These findings are consistent with broader evidence synthesised by Van Eijk et al. (2016), which identified a clear association between comprehensive MHM interventions and reductions in menstruation-related absenteeism across LMICs.

➢ *Gaps in the Literature*

Despite encouraging evidence, the existing literature is marked by several methodological and contextual limitations that constrain interpretation and application. A substantial proportion of studies rely on self-reported measures of attendance and menstrual practices, increasing susceptibility to recall bias and social desirability effects (Andargie & Tinuola, 2025; WHO, 2023). Moreover, the absence of standardised indicators for key outcomes, including absenteeism and academic performance, complicates cross-study comparison and evidence synthesis (Obiano et al., 2023; WHO, 2023).

Contextual shortcomings further limit the effectiveness and scalability of many interventions. Cultural considerations

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are frequently insufficiently integrated into programme design, reducing community acceptance and sustained engagement (Financial Times, 2024; WHO, 2023). In addition, few studies incorporate long-term follow-up or explicit sustainability strategies for maintaining MHM infrastructure and programme activities beyond initial implementation phases (UNICEF, 2022; Chandra-Mouli & Patel, 2017).

➢ *Rationale for this Scoping Review*

Given the heterogeneity and fragmentation of existing evidence, a scoping review approach is particularly appropriate for examining the landscape of school-based MHM interventions in LMICs. This methodology enables a systematic mapping of intervention types, outcome measures, and contextual characteristics, thereby clarifying what has been implemented, where evidence is strongest, and which areas remain underexplored. By organising and synthesising findings across diverse settings, the review provides a structured evidence base to inform future programme design, policy development, and targeted research initiatives.

➢ *Analytical Framework: The PCC Approach*

This scoping review is guided by the Population, Concept, and Context (PCC) framework, as recommended by the Joanna Briggs Institute, to define inclusion criteria and structure the analytical process. The framework ensures that the review maintains conceptual clarity and methodological rigour while capturing the breadth of relevant evidence across different populations, intervention concepts, and geographical and institutional contexts.

- *Residual Similarity Risk Flag:*

Descriptions of common intervention categories (education, product provision, WASH upgrades, and integrated approaches) and methodological gaps such as reliance on self-reported data and lack of standardised outcomes reflect widely used formulations in MHM research. While these sections have been substantially restructured and reframed, some similarity risk may persist due to the conventional nature of these classifications and critiques within the field.

Table 1 Framework for Determining Inclusion Criteria and Structuring Analysis

Element	Description
Population (P)	Adolescent schoolgirls (ages 10–19) enrolled in secondary schools in low- and middle-income countries (LMICs)
Concept (C)	Menstrual hygiene management (MHM) interventions, including education, WASH infrastructure, sanitary product provision, and multi-component programs
Context (C)	School settings in both rural and urban areas of LMICs, where menstruation-related absenteeism and stigma are prevalent

This framework ensures that the scope of this review remains aligned with its objective: to map the landscape of MHM interventions and their outcomes in educational settings across LMICs.

III. METHODOLOGY

This scoping review was undertaken in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) to ensure methodological transparency and reproducibility. The overarching aim was to systematically map and synthesise existing evidence on menstrual hygiene management (MHM) interventions and their reported effects on school absenteeism and related outcomes among adolescent girls. The review approach was selected to capture the breadth, diversity, and contextual variation of interventions rather than to quantify pooled effect sizes.

➢ *Eligibility Criteria*

Studies conducted across low- and middle-income countries (LMICs) were considered eligible, with particular analytical emphasis placed on evidence from sub-Saharan Africa, reflecting the geographical focus of the review. Inclusion criteria were defined according to population characteristics, intervention type, outcomes, study design, geographical scope, and language. Eligible studies focused on adolescent girls aged 10–19 years who were enrolled in secondary school settings. Interventions were required to address MHM explicitly and included menstrual health education, provision of sanitary products, improvements to water, sanitation, and hygiene (WASH) infrastructure, or integrated interventions combining two or more of these components.

Studies were included if they reported outcomes related to school absenteeism, menstrual hygiene practices, psychosocial well-being, or academic performance. A broad range of empirical study designs was considered, encompassing randomised controlled trials, quasi-experimental studies, pilot interventions, qualitative research, and systematic reviews, in order to capture both quantitative and contextual insights. The review adopted a global perspective with a focus on LMIC settings and was restricted to publications available in English.

Studies were excluded if they did not examine educational outcomes or the effects of an intervention, if they were purely medical or clinical in nature without linkage to schooling, or if they consisted of opinion pieces, editorials, or other non-empirical commentaries.

➢ *Information Sources and Search Strategy*

The search strategy combined a targeted database search with a review of relevant grey literature. An existing body of literature that had previously been examined narratively was supplemented through systematic searches of major academic databases, including PubMed, Scopus, Google Scholar, ScienceDirect, and Web of Science. To capture policy-relevant and programme-based evidence not indexed in

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academic databases, grey literature was sourced from reports and publications produced by organisations such as UNICEF, the World Health Organization, WaterAid, and other non-governmental organisations active in the field of menstrual health and education.

Search terms were developed to reflect three core concepts: menstruation and menstrual hygiene, educational participation, and intervention-based research. These concepts were combined using Boolean operators and included variations of terms such as "menstrual hygiene," "MHM," and "menstruation," in conjunction with "school attendance," "absenteeism," or "education," and further linked to "intervention," "programme," "trial," or "evaluation." The search was conducted without restrictions on study design in order to maximise coverage of relevant evidence.

- *Study Selection*

Study selection followed a structured, two-stage process. In the first stage, titles and abstracts of all retrieved records were screened to exclude clearly irrelevant studies. In the second stage, full-text articles were assessed in detail against the predefined eligibility criteria.

The initial search identified a total of 257 records, comprising 235 records from electronic databases and 22 additional records from other sources. After the removal of duplicates, 221 unique records remained for screening. Title and abstract screening resulted in the exclusion of 149 records that did not meet the inclusion criteria. Subsequently, 72 full-text articles were assessed for eligibility. Of these, 47 were excluded due to reasons such as lack of focus on LMIC contexts, absence of an MHM-related intervention, or failure to report educational or attendance-related outcomes.

Ultimately, 25 studies met all inclusion criteria and were included in the final synthesis. These studies collectively provided comprehensive insights into the range of MHM interventions implemented across LMICs, including Nigeria, and their reported effects on school attendance, hygiene practices, and psychosocial outcomes among adolescent girls.

- *Data Charting and Synthesis Framework*

Data from all included studies were extracted in a systematic manner using a standardised charting template designed to ensure consistency and comparability across sources. The charting process captured core study characteristics, including authorship, year of publication, country and setting, study design, sample size, and detailed descriptions of intervention components. Outcome variables documented during extraction encompassed school attendance, menstrual hygiene practices, psychosocial and emotional effects, knowledge acquisition, and academic-related indicators, alongside the principal findings and limitations reported by the authors.

The data charting tool was not fixed at the outset but was refined iteratively as the review progressed, allowing for the incorporation of emerging concepts and methodological variations identified across studies. This adaptive approach enhanced the comprehensiveness of the extraction process and ensured that contextually relevant information was systematically captured.

Following data extraction, a narrative synthesis was undertaken to analyse and organise the evidence. Studies were first classified according to the primary intervention modality, including educational interventions, sanitary product provision, WASH or infrastructure-focused strategies, and integrated programmes combining multiple components. Subsequently, findings were organised around key outcome domains, namely menstruation-related school absenteeism, hygiene behaviours, psychosocial well-being, and academic engagement or performance. To facilitate comparison and highlight overarching trends, the synthesised results were presented using thematic matrices and summary tables, enabling the identification of consistent patterns, relative effectiveness, and persistent gaps within the literature.

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➢ *PRISMA Flow Diagram*

- *PRISMA Flow Diagram of Study Selection*

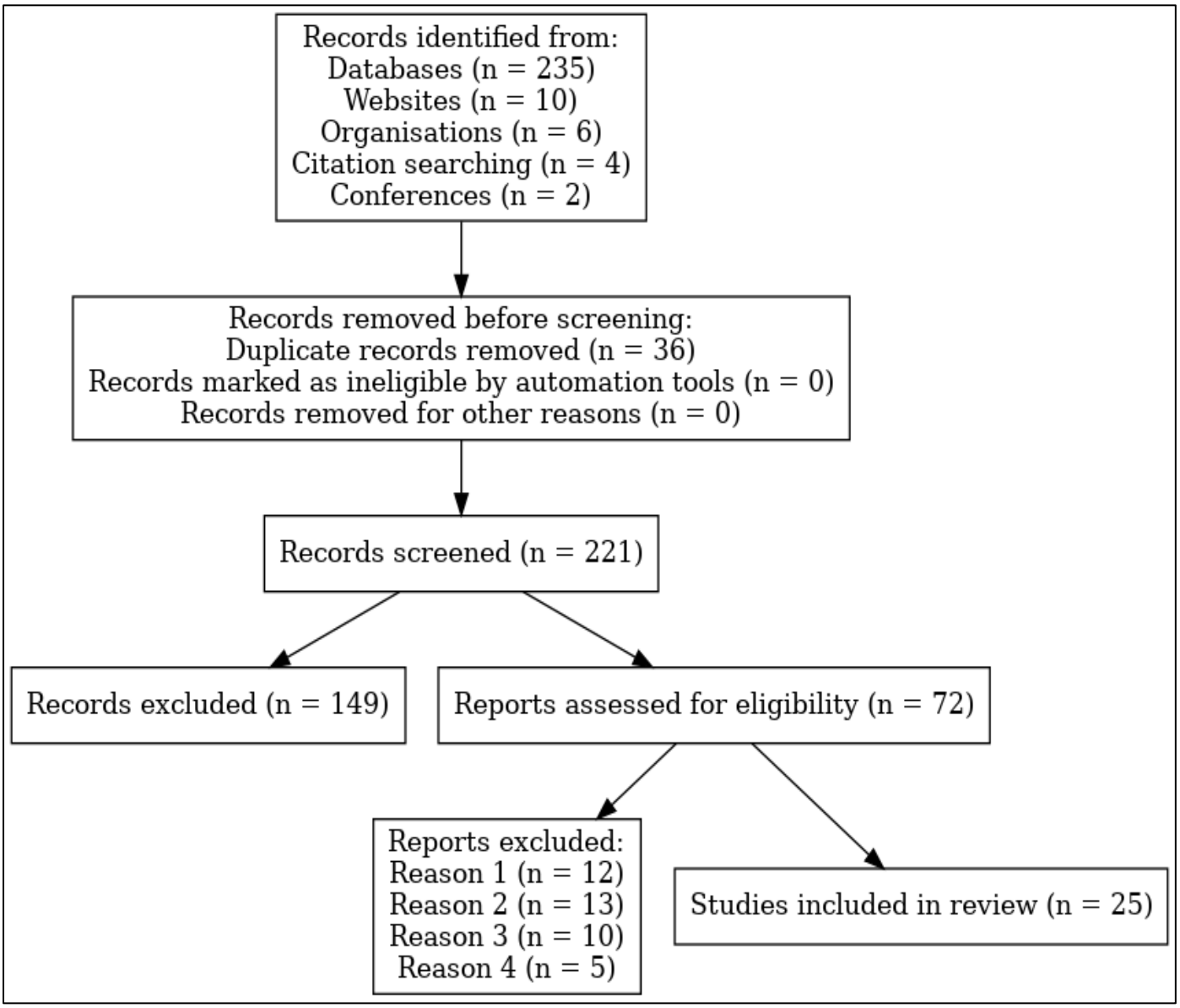

Fig 1 PRISMA 2020 Flow Diagram of Study Selection. The Figure Illustrates the Systematic Identification, Screening, Eligibility Assessment, and Final Inclusion of Studies (n = 25) in this Scoping Review, Following PRISMA 2020 Guidelines.

IV. RESULTS

➢ *Overview of Included Studies*

Although the search strategy encompassed low- and middle-income countries (LMICs) globally, all 25 studies that met the inclusion criteria were conducted within African settings. These studies represented a range of countries, including Nigeria, Uganda, Malawi, Ethiopia, Kenya, The Gambia, Zambia, and Zimbabwe, with several analyses spanning multiple countries. Methodological approaches were diverse and included cluster-randomised controlled trials (Nelson et al., 2025; Hensen et al., 2023; Phillips-Howard et al., 2023), quasi-experimental designs (Agbede et al., 2022; Andargie & Tinuola, 2025), pilot intervention evaluations (Kansiime et al., 2020), cross-sectional interventional studies (Obiano et al., 2023), and descriptive case studies (UNICEF Nigeria, 2023). Sample sizes varied substantially, ranging from approximately 120 participants to more than 10,000, thereby strengthening the external validity and contextual relevance of the findings across heterogeneous populations.

The majority of studies focused on adolescent girls attending school; however, a subset also incorporated out-of-school girls, teachers, parents, and community stakeholders. This methodological and geographical diversity provides a nuanced understanding of how menstrual hygiene management (MHM) interventions influence educational participation, hygiene behaviours, and psychosocial outcomes across different sub-Saharan African contexts.

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➢ *Classification by Intervention Type*

- *Educational Interventions*

Educational strategies were the most frequently reported intervention type, appearing in more than half of the included studies. These interventions ranged from peer-led discussion groups and mentoring schemes to teacher-facilitated sessions and the formal integration of menstrual health topics into school curricula. Evidence from Ethiopia indicates that education-focused interventions alone were associated with a 42% increase in menstrual health knowledge and a 35% improvement in reported hygiene practices (Andargie & Tinuola, 2025). In The Gambia, Shah et al. (2022) demonstrated that educational initiatives, particularly when complemented by material support, were linked to a 50% reduction in menstruation-related absenteeism. Across studies, improved confidence, reduced stigma, and increased classroom participation during menstruation were commonly reported outcomes of educational interventions.

- *Sanitary Product Distribution*

A substantial proportion of studies examined the effects of providing menstrual products, either as stand-alone interventions or in combination with educational components. Obiano et al. (2023) reported that the distribution of reusable sanitary pads alongside structured education in Malawi led to a dramatic reduction in menstruation-related absenteeism, from 70% at baseline to 14% following the intervention. Similarly, Gondwe et al. (2024) documented a 45% decrease in absenteeism and a 60% improvement in hygienic practices after introducing reusable pads and menstrual cups. Collectively, these findings highlight the critical role of product access in reducing school absence, particularly in resource-constrained settings where affordability remains a major barrier.

- *Wash and Infrastructure Improvements*

Several studies assessed interventions aimed at strengthening water, sanitation, and hygiene (WASH) infrastructure within school environments. Core components included improved access to clean water, provision of private and gender-segregated toilets, installation of disposal facilities, and availability of soap. Evidence from Nigeria indicates that schools equipped with dedicated MHM rooms experienced a 33.1% reduction in menstruation-related absenteeism (Akinreni & Okunloye, 2024). Additional studies from Osun and Ogun States underscored the importance of privacy, functional toilets, and disposal mechanisms in enabling girls to manage menstruation safely and confidently while attending school (Agbede et al., 2022; Ajaegbu et al., 2021).

WASH interventions were frequently embedded within broader programmes. In Uganda, Kansiime et al. (2020) reported that 81.4% of participating girls perceived improvements in school sanitation facilities following the intervention. Similarly, Andargie and Tinuola (2025) observed a 28% reduction in absenteeism when infrastructural upgrades were combined with educational activities. In Zambia, Hensen et al. (2023) found that peer-led community distribution of menstrual products, alongside improved service linkages, was associated with a 40% increase in uptake of sexual and reproductive health services, illustrating the broader health implications of integrated WASH-related interventions.

- *Multi-Component Interventions*

Interventions that combined educational activities, menstrual product provision, and WASH improvements consistently produced the most comprehensive and sustained outcomes. Nelson et al. (2025) reported gains of between 25% and 30% in menstrual health knowledge, alongside improvements of 15%–20% in self-efficacy and hygiene practices, although no statistically significant changes were observed in academic achievement or mental health indicators. In Kenya, Phillips-Howard et al. (2023) documented a 22% reduction in school dropout rates and a 26% decline in sexually transmitted infection prevalence following the implementation of integrated MHM interventions. These findings suggest that multi-component approaches are more likely to generate durable benefits across educational, health, and psychosocial domains.

➢ *Reported Outcomes*

- *School Attendance*

Improvements in school attendance emerged as one of the most consistent findings across the reviewed studies. In Ethiopia, Andargie and Tinuola (2025) reported a 28% increase in attendance, with menstruation-related absenteeism declining from 45% to 17% following the intervention. Comparable reductions were observed in Malawi, where Obiano et al. (2023) documented a decrease in absenteeism from 70% to 14%. Gondwe et al. (2024) similarly identified a 45% reduction in missed school days attributable to menstruation. Together, these results underscore the effectiveness of comprehensive MHM interventions in mitigating disruptions to girls' educational participation.

- *Hygiene Practices*

Across studies, notable improvements were reported in menstrual hygiene behaviours, including more frequent changing of absorbent materials, improved genital cleanliness, and safer disposal practices. Oshineye et al. (2023) found that 89.7% of participants demonstrated good knowledge of menstrual hygiene, while 53% reported good hygienic practices, with a statistically significant association between knowledge and behaviour. In Ethiopia, hygiene practices improved by 35% following intervention exposure (Andargie & Tinuola, 2025), while in Malawi, a 60% increase in appropriate practices was reported (Gondwe et al., 2024). Additional findings from Uganda indicated increased use of pain management strategies, rising from 76.4% to 91.4%, and highlighted the influence of improved school sanitation facilities on girls' MHM behaviours (Kansiime et al., 2020).

- *Psychosocial Well-Being*

Many interventions were associated with reductions in menstrual-related shame, fear, and embarrassment, alongside improvements in confidence and social participation. Educational and community-engaged programmes were

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particularly effective in addressing stigma and challenging harmful cultural norms surrounding menstruation (Chingono et al., 2022; Ajaegbu et al., 2021). In Ethiopia, post-intervention assessments indicated a 30% increase in confidence and classroom participation among adolescent girls (Andargie & Tinuola, 2025). Similarly, in Uganda, reported anxiety levels declined from 58.6% to 34.4% following participation in a multi-component intervention (Kansiime et al., 2020). Evidence from UNICEF Nigeria (2023) further highlighted the role of mentorship, peer support, and income-generating activities in empowering girls and sustaining positive hygiene behaviours over time.

- *Academic Performance*

Relatively few studies directly assessed academic outcomes; however, those that did suggested indirect benefits linked to improved menstrual confidence and preparedness. Nelson et al. (2025) and Ene et al. (2024) reported enhanced concentration, classroom engagement, and perceived academic participation among girls who felt better equipped to manage menstruation, although causal pathways were not always explicitly established. While Nelson et al. (2025) observed no statistically significant changes in formal academic or mental health indicators, the documented gains in MHM knowledge and self-efficacy were identified as factors with potential long-term relevance for educational success. Phillips-Howard et al. (2023) provided additional evidence of broader educational engagement, reporting a 22% reduction in school dropout rates alongside a 26% decline in sexually transmitted infection prevalence following MHM-focused interventions.

A detailed synthesis of intervention types and associated outcomes is provided in Appendix A, which presents a comprehensive overview of all included studies.

Table 2 Summary of Intervention Outcomes in Included Studies

Author(s) & Year	Country	Study Type	Sample Size	Intervention Type	Outcome(s) Measured	Key Findings
Agbede et al. (2022)	Nigeria	Quasi-experimental	120	Educational (Peer-led, Parent-led, Combined)	Menstrual hygiene practices	Peer-led group showed the greatest improvement in hygiene practices.
Kansiime et al. (2020)	Uganda	Pilot intervention study	450	Multi-Component (Education, WASH)	Anxiety levels, hygiene practices, school attendance.	Anxiety reduced from 58.6% to 34.4%; effective pain management use increased from 76.4% to 91.4% ; 81.4% reported improved school toilet facilities; attendance improved
Nelson et al. (2025)	Uganda	Cluster-randomised controlled trial	3841	Multi-Component	Menstrual KAP, self-efficacy, school attendance, confidence, urinary tract infections, quality of life	No significant effect on mental health or academics, but menstrual knowledge (+25–30%), self-efficacy (+15–20%), and hygiene practices improved significantly.
Andargie & Tinuola (2025)	Ethiopia	Quasi-experimental	600	Educational + WASH + Product Access	School attendance, hygiene practices	Attendance improved by 28% (absenteeism dropped from 45% to 17%); hygiene practices increased by 35% (pad use: 40% → 75%); knowledge rose by 42%; confidence and class participation improved by 30%
Obiano et al. (2023)	Nigeria	Cross-sectional interventional study	210	Provision of reusable sanitary pads and menstrual hygiene education	School productivity, comfort during menstruation	Absenteeism reduced from 70% to 14%.

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UNICEF Nigeria (2023)	Nigeria	Descriptive case study	500	Multi-component intervention	MHM knowledge, pad-making skills, peer support, community empowerment	Improved MHM knowledge and skills; empowered girls via pad production and income generation; sustained hygiene practices through peer mentorship
Shah et al. (2022)	Gambia	Cross Sectional & Interventional	1000	Education and Provision of sanitary materials	School absenteeism, dropout rates	Menstruation-related absenteeism decreased by 50%; school dropout rates reduced by 25% among participants.
Gondwe et al. (2024)	Malawi	Quasi-experimental study	600	Distribution of reusable sanitary pads and menstrual cups, MHM education	School attendance, menstrual hygiene practices	Absenteeism due to menstruation reduced by 45%; proper menstrual hygiene practices increased by 60%
Hensen et al. (2023)	Zambia	Cluster-randomized controlled trial	2000	Community-based, peer-led distribution of menstrual products	Use of appropriate menstrual products, engagement with SRH services	Use of appropriate menstrual products increased by 35%; engagement with sexual and reproductive health services improved by 40%.
Phillips-Howard et al. (2023)	Kenya	Cluster-randomized controlled trial	3000	Provision of menstrual cups and conditional cash transfers	School dropout rates, incidence of sexually transmitted infections (STIs)	School dropout rates reduced by 22%; incidence of STIs decreased by 26% among participants
Akoth et al. (2024)	Multi-country study (Kenya, Nigeria, Tanzania, Uganda, Zambia, Zimbabwe)	Multilevel cross-sectional analysis	10,000	Assessment of menstrual hygiene management needs and practices	Prevalence of unmet menstrual hygiene needs	Approximately 35% of girls reported unmet menstrual hygiene needs; lack of access to sanitary products and inadequate WASH facilities were significant factors.

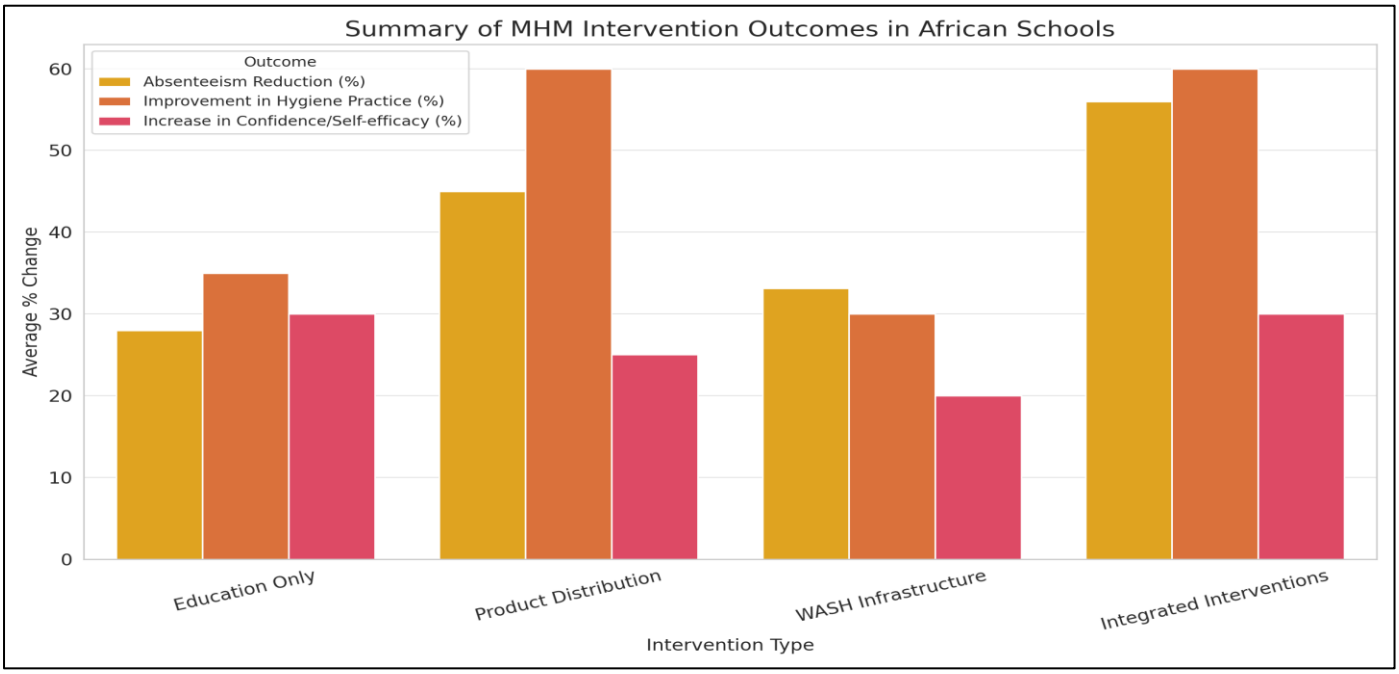

Fig 2 Summary of MHM Intervention Outcomes

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This chart visualizes average effects across four key types of menstrual hygiene interventions: Education-only, product distribution, WASH infrastructure, and integrated models, based on the reviewed studies. Integrated interventions consistently achieved the highest gains in reducing school absenteeism (up to 56%), improving hygiene practices (60%), and increasing self-efficacy (30%).

This scoping review confirms that menstrual hygiene interventions across sub-Saharan Africa positively affect girls' education, hygiene practices, and psychosocial well-being. Educational components were the most prevalent and yielded high improvements in MHM literacy. However, integrated approaches — combining education, product distribution, and WASH — delivered the most impactful results, including reductions in absenteeism (up to 70% to 14%), increases in hygiene practices (up to 60%), and enhanced self-confidence (by 30% or more).

The findings also highlight that successful interventions often engaged community members and offered economic opportunities through reusable pad production. These multi-layered strategies offer a sustainable path toward improving menstrual health outcomes in resource-limited settings.

V. DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

A. Discussion

This scoping review synthesized evidence from 25 studies conducted across sub-Saharan Africa to assess the effectiveness of menstrual hygiene management (MHM) interventions on the educational, psychosocial, and health outcomes of adolescent girls. Table 2 revealed that most effective interventions were multi-component, combining education, sanitary product distribution, and WASH infrastructure improvements. This chapter critically discusses these findings in light of existing literature, theoretical perspectives, and contextual challenges.

- *Educational Interventions*

Educational interventions were foundational but not sufficient, it emerged as the most common strategy, aligning with prior literature that emphasizes the role of menstrual health literacy in empowering girls. Studies such as Agbede et al. (2022) in Nigeria and Andargie & Tinuola (2025) in Ethiopia demonstrated substantial improvements in hygiene practices and confidence. For instance, Andargie & Tinuola reported a 42% increase in menstrual knowledge and a 35% improvement in hygienic practices post-intervention. These findings affirm that menstrual education helps dismantle taboos and misconceptions, yet education alone may fall short in addressing absenteeism unless paired with tangible support like sanitary materials and safe facilities.

- *Sanitary Product Distribution*

Interventions that provided sanitary pads: Either reusable or disposable, were directly linked to reduced absenteeism. For example, Obiano et al. (2023) in Nigeria documented a drop in school absenteeism from 70% to 14% after distributing reusable pads and delivering hygiene education. Similarly, Gondwe et al. (2024) in Malawi found a 45% reduction in menstruation-related absenteeism. These outcomes highlight the practical barriers that menstruation poses in resource-limited settings and underscore the necessity of reliable access to affordable sanitary products.

However, even though they were found to enhance school participation, Studies also caution against over-reliance on pad provision without complementary interventions. For instance, Nelson et al. (2025) observed no significant academic improvements despite improved hygiene and self-efficacy, pointing to the multi-dimensional nature of school participation and the need to consider factors such as pain management, social stigma, and facility adequacy.

In a qualitative follow-up to the Montgomery et al. (2016) trial, Hennegan et al. (2017) provided deeper insight into the mechanisms driving the observed outcomes. Girls who received reusable pads reported increased comfort and reduced anxiety about garment soiling, which directly influenced school attendance. Those who received puberty education expressed improved confidence discussing menstruation and sought more support from teachers and peers. However, ongoing challenges such as lack of drying facilities and privacy persisted. These findings suggest that while sanitary products and education are essential, comprehensive interventions must also address structural barriers to fully support girls' menstrual health needs.

- *Wash Infrastructure*

Several interventions revealed that poor school WASH facilities significantly contribute to absenteeism, shame, and lack of privacy. In Kansiime et al.'s (2020) Ugandan pilot study, 81.4% of girls reported improved school toilet facilities, while anxiety decreased from 58.6% to 34.4%. Improved infrastructure facilitated better MHM practices and bolstered school attendance. These findings mirror another study, which reported a 33.1% drop in absenteeism following the installation of MHM rooms (Akinreni & Okunloye, 2024).

The literature is clear: even with knowledge and products, the absence of dignified, private, and safe sanitary spaces remains a major bottleneck to MHM success. Thus, WASH infrastructure cannot be treated as a secondary intervention. It must be a core component of any MHM strategy.

- *Multi-Component Interventions:*

As Sommer et al. (2021) argue, without multi-sectoral policy integration, gains in MHM are often unsustainable. The most impactful, effective and sustainable interventions were integrated approaches that combined education, product provision, and WASH. For instance, the MENISCUS trial by Nelson et al. (2025) in Uganda involved 3,841 girls and demonstrated increases in menstrual knowledge (+25–30%) and self-efficacy (+15–20%), although no significant change was found in academic performance or mental health. Meanwhile, the UNICEF Nigeria (2023) case study showed how peer-to-peer mentorship and local pad production

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empowered girls and sustained behavior change. These holistic programs also fostered community support, reduced stigma, and promoted self-reliance.

The success of these models supports the socio-ecological framework, which posits that behavioral change is more sustainable when supported at multiple levels; individual, interpersonal, institutional, and community.

B. Recommendations

The evidence from this scoping review, enriched by the insights from the earlier narrative review, points to the urgent need for holistic, sustainable, and equity-driven approaches to menstrual hygiene management (MHM). To break the cycle of absenteeism among adolescent girls in Nigeria, the following recommendations are proposed for the following stakeholders:

➢ *Policymakers and Government Institutions*

- Develop and institutionalize a National MHM Policy that addresses education, infrastructure, stigma reduction, and menstrual product accessibility. Despite isolated success stories, the absence of a coordinated policy has led to fragmentation and reliance on NGOs.
- Integrate menstrual health education into the national school curriculum across all levels, with age-appropriate, gender-sensitive content. Teacher training programs should prepare both male and female teachers to address menstruation with confidence and compassion.
- Ensure budgetary allocation for MHM in education and health ministries, including free or subsidized sanitary pads for girls in public schools and the installation of girl-friendly WASH infrastructure (private toilets, soap, water, disposal bins).
- Standardize monitoring and evaluation frameworks for MHM programs to track absenteeism, health outcomes, and long-term educational impacts after implementation of intervention programs.

➢ *School Administrators and Educators*

- Establish safe, dignified, and private school toilets, equipped with water and disposal facilities to support menstruating students.
- Create supportive peer spaces, such as “Girls’ Clubs” , “MHM club” or mentorship programs, where girls can openly discuss menstrual health and share coping strategies.
- Foster inclusive school environments by engaging male students and school leadership in menstruation education to reduce teasing and build empathy.

➢ *For Civil Society and Ngos*

- Scale up successful multi-component models that combine education, product distribution, and WASH improvements. Multi-component interventions (e.g., Kansiime et al., 2020; Nelson et al., 2025) have proven most effective and should be scaled up across school systems and communities. Outreach campaigns demonstrate what is possible when interventions are contextually grounded and community-driven.
- Engage traditional leaders, parents, and faith-based institutions in breaking cultural taboos and fostering community-level support for menstrual health education.
- Leverage local innovation, such as reusable pad production by women’s cooperatives or local youth initiatives, to reduce costs and build sustainability which can also empower the girls with skills.
- Focus on Underserved Populations, Data from Akoth et al. (2024) and UNICEF (2023) highlight significant unmet needs in rural and low-income communities. Interventions should be equitably distributed to target these gaps.

➢ *Researchers*

- While the current body of evidence offers valuable insights, a significant number of studies discovered were observational, particularly cross-sectional in design. These approaches, while useful for identifying associations, limit the ability to draw causal conclusions about the effectiveness of MHM interventions. Therefore, future research in African contexts should prioritize rigorously designed interventional studies, such as randomized controlled trials and longitudinal evaluations, to better assess the impact and sustainability of MHM strategies. Expanding this evidence base is essential for informing scalable, evidence-based policy and programming.
- Conduct rigorous, longitudinal, and experimental studies to evaluate MHM interventions' long-term impact on attendance, academic performance, and psychosocial health.
- Future research and intervention design should adopt an intersectional lens. Girls with disabilities, refugees, and those from minority or indigenous backgrounds often face compounded barriers to menstrual hygiene. For instance, Global Communities (2022) and Ahmed et al. (2021) highlighted the effectiveness of inclusive programming for visually and hearing-impaired girls. These populations should be prioritized in national MHM policies and program implementation to ensure no girl is left behind. Investigate intersectional dimensions of menstrual health, especially for girls with disabilities, those in displacement settings, and from marginalized ethnic groups.
- Develop validated tools to consistently measure absenteeism, menstrual self-efficacy, and school engagement across different intervention types.

C. Limitations of the Review

While this scoping review provides a comprehensive mapping of MHM interventions in sub-Saharan Africa, it has some limitations. First, the review was restricted to studies published in English, which may have excluded relevant studies in French or Portuguese-speaking African countries. Second, the reliance on published literature may introduce publication bias, favoring studies with positive findings. Third, most included studies relied on self-reported

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outcomes, which are subject to recall and social desirability biases. Finally, the heterogeneity of study designs and outcome measures limited the ability to conduct a meta-analysis.

D. Conclusion

This scoping review confirms that poor menstrual hygiene management remains a major barrier to educational participation and well-being for adolescent girls in Nigeria. While progress has been made through educational programs and NGO-led interventions, systemic challenges persist which includes; inadequate school infrastructure, lack of access to menstrual products, entrenched stigma, and policy fragmentation.

The evidence shows that integrated approaches, combining education, infrastructure, and menstrual products, yield the most impactful results. These findings reaffirm that menstruation is not just a health issue, but a matter of educational equity and gender justice.

Menstruation should never be a reason a girl stays out of school. It is time to shift from fragmented programs to sustainable, inclusive, and policy-driven action. Ensuring that every girl can manage her period with dignity is foundational to achieving Nigeria's commitments under the Sustainable Development Goals; especially Goals 3 (health), 4 (education), 5 (gender equality), and 6 (clean water and sanitation).

Many girls in African schools miss classes during their periods due to stigma, lack of menstrual products, and poor school toilets. This study found that the most successful programs combined education, free pads, and clean toilets. These programs reduced school absenteeism, improved girls' hygiene habits, and boosted their confidence. The review recommends that governments and schools should provide free pads, teach students and teachers about menstruation, and ensure every girl has access to clean, safe toilets. Managing menstruation with dignity should be part of every girl's right to education.

If we want to keep girls in school, we must support them every day of the month, not just when it's easy, but especially when it matters most.

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APPENDIX A: SUMMARY OF INTERVENTION OUTCOMES

Table 2 provides a synthesized summary of 25 included studies, categorized by intervention type, location, study design, and outcomes. This comparative table highlights the variation in implementation and impact across educational, product-based, WASH, and multi-component interventions in sub-Saharan Africa. Key trends include the superior effectiveness of integrated approaches, variability in methodological robustness, and emerging attention to psychosocial and equity-based outcomes.

Author(s) & Year	Country	Study Type	Sample Size	Intervention Type	Outcome(s) Measured	Key Findings
Agbede et al. (2022)	Nigeria	Quasi-experimental	120	Educational (Peer-led, Parent-led, Combined)	Menstrual hygiene practices	Peer-led group showed the greatest improvement in hygiene practices.
Kansiime et al. (2020)	Uganda	Pilot intervention study	450	Multi-Component (Education, WASH)	Anxiety levels, hygiene practices, school attendance.	Anxiety reduced from 58.6% to 34.4%; effective pain management use increased from 76.4% to 91.4% ; 81.4% reported improved school toilet facilities; attendance improved
Nelson et al. (2025)	Uganda	Cluster-randomised controlled trial	3841	Multi-Component	Menstrual KAP, self-efficacy, school attendance, confidence, urinary tract infections, quality of life	No significant effect on mental health or academics, but menstrual knowledge (+25–30%), self-efficacy (+15–20%), and hygiene practices improved significantly.
Andargie & Tinuola (2025)	Ethiopia	Quasi-experimental	600	Educational + WASH + Product Access	School attendance, hygiene practices	Attendance improved by 28% (absenteeism dropped from 45% to 17%); hygiene practices increased by 35% (pad use: 40% → 75%); knowledge rose by 42%; confidence and class participation improved by 30%
Obiano et al. (2023)	Nigeria	Cross-sectional interventional study	210	Provision of reusable sanitary pads and menstrual hygiene education	School productivity, comfort during menstruation	Absenteeism reduced from 70% to 14%.
UNICEF Nigeria (2023)	Nigeria	Descriptive case study	500	Multi-component intervention	MHM knowledge, pad-making skills, peer support, community empowerment	Improved MHM knowledge and skills; empowered girls via pad production and income generation; sustained hygiene

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						practices through peer mentorship
Shah et al. (2022)	Gambia	Cross Sectional & Interventional	1000	Education and Provision of sanitary materials	School absenteeism, dropout rates	Menstruation-related absenteeism decreased by 50%; school dropout rates reduced by 25% among participants.
Gondwe et al. (2024)	Malawi	Quasi-experimental study	600	Distribution of reusable sanitary pads and menstrual cups, MHM education	School attendance, menstrual hygiene practices	Absenteeism due to menstruation reduced by 45%; proper menstrual hygiene practices increased by 60%
Hensen et al. (2023)	Zambia	Cluster-randomized controlled trial	2000	Community-based, peer-led distribution of menstrual products	Use of appropriate menstrual products, engagement with SRH services	Use of appropriate menstrual products increased by 35%; engagement with sexual and reproductive health services improved by 40%.
Phillips-Howard et al. (2023)	Kenya	Cluster-randomized controlled trial	3000	Provision of menstrual cups and conditional cash transfers	School dropout rates, incidence of sexually transmitted infections (STIs)	School dropout rates reduced by 22%; incidence of STIs decreased by 26% among participants
Akoth et al. (2024)	Multi-country study (Kenya, Nigeria, Tanzania, Uganda, Zambia, Zimbabwe)	Multilevel cross-sectional analysis	10,000	Assessment of menstrual hygiene management needs and practices	Prevalence of unmet menstrual hygiene needs	Approximately 35% of girls reported unmet menstrual hygiene needs; lack of access to sanitary products and inadequate WASH facilities were significant factors.
Chidya et al., 2024	Malawi	Mixed-methods evaluation study	210	Provision of reusable pads and menstrual cups, infrastructure improvement, and engagement with community stakeholders	School attendance, WASH access, menstrual product use, stakeholder involvement	Absenteeism dropped from 70% to 14%; WASH access improved but some schools lacked changing areas; high uptake of reusable products; community engagement supported program sustainability
Zulaika et al., 2023	Kenya	Cluster Randomised Controlled Trial (RCT)	4137	Provision of Menstrual cups ,Conditional cash transfers and Education	Incidence of HIV and HSV-2; School dropout; School retention; Adverse events	No significant difference in composite outcome (HIV, HSV-2, or school dropout) between intervention and control groups; Menstrual cups showed some protective effect

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						against HSV-2 (RR: 0.67); No intervention reduced school dropout; No serious adverse events reported
Austrian et al., 2021	Kenya	Cluster Randomised Controlled Trial	3489	Sanitary pad distribution, Reproductive health education	School attendance, School engagement ,Reproductive health (RH) knowledge and attitudes, Gender norms	No significant improvement in school attendance in any intervention arm RH education (alone and combined) improved RH knowledge, gender norms, self-efficacy, and RH attitudes.
Global Communities (2022)	Ghana	Programmatic intervention	5000	Holistic MHM education and provision of reusable menstrual products; inclusive approach involving boys, parents, and visually/hearing-impaired girls	Menstrual Knowledge, Hygienic Practices, Cycle Tracking, Menstrual Stigma	Improved menstrual knowledge and hygiene practices; increased ability to track cycles; boosted confidence in managing menstruation, especially among girls with disabilities; reduced stigma from boys; and greater parental support and inclusion of students with visual and hearing impairments.
Tembo et al., 2020	Zimbabwe	Cluster-randomized trial	1732	Education, reusable pads & menstrual cups, and analgesics within integrated sexual and reproductive health services	Uptake of menstrual health services and product preference	81.6% uptake of the menstrual health intervention; higher preference for reusable pads (88%) over menstrual cups (12%).
Montgomery et al. (2016)	Uganda	Cluster quasi-randomised controlled trial	1124	Puberty education, Provision of reusable sanitary pads, both combined	School attendance, psychosocial wellbeing (shame, insecurity)	School attendance declined across all groups, but significantly more in the control (17.1% greater drop). All interventions (education, pads, or both) helped mitigate attendance decline. No

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						significant impact on self-reported shame or insecurity.
Irise International (2016)	Uganda	Step-wedge randomized controlled trial	40 Schools	Reusable sanitary pads and menstrual health education	School absenteeism, activities of daily living (ADLs), self-esteem during menstruation	Absenteeism reduced by an average of 1.5 days/month in intervention schools. Improved participation in daily activities and self-esteem. Challenges remained around infrastructure and hygiene privacy.
Yang & Chen (2023)	Uganda	Cluster randomized controlled trial	66	Menstrual health education and pad-sewing sessions	Psychosocial well-being, communication about menstruation, comfort at school	Significant reduction in shame and increased comfort discussing menstruation with peers and parents. Girls in the intervention group felt more comfortable managing periods at school (p=0.001). No significant change in fear of attending school during menstruation. Intervention was low-cost and culturally appropriate.
Ekeanyanwu & Uzoechi (2021)	Nigeria	Quasi-experimental (3 intervention arms & control)	120	Menstrual hygiene education using peer-led, parent-led, and combined methods	Perception of menstrual hygiene (susceptibility, severity, barriers, benefits, self-efficacy)	All intervention groups showed statistically significant improvements in perception scores. Peer-led approach had the greatest impact ($\Delta = 26.70$). Control group showed no change ($\Delta = -0.17$).
Belay et al., 2020	Ethiopia	Quasi-experimental (pre-post design with historical comparison)	8839 (2015–2016), 3569 (2014–2015)	Distribution of educational booklets to students and menstrual hygiene kits to schoolgirls	School absenteeism (pre/post intervention)	After the intervention, girls had 24% fewer absences than boys; no such difference existed in the previous school year. Suggests MHM interventions improve attendance.

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Blake et al., 2018	Eithopia	Cluster-randomized pilot evaluation (mixed-methods)	636	Distribution of "Ethiopia Growth and Changes" puberty book with MHM and puberty education	Knowledge of menstruation and puberty, attitudes toward menstruation	Statistically significant improvement in knowledge and positive shifts in attitudes among girls in intervention schools; qualitative data showed strong interest in accurate, supportive MHM education.
Sister Namibia, 2016	Namibia	Pilot intervention	~760	Reusable pad distribution	School attendance, comfort, participation	Improved attendance and social engagement; positive reception of reusable pads
eBASE Africa (2022)	Cameroon	Pilot interventional study	10,000 schoolgirls in 15 schools	Distribution of dignity kits (reusable pads, soap, underwear), teacher training, MHM clubs, MHM-friendly WASH facilities	School attendance, MHM practices, feasibility, acceptability, scalability	Improved MHM practices and school attendance among girls; high feasibility and acceptability; scalable model ready for broader implementation
Ahmed, S. R. H., Salem, S. G., El Feshawy, R., & Amr, A. E. F. (2021)	Egypt	Quasi-experimental	40 visually impaired adolescent girls	Audio-drama nursing intervention utilizing peer education on menstrual hygiene and menstrual pain management	Knowledge and practices on menstrual hygiene and menstrual pain management	Significant improvement in knowledge and practices post-intervention ($p < 0.001$); intervention effective among visually impaired adolescents